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“A problem cannot be solved at the same level as it has been created”

– Albert Einstein

”In the Forest, however, problems somehow do not seem as complex or the consequences as serious as those we face. Besides, in the Hundred Acre Wood, there is always the comforting thought that Christopher Robin will come along to set things straight if All Else Fails.

In our society, we can’t always count on a Christopher Robin standing in the wings waiting to help. We need to rely on our own and our collective talents, abilities, and resources. Excellent managers are needed, and the need will be even greater in the future.”



Pp. 160-161 in:

Allen, R.A. 1995. Winnie-the-Pooh on management. (In which a Very Important Bear and his friends are introduced to a Very Important Subject).

PREFACE AND ACKNOWLEDGMENTS

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Tampere, 19th of March 2004,

Osmo T. Seppälä

Seppälä, O.T. 2004. Visionary management in water services: Reform and development of institutional frameworks. Tampere University of Technology. Publications 457. 300 p.

ABSTRACT

Inadequate access to or lack of safe water and improved sanitation services in the developing countries are one of the world's biggest challenges. Despite increased global attention and extensive advocacy efforts, the problems are likely to worsen in the future, if business-as-usual prevails. Problems related to investments, operations and maintenance of water and sanitation services in developing countries are complex and interlinked. Achievement of the challenging Millennium Development Goals in water and sanitation requires novel application of systemic and visionary approaches. Problems are rooted in the poor institutional arrangements of the water and sanitation sector, while solutions can be achieved only through concerted and coordinated efforts between several segments of the society.

The objective of this research was to develop systemic and visionary methodologies for (i) applying a proactive approach to water policy and institutional reform implementation, (ii) improving long-term visionary management in water sector organisations, and (iii) introducing an alternative visionary approach for development assistance planning and implementation.

This research is based on five international peer-reviewed articles on the perceived key elements of sustainable and viable water and sanitation services and the enabling institutional frameworks. These key elements and the articles are related to (i) effective water and sanitation policy reform implementation, (ii) appropriate stakeholder roles and public-private co-operation in water and sewerage services, (iii) effective economic instruments, financing, pricing and cost recovery in water services, (iv) customer-orientation and customer-responsive water and sanitation services, and (v) visionary leadership and knowledge management in water services. Effective governance, viability and effectiveness of organisations and institutional arrangements are essential cross-cutting issues for sustainable water and sanitation services.

Traditional – mainly economic – development theories do not fully explain complex problems or provide sustainable solutions. The institutional economics approach together with a combination of diverse institutional, organisation, management and leadership theories gives a better conceptual understanding of the complex problem situation of the water and sanitation services sector in developing countries. The ontology and epistemology of futures research provide a proactive and systemic approach to deal with the growing challenges of future water and sanitation services.

The hypotheses of this research, and the findings of the peer-reviewed articles, were tested by several Delphi surveys and interviews among international experts. The expert argumentation confirmed that policies and strategies of both external support agencies and developing countries have often been based on too narrow and fashionable approaches, and thus they have not been adequately holistic and comprehensive. Recently policies and strategies have substantially improved, but their effective implementation in the field still meets several constraints and is often unsuccessful.

Many countries are currently carrying out reforms in their water and sanitation sector, including policy renewal and restructuring of legislation and administrative arrangements. However, these reform processes are too often led and dominated by external support agencies and foreign experts, while local participation is inadequate especially at the practical implementation levels. Policy and reform processes should be tailored to specific local conditions, because there is no universal success model. Also, involvement and

commitment of various stakeholders from the inception of the reform process is essential for successful implementation. Especially customers and other direct and indirect stakeholders have often been sidelined in the reform process.

Privatisation and increased private sector participation have been presented as a global panacea for higher efficiency of water and sanitation services management as well as for mobilisation of unlimited resources. The debate on the merits of public versus private ownership and management has continued heated, although usually with inadequate scientific evidence and unjustified argumentation. It is obvious that institutional and management options in water and sanitation services should be designed on the basis of specific local circumstances. There are a diversity of good options, including both public and private management and their combinations. This diversity should be maintained, instead of pushing for standard solutions from developed countries.

Viability of water and sanitation services in developing countries is still constrained by inadequate financial resources and cost recovery. Inappropriate tariff policies have in the past been one of the key reasons for poor mobilisation of resources, but inefficiencies in management procedures of water utilities and their customer management systems have further aggravated problems. Increasing the autonomy of public water utilities and reforming their management systems is a challenging task, but in many cases a more sustainable solution than replacing inefficiently performing public utilities with private operators.

Urban water and sanitation utilities in developing countries have traditionally operated in a supply-driven manner. They need to improve their customer orientation into a more customer-responsive direction – recognising the emerging role of customers as important stakeholders in the services chain. Rural water systems in developing countries have a long experience of community management, which could provide useful lessons for improving the role of customers and citizens with respect to urban water and sanitation utilities.

Water and sanitation utilities have in general been rather conservative in their management practices and have usually not applied long-term visionary approaches in their management. Visionary management tools and practices – based on futures research methodologies – will be increasingly needed both at the policy-making level and operational water utility level both in developing and industrialised countries. A visionary approach to policy and institutional reform is needed to unveil the uncertainties related to implementation and to assess potential impacts of the reform process. This dissertation emphasises an integrated approach of visionary management, combining scenario techniques and strategic management tools.

This integrated methodology was tested in a case study on the water sector reform process in Kenya, which was started in the late 1990s. The reform aims at defining and clarifying the key roles and functions of organisations in water resources management and service provision. This research reveals the serious inadequacies in the institutional arrangements and recommends improved structures that better fulfil the principles of good governance. In general, the experiences from the visionary approach and methodology in the case study on Kenya were positive, and the approach should be further developed and utilised during the ongoing reform process in Kenya and elsewhere. It is recommended that visionary management tools should also be applied to planning and implementing development assistance interventions.

Key words: water services, water management, visionary management, futures research, scenario techniques, strategy process, viability, management options, institutional development, institutional arrangements, institutional frameworks, reform, organisation, leadership.

Seppälä, O.T. 2004. Vesihuoltopalvelujen visionäärinen kehittäminen. (Visionary management in water services: Reform and development of institutional frameworks). Tampereen teknillinen yliopisto. Julkaisu 457. 300 s. (Alkuperäinen englanniksi).

TIIVISTELMÄ

Riittämättömät vesihuolto- ja sanitaatiopalvelut kehitysmaissa ovat maailman suurimpia haasteita. Huolimatta kasvaneesta maailmanlaajuisesta mielenkiinnosta ja mittavista toimenpiteistä tietoisuuden edistämiseksi nämä ongelmat todennäköisesti vain pahenevat tulevaisuudessa, mikäli toiminta jatkuu entisellään. Kehitysmaiden vesihuollon ja sanitaation parantamiseen liittyvät ongelmat ovat luonteeltaan kompleksisia ja monitieteisiä. Haasteellisten ns. vuosituhattavoitteiden saavuttaminen edellyttää, että omaksutaan uusia kokonaisvaltaisia, systeemisiä ja visionäärisiä lähestymistapoja. Ongelmien perimmäiset syyt ovat vesihuolto- ja sanitaatiosektorin heikoissa institutionaalisissa järjestelyissä, kun taas kestäviin ratkaisuihin päästään vain useiden yhteiskunnan sektoreiden yhteisillä ja koordinoituilla ponnisteluilla.

Tämän tutkimuksen tavoitteena oli pääasiallisesti kehittää ja soveltaa systeemisiä ja visionäärisiä menetelmiä, erityisesti koskien (i) ennakoivaa lähestymistapaa vesisektorin toimintapolitiikan ja reformien toteuttamiseen, (ii) visionääristä johtamista vesihuollosta vastaavissa organisaatioissa, ja (iii) vaihtoehtoista visionääristä lähestymistapaa kehityshankkeiden suunnittelussa ja toteuttamisessa.

Tutkimus perustuu viiteen kansainväliseen referee-artikkeliin kestävän ja tuloksellisen vesihuollon pääelementeistä ja mahdollistavasta institutionaalisesta toimintaympäristöstä. Nämä pääelementit ovat (i) vesi- ja sanitaatioalan toimialapolitiikan ja reformien onnistunut toteuttaminen, (ii) vesihuoltoalan toimijoiden järkevät roolit ja erityisesti yksityisen ja julkisen sektorin yhteistyö, (iii) vesihuollon taloudelliset ohjauskeinot, rahoitus, hinnoittelu ja kustannusvastaavuus, (iv) asiakaslähtöisyys ja vesihuollon asiakkaiden keskeisempi rooli tulevaisuudessa, sekä (v) visionäärinen ja tietojohdaminen vesihuoltopalveluissa. Hyvä hallinto, organisaatioiden ja institutionaalisten järjestelyjen tuloksellisuus ja tehokkuus ovat vesihuoltopalvelujen kestävyiden kannalta läpäiseviä teemoja kaikille näille pääelementeille.

Perinteiset taloudelliset kehitysteoriat eivät täysin selitä vesihuollon keskeisiä ongelmia eivätkä tarjoa niihin kestäviä ratkaisuja. Institutionaalisen taloustieteen teoriat yhdessä muiden institutionaalisten teorioiden, organisaatioteorioiden ja johtamisteorioiden kanssa auttavat paremmin ymmärtämään kehitysmaiden vesihuollon monimutkaista ongelmavyöhykettä. Tulevaisuuden tutkimuksen ontologia ja epistemologia puolestaan tarjoavat proaktiivisen ja systeemisen lähestymistavan, jolla voidaan käsitellä vesihuollon kasvavia tulevaisuuden haasteita.

Tämän tutkimuksen hypoteeseja ja havaintoja testattiin kansainväliselle asiantuntijajoukolle suunnatuilla delfitutkimuksilla ja haastatteluilla. Asiantuntija-argumentointi vahvisti käsityksen, että sekä avunantajien että kehitysmaiden toimintapolitiikat ja strategiat ovat useimmiten perustuneet kapeaan ja muoti-ilmiöitä korostavaan lähestymistapaan eivätkä siten ole olleet riittävän kokonaisvaltaisia. Viime aikoina nämä ovat oleellisesti parantuneet, mutta silti niiden toteuttaminen käytännössä on usein onnistunut huonosti.

Useat maat toteuttavat parhaillaan vesihuoltosektorin reformiprosesseja, joissa uudistetaan toimintapolitiikkaa sekä lainsäädäntöä ja hallintojärjestelmiä. Liian usein kuitenkin avunantajat ja ulkomaiset asiantuntijat johtavat reformiprosessia, jolloin paikallinen vaikuttaminen ja sitoutuminen jäävät liian vähäiseksi etenkin hallinnon alemmilla tasoilla.

Toimintapolitiikka ja reformiprosessi pitää räätälöidä paikallisiin olosuhteisiin sopivaksi, koska toimivaa yleispätevää mallia ei ole olemassa. Erilaisten toimijaryhmien osallistuminen ja sitoutuminen on turvattava prosessin alusta lähtien. Erityisesti asiakkaat ja välilliset toimijat on usein unohdettu kehitysmaiden reformiprosesseissa.

Yksityistämistä ja suurempaa yksityisen sektorin osallistumista on tarjottu yleiseksi ”ihmelääkkeeksi”, jolla vesihuoltopalvelujen tehokkuutta ja toimivuutta voidaan parantaa ja turvata lähes rajattomat rahoitusmahdollisuudet. Kiistely julkisen ja yksityisen omistamisen ja järjestelmien operoinnin suhteellisista eduista on jatkunut kiivaana, tosin useimmiten riittämättömin tieteellisin perustein. On ilmeistä, että vesihuoltopalvelujen institutionaaliset ja hallinnolliset järjestelyt pitäisi suunnitella nimenomaan paikallisten olosuhteiden mukaisesti. Tarjolla on laaja kirjo hyviä vaihtoehtoja, joihin kuuluu sekä julkisen että yksityisen sektorin omistajuus ja operointi sekä näiden yhdistelmät. Vaihtoehtojen kirjoa pitäisi vaalia sen sijaan, että pyrittäisiin vakioratkaisuihin, jotka eivät sovellu kaikkialle.

Riittämätön rahoitus ja kustannusvastaavuus ovat edelleen eräs kehitysmaiden vesihuollon suurimmista esteistä. Aiemmin epäterve hinnoittelupolitiikka oli keskeisiä syitä taloudellisten resurssien riittämättömyyteen vesihuoltolaitosten johtamisen ja asiakassuhteiden tehottomuuden lisäksi. Julkisten vesihuoltolaitosten autonomian lisääminen ja niiden hallinto- ja johtamisjärjestelmien uudistaminen on suuri haaste, mutta silti useimmiten kestävämpi ratkaisu kuin niiden korvaaminen yksityisillä operaattoreilla.

Kehitysmaiden kaupunkien vesihuoltolaitokset ovat perinteisesti toimineet tarjontalähtöisesti. Tulevaisuudessa niiden on muututtava asiakaslähtöisemmiksi ja otettava paremmin huomioon asiakkaat palveluketjun tärkeinä toimijoina. Toisaalta kehitysmaiden maaseudun vesijärjestelmissä on pitkään sovellettu käyttäjälähtöistä hallinnointia, josta kaupunkien vesihuoltolaitokset voisivat ottaa oppia.

Vesihuoltolaitokset ovat yleisesti olleet varsin konservatiivisia ja lyhytjänteisiä johtamiskäytännöissään. Tulevaisuuden tutkimukseen perustuvia visionäärisen johtamisen menetelmiä tarvitaan sekä toimialapolitiikan ja päätöksenteon tasolla että vesihuoltolaitoksilla – niin kehitysmaissa kuin teollisuusmaissakin. Visionääristä lähestymistapaa tarvitaan myös reformiprosessin toteuttamiseen ja vaikutuksiin liittyvien tulevaisuuden epävarmuuksien hallitsemiseksi. Tässä tutkimuksessa korostetaan integroitua lähestymistapaa, jossa yhdistetään skenaariotekniikoiden ja strategisen johtamisen menetelmien käyttö.

Integroitua menetelmää testattiin arvioitaessa Kenian vesisektorin reformiprosessia, joka on alkanut 1990-luvun loppupuolella. Reformin tarkoituksena on selkeyttää vesivarojen hallinnan ja vesipalvelujen vastuuta ja organisaatorakenteita. Tutkimuksessa osoitetaan puutteita kenialaisten esittämissä institutionaalisissa järjestelyissä ja suositellaan hyvän hallinnon periaatteita paremmin huomioon ottavia järjestelyjä. Kenian tapaustutkimuksesta saadut kokemukset visionäärisen prosessin soveltuvuudesta olivat positiivisia ja sitä suositellaan muihinkin vastaavanlaisiin reformiprosesseihin. Tulevaisuuden tutkimuksen ja visionäärisen johtamisen menetelmiä suositellaan käytettäväksi myös kehityshankkeiden suunnittelussa ja toteuttamisessa.

Avainsanat: vesihuoltopalvelut, vesien hallinta, visionäärinen kehittäminen, visionäärinen johtaminen, tulevaisuuden tutkimus, skenaariotekniikat, strategiaprosessi, tuloksellisuus, hallintavaihtoehdot, institutionaalinen kehittäminen, institutionaaliset järjestelyt, institutionaalinen viitekehys, reformi, organisointi, johtajuus.

VISIONARY MANAGEMENT IN WATER SERVICES: REFORM AND DEVELOPMENT OF INSTITUTIONAL FRAMEWORKS

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LIST OF ORIGINAL PUBLICATIONS

The dissertation is based on the following peer-reviewed, internationally published articles, referred to in the text by their Roman numerals:

- I Seppälä, O.T. 2002. Effective water and sanitation policy reform implementation: need for systemic approach and stakeholder participation. *Water Policy*, Vol. 4, No. 4, pp. 367-388.
- II Seppälä, O.T., Hukka, J.J. and Katko, T.S. 2001. Public-private partnerships in water and sewerage services: Privatization for profit or improvement of service and performance? *Public Works Management & Policy*, Vol. 6, No. 1, pp. 42-58.
- III Seppälä, O.T. and Katko, T.S. 2003. Appropriate pricing and cost recovery in water services. *Journal of Water Supply: Research and Technology – AQUA*, Vol. 52, No. 3, pp. 225-236.
- IV Seppälä, O.T., Rajala, R.P. and Katko, T.S. Customer-responsive water and sanitation services. *Journal American Water Works Association (AWWA)*. (Accepted, in press).
- V Seppälä, O.T., Rodiqi, I., Nyangeri, E.N. and Hukka, J.J. Visionary leadership and knowledge management in water services. *Journal of Infrastructure Systems (ASCE)*. (Submitted, tentatively accepted).

THE AUTHOR'S CONTRIBUTION

Article I:

Osmo Seppälä wrote the article independently and is the corresponding author.

Article II:

Osmo Seppälä wrote and compiled substantial part of the article and is the corresponding author. The co-authors' contribution was related to the results from the study for the Municipal Development Foundation.

Article III:

Osmo Seppälä wrote substantial part of the article and is the corresponding author. The co-author has provided inputs in developing the cost recovery model.

Article IV:

Osmo Seppälä wrote substantial part of the article and is the corresponding author. The second co-author provided the case study material from Finland.

Article V:

Osmo Seppälä wrote the visionary management part and structured the main contents of the article, and is the corresponding author. He also carried out and analysed the Delphi surveys. The co-authors provided inputs in their fields of expertise.

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ABBREVIATIONS AND ACRONYMS

AG	Attorney General	DWEO	District Water Engineer's Office (until July 1998)
AQUA-LIBRIUM	European Water Markets Between Regulation and Competition (Research project funded by EC)	DWO	District Water Officer (since July 1998)
AWWA	American Water Works Association	DWOO	District Water Officer's Office (since July 1998)
AZIDES	methodology to build effective teamwork in an organisation	EC	European Commission
BASICS	Battelle Scenario Inputs to Corporate Strategies	EFQM	EFQM Excellence Model (previously European Model for Business Excellence)
BM	benchmarking	EIA	environmental impact assessment
BMZ	Bundesministerium für Zusammenarbeit (Germany)	ESA	external support agency
BOO	build-own-operate	EU	European Union
BOOT	build-own-operate-transfer	EUR	Euro, the European Union currency unit
BOT	build-operate-transfer	EUREAU	European Union of National Associations of Water Suppliers and Waste Water Services
BPR	business process re-engineering	EWA	European Water Association
BSC	balanced scorecard	FAR	field anomaly relaxation
CAAC	Catchment Area Advisory Committee	FCR	full cost recovery
CAC	Catchment Area Committee	FFA	Finland's Futures Academy
CADWES	Capacity Development in Water and Environmental Services	FFA	Framework for Action
CATWOE	Customer/Agent/Transformation/Worldview/Owner/Environment	FFCR	full financial cost recovery
CB	capacity building	FIM	Finnish Markka (5.94573 FIM = 1 EUR)
CBO	community based organisation	GATS	General Agreement on Trade in Services
CCT	core competence tree	GDP	gross domestic product
CIA	cross-impact analysis	GEM	gender empowerment measure
CL	charismatic leadership	GEO	Global Environment Outlook
CM	change management	GIS	geographical information system
CPI	corruption perception index	GNP	gross national product
CSF	critical success factor	GOF	Government of Finland
CTO	contingency theory of organisations	GOK	Government of Kenya
CWS	community water supply	GPN	Global Public Networks
CWSMP	Community Water Supply Management Project	GTZ	Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) GmbH
DDA	demand-driven approach	GWP	Global Water Partnership
DRA	demand-responsive approach	HDA	human development approach
DDC	District Development Committee	HDI	human development index
DINK	data, information and knowledge	HIPC	heavily indebted poor countries
DivWO	Divisional Water Officer (previously abbr. DWO)	HPD	human potential development
DL	deep leadership	HPI	human poverty index
DL	dynamic leadership	HRD	human resource development
DPM	Directorate of Personnel Management	HRW	Human Rights Watch
DRA	demand-responsive approach	IAA	integrated assessment approach
DSS	decision-support system	IAP	Iguacu Action Programme
DWAF	Department of Water Affairs and Forestry (South Africa)	IBT	increasing block tariff
DWB	District Water Board	IDWSSD	International Drinking Water Supply and Sanitation Decade
DWD	Department of Water Development (Kenya and Zanzibar)	IEA	Institute of Economic Affairs
DWD	Directorate of Water Development (Uganda)	IEEB	Institute of Environmental Engineering and Biotechnology
DWE	District Water Engineer (until July 1998)	IIA	institutional impact assessment
		IL	intelligent leadership
		IMF	International Monetary Fund
		IMO	Institutional and Management Options

INCO	International Co-operation	NGO	non-governmental organisation
IRC	International Water and Sanitation Centre	NIE	new institutional economics
ISO	International Organization for Standardization	NIEO	New International Economic Order
ISSP	integrated scenario and strategy process	NLP	neuro-linguistic programming
IT	information technology	NORAD	Norwegian Agency for Development Cooperation
IWA	International Water Association	NPM	new public management
IWRM	integrated water resources management	NWCPC	National Water Conservation and Pipeline Corporation (Kenya)
KADS	knowledge analysis and documentation system	NWRMS	National Water Resources Management Strategy
KES	Kenyan Shilling	NWSS	National Water Services Strategy
KEWI	Kenya Water Institute	OB	organisational behaviour
KM	knowledge management	OD	organisational development
KO	knowledge organisation	OECD	Organization for Economic Cooperation and Development
KTA	Kosovo Trust Agency	OFWAT	Office of Water Services (UK)
KVDA	Kerio Valley Development Authority	OIE	old institutional economics
KWS	Kenya Wildlife Service	O&M	operations and maintenance
LA	local authority	OM	organisational memory
LBDA	Lake Basin Development Authority	OO	organic organisation
LEAP	Lead – Empower – Align – Persevere	OP	organisational psychology
LFA	logical framework analysis	PCL	principle-centred leadership
LO	learning organisation	PDS	Professional Delphi Scan
MAF	Ministry of Agriculture and Forestry	PESTE	political, economic, social, technological and environmental
MBN	management by navigation	PESTEL	political, economic, social, technological, environmental, and legal
MBO	management by objectives	PFI	Private Finance Initiative
MBR	management by results	PI	performance indicator
MBV	management by values	PIA	policy impact assessment
MDG	Millennium Development Goals	PPC	public-private co-operation
M&E	monitoring and evaluation	PPP	public-private partnership
MENR	Ministry of Environment and Natural Resources (Kenya)	PRINWASS	Barriers to and Conditions for the Involvement of Private Capital and Enterprise in Water Supply and Sanitation in Latin America and Africa: Seeking Economic, Social and Environmental Sustainability (Research project funded by EC)
MFA	Ministry for Foreign Affairs		
MLRRWD	Ministry of Land Reclamation, Regional and Water Development (until 1998)	PRSP	poverty reduction strategy programme
MM	mental management	PSP	private sector participation
MO	mechanistic organisation	PWE	Provincial Water Engineer (until July 1998)
MOA	Ministry of Agriculture (Kenya)	PWEO	Provincial Water Engineer's Office (until July 1998)
MOCSS	Ministry of Culture and Social Services (until 1998)	PWO	Provincial Water Officer (since July 1998)
MOE	Ministry of Education	PWOO	Provincial Water Officer's Office (since July 1998)
MOH	Ministry of Health	R&D	research and development
MOLG	Ministry of Local Government (Kenya)	REC	Regional Environment Centre
MTI	Ministry of Trade and Industry	REDI	Recent Economic Developments in Infrastructure
MWLE	Ministry of Water, Lands and Environment (Uganda)	SBA	strategic business area
MWR	Ministry of Water Resources (since 1998)	SDA	supply-driven approach
MWRMD	Ministry of Water Resources Management and Development (since 2003)	SDP	strategic development programme
n.a.	not available	SERVQUAL	system to measure service quality dimensions
NARC	National Rainbow Coalition	SGZZ	St. Galler Zentrum für Zukunftsforschung
NDP	National Development Plan		
NEMA	National Environmental Management Authority		
NEPAD	The New Partnership for Africa's Development		

SHG	self-help group	VM	visionary management
SIA	sustainability impact assessment	VMAR	Vision, Mission, Actors, Structure
SIDA	Swedish International Development Agency	VSM	viable systems model
SIPSS	small independent private service providers	VWF	Virtual Water Forum
SL	situational leadership	WACSI	water customer satisfaction index
SM	soft modelling	WASH	Water and Sanitation for Health
SM	strategic management	WATERTIME	Improving the Quality of Urban Life through Sustainable Decision-Making on City Water System Reform
SO	strategic organisation		(Research project funded by EC)
SODA	strategic options development and analysis	WB	World Bank
SSM	soft systems methodology	WBI	World Bank Institute
ST	stakeholder theory	WBCSD	World Business Council for Sustainable Development
STO	systems theory of organisations	WEDC	Water Engineering and Development Centre
SUP	Settlement Upgrading Programme	WHO	World Health Organization
SWOT	Strengths – Weaknesses – Opportunities – Limitations	WICS	wisdom, intelligence, creativity – synthesised
SWWF	Second World Water Forum	WID	women in development
TAL	transactional leadership	WPI	water poverty index
TARDA	Tana River Development Authority	WRI	World Resources Institute
TEKPA	Technical Services Development Project	WRM	water resources management
TCE	transaction costs economics	WRMA	Water Resources Management Authority (Kenya)
TFL	transformational leadership	WRUA	Water Resources Users Association
TOC	table of contents	WS	water supply
TQM	total quality management	WSB	Water Services Board (Kenya)
TUT	Tampere University of Technology	WSP	Water Services Provider
TZS	Tanzanian Shilling	WSRB	Water Services Regulatory Board (Kenya)
UDSM	University of Dar es Salaam	WSRS	Water Sector Reform Secretariat (Kenya)
UFW	unaccounted-for water	WSRSC	Water Sector Reform Steering Committee (Kenya)
UK	United Kingdom	WSS	water supply and sanitation
UN	United Nations	WSSCC	Water Supply and Sanitation Collaborative Council
UNDP	United Nations Development Programme	WSSD	World Summit on Sustainable Development
UNEP	United Nations Environment Programme	WSTF	Water Services Trust Fund (Kenya)
UNESCAP	United Nations Economic and Social Commission for Asia and the Pacific	WTO	World Trade Organization
UNESCO	United Nations Educational, Scientific and Cultural Organization	WTP	willingness to pay
UNICEF	United Nations Children's Fund	WUA	Water Users Association
UNMA	United Nations Millennium Assembly	WUP	Water Utility Partnership
UNU	United Nations University	WWA	World Water Actions
UON	University of Nairobi	WWC	World Water Council
USA	United States of America	WWDR	World Water Development Report
USD	United States dollar	WWV	World Water Vision
VEVI	Development of Finnish Export Activities in Water Services Sector	ZUWSP	Zanzibar Urban Water Supply Project
VIS	visionary scenario process		
VisMASST	Vision, Mission, Actors, Structure, Strategy, Transformation		
VL	visionary leadership		

1 INTRODUCTION

1.1 Background

In several international forums local scarcity of freshwater and peoples' access to basic water and sanitation services have been recognised as among the most important issues facing humankind in the new millennium (Glenn and Gordon, 2000, 2002, 2003b; UNU, 1999; WSSD, 2002). According to the global assessment data (WHO and UNICEF, 2000), about 1.1 billion people still lack access to improved water supply and about 2.4 billion people lack access to improved sanitation services. The vast majority of these non-served people live in Asia and Africa.

About 10 000 people die from lack of safe drinking water and especially due to inadequate sanitation facilities (WHO and UNICEF, 2000). Each year, 3-4 million children under 5 die from dehydration as a result of waterborne diseases caused by polluted water (WaterAid, 2002; WHO and UNICEF, 2000). Improved water and sanitation services are the necessary remedy to reduce these fatal health problems.

Scarcity of water resources threatens development in many regions. Unfortunately, many of the regions and countries that now have inadequate water and sanitation services are going to face increasing scarcity of available water resources. This is further aggravated by high population growth in the same regions. For instance, the urban population in Eastern Africa is projected to double about every ten years (Hukka, 1994, p. 17). Although the greatest increase in population will be in urban areas, the worst levels of service coverage currently are in rural areas (WSSCC, 2000). It is predicted that two thirds of the world's population will be living with chronic water shortages and polluted water environments by the year 2050 (Cetron and Davies, 2003; UN, 2003).

Thus, the development needs are enormous although not necessarily totally unrealistic. It has been estimated that to substantially improve the coverage and level of water and sanitation services mainly in the developing economies, additional financial resources of about USD 180 billion would be needed annually during the 25-year period (Vision 21, 2000; WWC, 2003a). The financial inputs seem reasonable compared to many other development investments. Yet, it has been estimated that developing countries need to construct 1.5-2 times more urban environmental infrastructure in the coming 30 years than exists currently in the developed countries (Kivistö, 1992). However, securing the financial resources alone will not be enough. Performance of the existing water and sanitation facilities is very poor (UNEP, 1999; Vision 21, 2000). There are several complex and interrelated impediments to inadequate and unsustainable operation of existing facilities and for poor performance of sector organisations.

There have been several serious attempts to solve global water and sanitation problems, while the results have remained modest. An overview of global and international policies and strategies aimed at improving the situation is presented in Article I. The international community has put a lot of effort into improving the water and sanitation service situation in the developing countries. A large number of international events, campaigns and programmes have been launched since the 1950s (Article I). Investments in the water and sanitation infrastructure have been massive, although obviously not adequate. Yet, real results seem to remain moderate and their sustainability is in doubt.

On the initiative of the World Commission on Water for the 21st Century, a long-term vision for addressing the water issues – the World Water Vision – was presented in the Second World Water Forum (SWWF) in The Hague, the Netherlands (March 2000) (WWV, 2000). Based on the results of the SWWF, consequent proposals for sector development were made in the International Conference on Freshwater in Bonn in December 2001. “The Bonn keys” included the five main points of water security, decentralisation, partnerships, co-operation, and better governance for water sector development (Box 1.1).

Box 1.1 *The Bonn keys for better water management (BMZ, 2001).*

1. Meet the water security needs of the poor.
2. Decentralisation (national policy vs. community needs).
3. New partnerships for better water outreach.
4. Cooperative arrangements at the water basin level.
5. Stronger and better performing governance arrangements.

Subsequent global efforts were raised at the World Summit on Sustainable Development (WSSD) in Johannesburg in September 2002 (WSSD, 2002) and the Third World Water Forum in Japan in March 2003 (WWC, 2003a). Most of the Johannesburg summit decisions, conclusions and results regarding the water and sanitation sector are linked to the Millennium Development Goals (MDGs) that were agreed in the United Nations’ Millennium Assembly (UNMA) in September 2000 (UN, 2000). The most fundamental target unanimously agreed at WSSD to ***halve the number of people without access to safe drinking water and adequate sanitation by the year 2015***. Targets were spelled out in more detail and actions proposed in the World Water Development Report (WWDR) (UNESCO, 2003), which was presented in the Third World Water Forum (WWC, 2003a).

WWDR (UNESCO, 2003) emphasises the following key issues that were concluded during the “visioning process” (GWP, 2000; Vision 21, 2000; WWC, 2003b; WWV, 2000):

- 1) Meeting basic needs
- 2) Securing the food supply
- 3) Protecting ecosystems
- 4) Managing risks
- 5) Sharing water resources
- 6) Valuing water
- 7) Governing water wisely.

The goals of the UNMA, the WSSD, and the WWDR, including their indicative international development targets for WSS coverage, are essentially the same as those set during the Vision 21 process (Vision 21, 2000). WSSCC introduced the Iguazu Action Programme (IAP) in 2000 (IAP, 2000). IAP derives from the overall goal of poverty reduction and sustainable human development. Its goal, within the time frame 2000 to 2005, and with a significant review at the Global Water and Sanitation for Health (WASH) Forum in 2004, is to make significant progress on the Vision 21 targets. To achieve that goal, its immediate purpose is to advocate and support the adoption of Vision 21 principles. The long-term targets of the Vision 21 process include the goal of providing ***water, sanitation and hygiene for all by 2025***. Vision 21 (2000) emphasises the indicative nature of these targets and the need to consider them in local context. Such targets are nevertheless helpful in assessing the magnitude of the task ahead in meeting the water and sanitation needs of the poor. These targets originate from the target of universal coverage established for the International Drinking Water Supply and Sanitation Decade (IDWSSD) 1981-90.

Institutional reform of the water and sanitation sector has been one of the key approaches in attempting to improve sector performance. In most cases the reform has included quality and price regulation, development of standards as well as institutional reform of water utilities. In practice this utility level reform has mainly meant that the role of the public sector (central and local governments) as a service provider has changed as the private sector has assumed a larger role in operations (WSSCC, 2000, p. 117). Institutional reform is a very time-consuming and complex process, which requires a thorough situation analysis, selection and description of the new reformed model, and planning for its successful implementation. Institutional reform cannot succeed without explicit political support and leadership, adequate and active involvement of all relevant sector stakeholders, formulation and approval of necessary legislation and regulations, and ensuring of adequate capacity of involved individuals and organisations.

This research explored the complex problems and constraints of the policy and institutional reform through analysis and synthesis of existing information and understanding and further elaboration and futures analysis based on selected case studies, such as the ongoing reform process in Kenya.

1.2 Objectives, purposes and results of the research

The objectives, purposes, activities, expected results and their indicators are shown in Table 1 in the format of the so-called logical framework. The **first two objectives** are related to the application of futures research to water sector reforms. It is recognised that water utilities, water sector organisations, and external support organisations (ESAs) should be able to formulate cognitive and coherent images of possible, plausible and preferable futures that enable them to make informed decisions about the development and management of viable water and sanitation services. Water and sanitation sector organisations should increase their capacity to apply long-term visionary management approaches both at the policy and the utility level.

In relation to the **third objective**, it should be noted that Finnish development assistance has traditionally also focused on project assistance. Preparation of projects has mainly followed the logical framework analysis (LFA), with involvement and inputs by the recipient organisations, mainly sector ministries. This approach has been fairly successful, but has not provided much flexibility in implementation if operational environment changes or selected strategies have proven unsuccessful. Therefore, an alternative and complementary approach to development assistance planning could be based on the use of futures research methodologies, interactive processes with essential stakeholders, and flexibility in implementation. This approach fits well to the changing role of Finnish development assistance, where wide and holistic sector development programmes are getting more emphasis.

In the past, policies and strategies to improve water and sanitation sector performance in developing countries have largely been based on "fashionable" approaches (Article I). These have improved the situation, but have not necessarily brought sustainable long-term results. The most recent panacea is privatisation and increased private sector participation. Most ESAs have based their latest policies on the assumption that the private sector is the solution to all financing, inefficiency and performance problems. However, policy, institutional, and management options have to be tailored in accordance with local conditions. Thus, the **fourth objective** is related to analysing the diversity of available options.

Table 1.1 *Objectives, purposes and results of the research.*

OBJECTIVES	PURPOSE / ACTIVITIES	RESULTS / INDICATORS
1 To provide analytical information, working tools and instruments for the implementation of sector reform and development of appropriate future institutional frameworks for viable water services.	To demonstrate the feasibility of applying futures research and visionary leadership and management to the planning and decision-making process of water and sanitation sector organisations, in order to enhance sustainable development of water services and to develop the epistemology of the policy and strategic decision making within these organisations.	Examples, guidelines and tested experiences of visionary management working processes within selected case study organisations.
2 To study the applicability of futures research methodologies and tools in the assessment of impacts and success of policy and institutional reforms.	To analyse the ongoing reform process of the Kenyan water sector, contribute to the future development of institutional frameworks.	Alternative scenarios for the water sector's institutional arrangements in Kenya. Analysis of the development strategies for the implementation of the reform process in Kenya.
3 To present approaches and processes that could facilitate improved quality and objectives of Finnish water and sanitation sector development co-operation.	To present an alternative approach to development assistance planning. The alternative approach is based on the use of futures research methodologies, interactive processes with essential stakeholders, and flexibility in implementation.	An outline of a development approach utilising the combination of scenario working processes, soft systems methodologies, and strategy implementation.
4 To analyse development trends, make comparative studies, and prove that the approach of global/uniform policy and institutional frameworks does not work.	To present a diverse spectrum of policy and institutional arrangements for water services management in developing countries.	A review and analysis of diverse policies and institutional frameworks, including discussion of methodological tools applicable in assessment of impacts of these diverse implementation processes.

1.3 Structure of the research

This research consists of five international peer-reviewed scientific articles and a scientific synthesis based on these articles and other research material, including case study analyses from various countries – especially Kenya. These scientific articles are based on the overall problem formulation, and are related to the perceived key elements of sustainable and viable water and sanitation services and the required institutional frameworks, as described in Chapter 2.2.

The overall structure of this research and dissertation is presented in Figure 1.1. This research analyses the problem situation at different levels: (i) general (global) policy level, (ii) water utility level (unspecific), (iii) policy level in case study regions (Kenya), and (iv) utility level in case study regions (Kenya). Figure 1.2 indicates the linkages between various research components: general theoretical and scientific considerations, scientific background articles, and the author's practical experiences from case study regions.

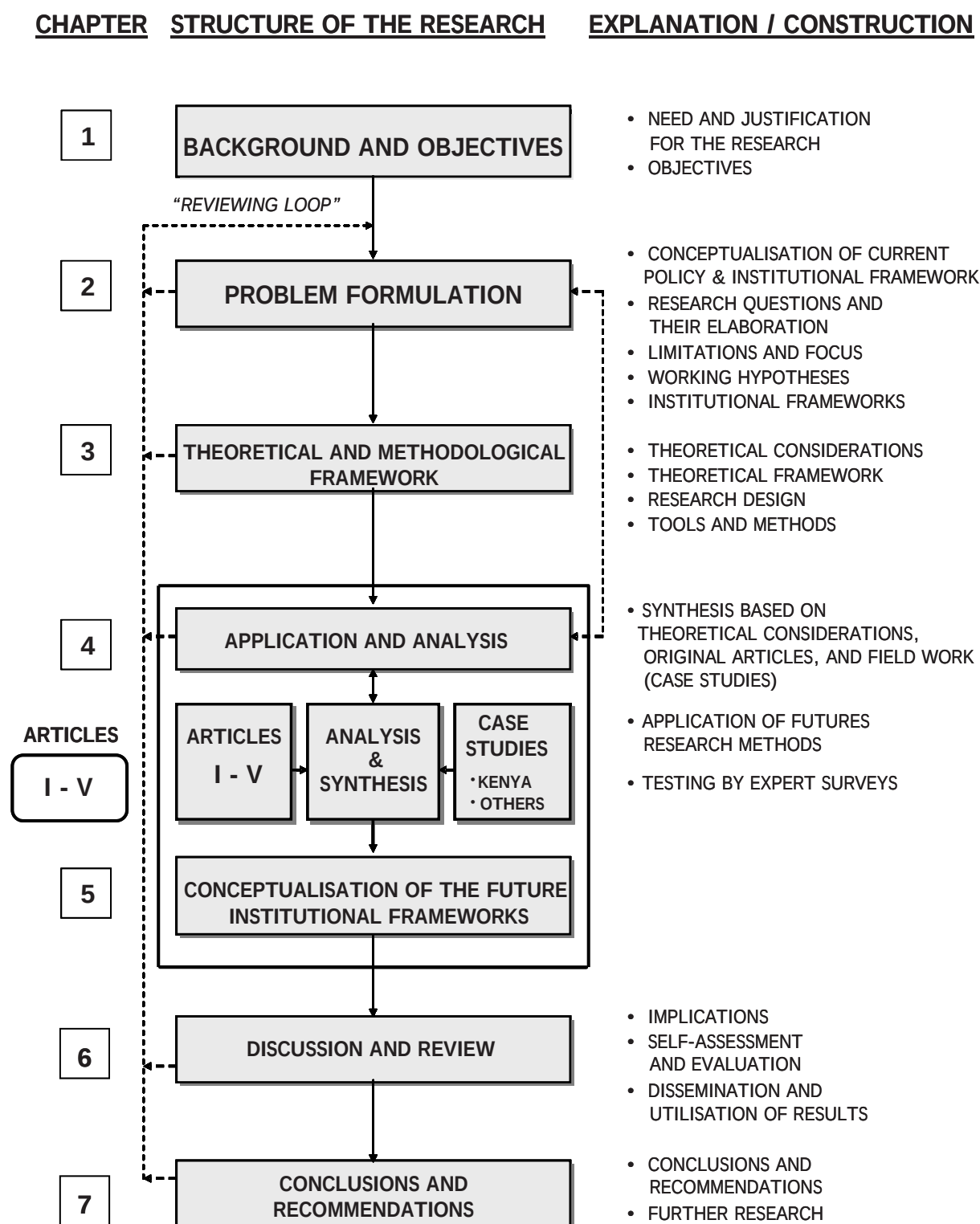


Figure 1.1 Structure of the research.

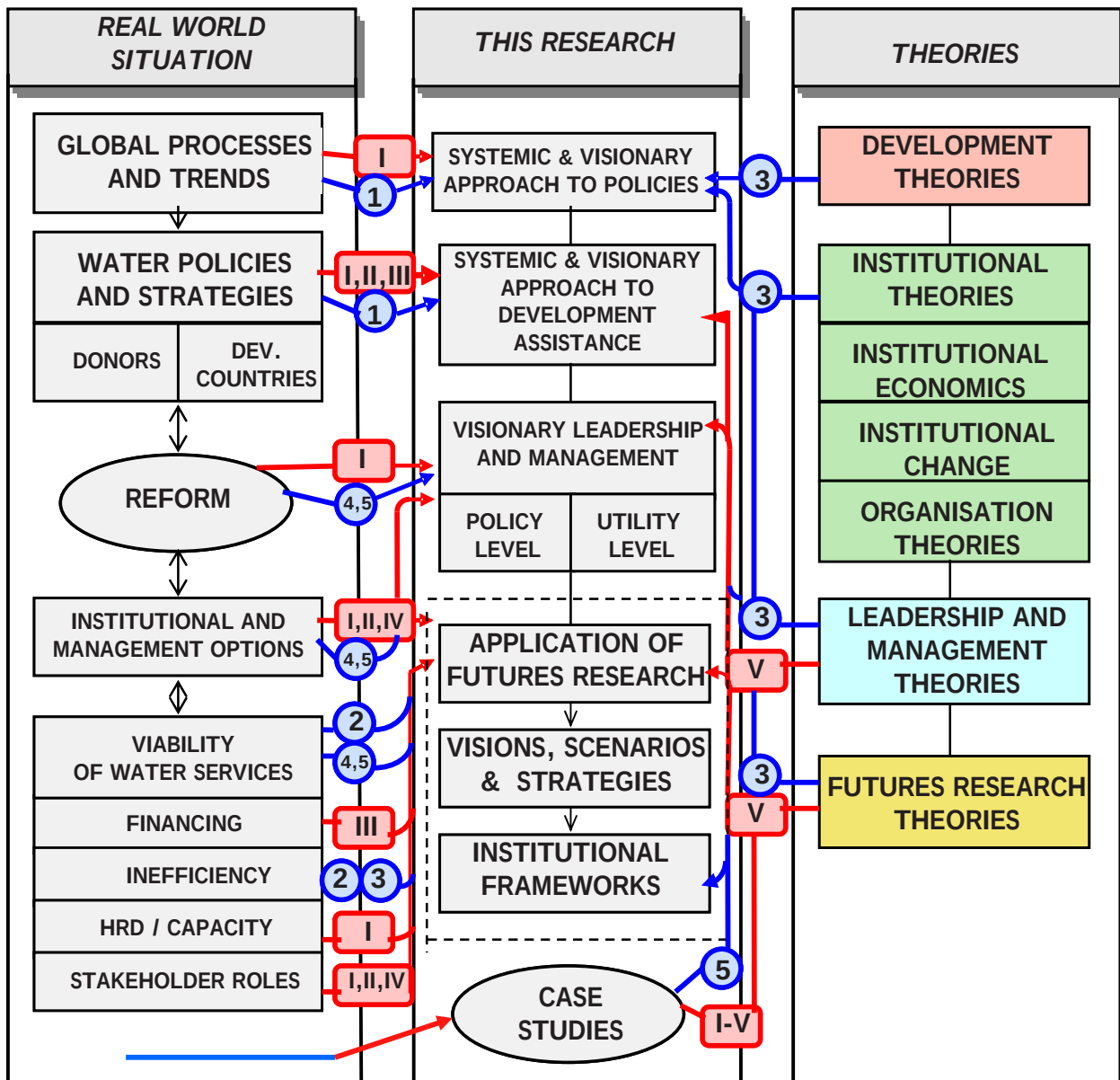


Figure 1.2 Linkages and relationships between the real world situation, theoretical considerations, and the analysis of this research. The Roman numerals (I-V) refer to the Original Publications (Articles I-V) and the Arabic numerals (1-5) to the chapters of the dissertation.

2 PROBLEM FORMULATION

2.1 Research problems and their justification

The importance of water and sanitation services as basic satisfiers and basic human rights has been widely recognised (UN, 2002; Watts, 2003). Yet, the inability to provide these services to all people seems to continue, especially in the developing world. One of the reasons why seemingly simple technologies and arrangements for water and sanitation services repeatedly tend to fail and remain inoperative after a reasonably short period of time is that water and sanitation services actually constitute a very complex system. The complexity of these systems results from their being “soft human activity systems”, as elaborated in Article V. Human activity systems are much more challenging to manage than purely technical ones.

Problems related to water and sanitation services cannot, however, be solved in isolation from other essential social, economic and infrastructure systems. Infrastructure, including water supply and sanitation, supports a complex socio-economic hierarchy of systems (Figure 2.1), where the social system relies on the economic system, the economic system on the infrastructure, and the infrastructure on the natural environment (Grigg, 1988).

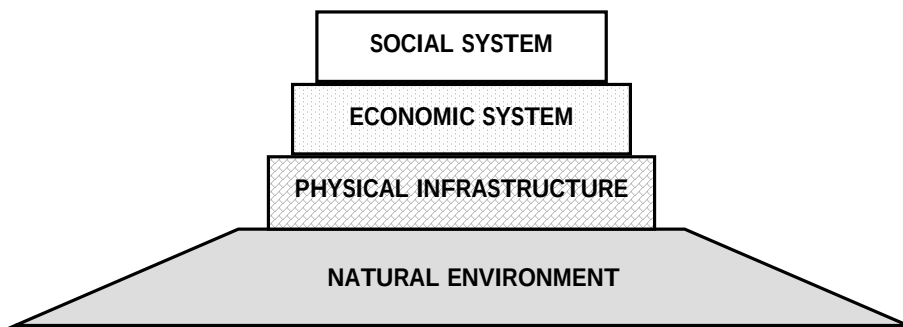


Figure 2.1 Relationship of infrastructure to socio-economic systems and environment (modified from Grigg, 1988).

Although it is understood that the problem situation – “*problematique*” – and the overall framework of this study are complex and interdisciplinary, for practical reasons selective limitations had to be made in order to stepwise narrow down the focus of this research:

- 1) Water and sanitation sector constraints are interrelated with other problems in society (such as economic, political and social), while this research focuses on the *water and sanitation sector*.
- 2) Integrated water resources management (IWRM) is a holistic approach to water sector problems, while this research concentrates on *water supply and sanitation services*.
- 3) Although sanitation is a growing concern within the WSS sector, this research deals mainly with *water supply services*.
- 4) In spite of rural water supply and sanitation being a huge challenge, this research focuses mainly on the *policy and institutional aspects of urban water supply services*.

Complex problem situations can be approached using the soft systems methodology (SSM), described in Chapter 3.6.5 and Article V. Instead of striving to elaborate all possible elements of the constraints, it is often more feasible to determine the “richest possible picture” of the perceived problem situation (Checkland, 1981). The initial unstructured problem situation may be defined by collecting perceptions of possible problems from several persons. In this research Delphi surveys among experts were used partly for this purpose.

The richest possible picture of the problem situation and formulation enables selection of a viewpoint from which the present situation can be further analysed. According to the SSM process, the problem situation is later expressed in a structured form, which can be further utilised in the systems approach (Article V; Chapter 3.6.5).

Different stakeholders usually perceive the problem situation and the main problems in different ways. Customers or users of water and sanitation services commonly perceive (i) inadequate coverage or quantity and (ii) inadequate service level (with its various components) as the core problems. Water utilities may perceive financing constraints due to inadequate customer revenue as the key problem. However, the root causes for these service problems are mostly institutional constraints, both at the policy-making and utility levels.

As a typical example, the poor overall situation with water and sanitation services in Kenya can be attributed to a large number of reasons. Figure 2.2 shows the author's unstructured perception about some key constraints in the WSS sector in Kenya and their interrelations in the form of a *rich picture* – as a tangled *problematique*.

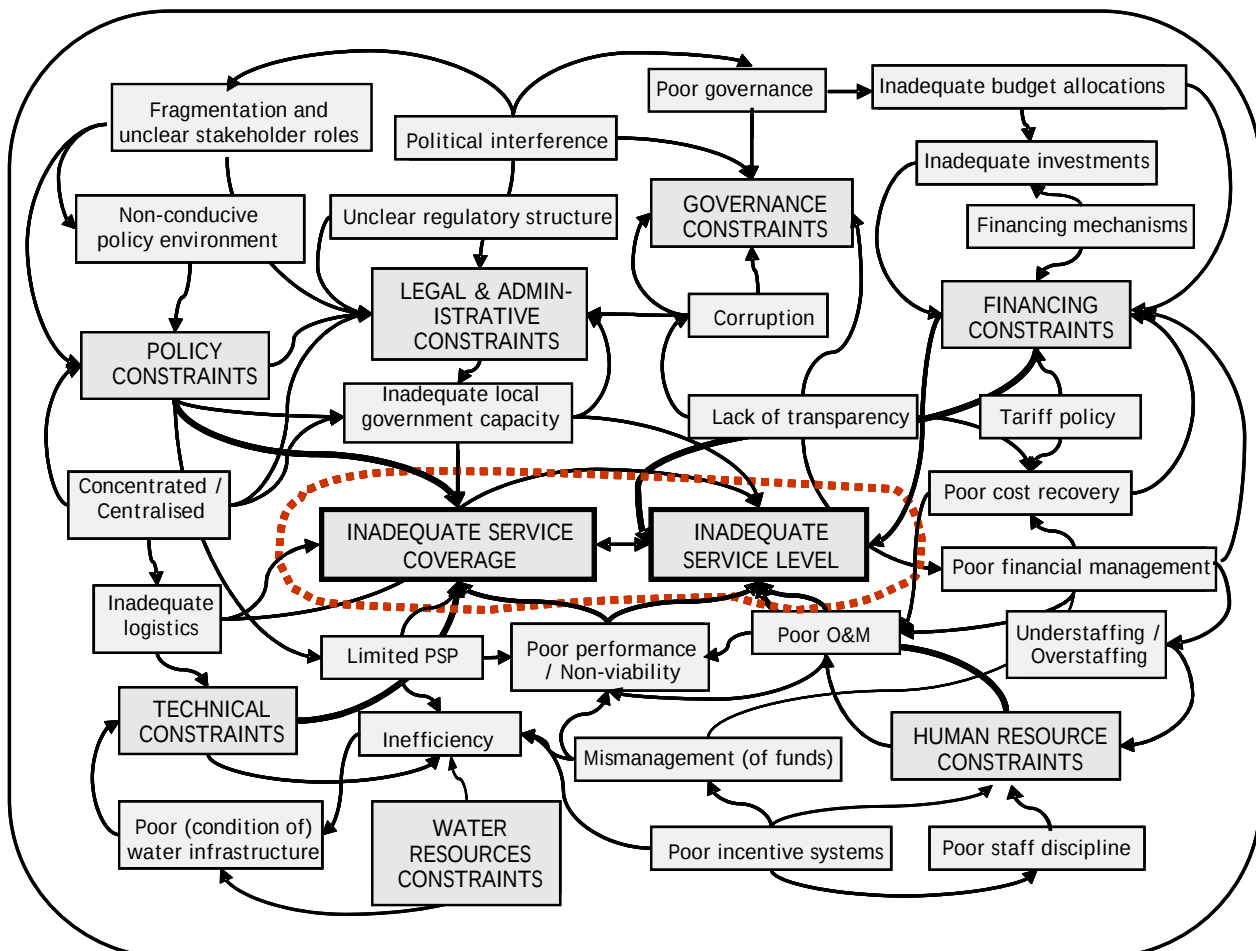


Figure 2.2 Water services sector problem situation in Kenya expressed as a “rich picture”.

At the utility level, the major constraints in water services provision seem to a large extent to have remained those identified by Katko (1986, 1991): inadequate cost recovery and funding limitations, operations and maintenance, and logistics constraints. However, nowadays it is better understood that many of the major constraints identified earlier are not actually root causes of the major problems but rather symptoms or impacts of them. Figure 2.2 shows some complex interrelations of the problems. However, water and sanitation development is strongly connected to complex and interrelated prerequisites of social and economic development (Chapter 3.3; Figure 3.4). Hukka (1994, p.16) discussed the “snowballing constraints” of peri-urban water and sanitation infrastructure development. Todaro (1999, p. 92) presented a multidimensional schematic framework for underdevelopment (Hukka, 1994, p. 30-31; Todaro, 1999). Overall development theories contributing to the understanding of the complex problem situation are discussed in Chapter 3.3.

Governance problems

Solving the constraints in water and sanitation service provision and inefficiency of sector organisations in most developing countries is essentially a governance problem (GWP, 2002a; Rogers and Hall, 2002; UNESCAP, 2003). This is related to governance inadequacies in several sectors of society – not only in the WSS sector. Yet, inefficient and ineffective water governance is to a large extent the core of the problems also in the WSS sector. Lack of good governance principles is one of the root causes of all major constraints within our societies, as well as in the water and sanitation services sectors of developing and transition economies. Major donors and international financial institutions are increasingly making it a condition of their aid and loans that reforms ensuring good governance are undertaken (UNESCAP, 2003). Good governance is participatory, consensus-oriented, accountable, transparent, responsive, effective and efficient, equitable and inclusive and follows the rule of law. It also assures that corruption is minimised, the views of minorities are taken into account and that the most vulnerable members in society are listened to in decision making. It is also responsive to the future needs of society (Figure 2.3).

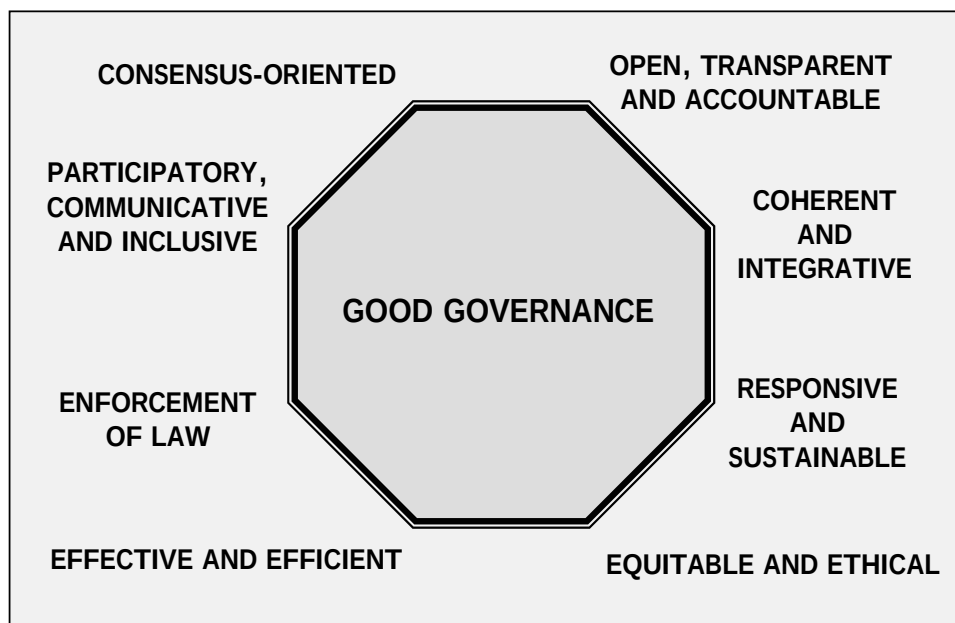


Figure 2.3 Characteristics of good governance (modified from Rogers and Hall, 2002; UNESCAP, 2003).

Water governance is an exercise of political, economic, administrative and social authority, which influences the development and management of water resources and related services delivery (UNESCO, 2003). It comprises mechanisms, processes and institutions through which citizens and groups articulate their interests, exercise their legal rights, meet their obligations, and mediate their differences in relation to water resources (UNESCO, 2003). To achieve good water governance it is necessary to create an enabling environment which facilitates (1) efficient private and public sector initiatives, (2) a regulatory regime which allows transparent transactions between stakeholders in a climate of trust, and (3) shared responsibility for safeguarding water and aquifer resources whose management affects many people but at present is the responsibility of none (GWP, 2002a; Rogers and Hall, 2002; UNESCO, 2003, p. 103). Sustainable and viable management of water resources requires systemic, integrated decision making that recognises the interdependence of these three elements.

Viability of services and water utilities

The concept of *viability* in water and sanitation services is described in Box 2.1.

Box 2.1 *The concept of viability (AWWA, 1995; Cromwell III, Rubin, Marrocco and Leevan, 1997).*

- Viable water systems are self-sustaining systems reliably meeting all present and future requirements in a dynamic, comprehensive manner that ensures the continued delivery of safe water (AWWA, 1995).
- Viable water systems are: (1) self-sustaining, (2) committed, and (3) have the financial, managerial, and technical capability to meet performance requirements on a long-term basis (Cromwell III et al, 1997).

Most water systems appear viable on their completion as they start operating. However, especially in developing countries, many water systems are soon found non-viable. Mismanagement is one reason for non-viability, but changes in the operational environment also have their impact. Water systems may have been implemented when the community was still demographically and economically healthy, good quality raw water was still abundantly available and treatment was not necessary. Even the management and institutional structures originally created to operate and maintain water systems may earlier have been adequate. However, they may no longer have the capacity to meet the challenges of the present and future, when many of those favourable conditions no longer exist. (Cromwell III et al, 1997).

Hukka (1998, p. 112) studied the viability of water systems in Kenya and concluded that in 1995 the viability of the water systems could be categorised as follows¹:

- Kenya (151 systems):
 - (a) viable systems 27 (18 %), (b) gray-zone systems 89 (59 %), (c) non-viable 35 (23 %)
- Western Province (33 systems):
 - (a) viable systems 2 (6 %), (b) gray-zone systems 24 (73 %), (c) non-viable 7 (21 %).

¹ This viability categorisation (viable – gray-zone – non-viable) is based on the white paper by AWWA (1995). In the 1996 SDWA amendments in the USA, the term “viability” was replaced with “capacity development”. It was thought that the viability concept would lead to unproductive discussion of classifying systems. Capacity development, on the other hand, clearly refers only to a positive emphasis on improving institutional capabilities in water systems (Cromwell III et al, 1997).

The main causes for viability problems in Kenya were: (i) inadequate financing, and (ii) lack of management autonomy and accountability. Hukka (1998, p. 115) summarised the main causes of non-viability of the Kenyan water systems in his “multidimensional schematic framework for self-sustaining problematique”.

Recent assessments on the performance of the Kenyan water services sector confirm some of the main factors contributing to non-viability as the following (NWSS, 2003; Nyangeri, 2002; Onjala, 2002a,b):

- (i) Inappropriate institutional and organisational arrangements have led to political interference and poor governance
- (ii) The key organisations in charge of urban water services are highly centralised, bureaucratic and lack transparency and accountability
- (iii) Inadequate financial and management capacity
- (iv) Economic recession
- (v) Poor choice of technology
- (vi) Lack of water demand management.

Efficiency problems

Non-viability of water systems is closely related to inefficiency. Public water and sanitation utilities have commonly been labelled as inefficient and ineffective. Poor public sector performance has been perceived by many as the main cause for inadequate service provision in developing countries. The concept of efficiency and its various components and interpretations are elaborated in Chapter 3.4.2.

Estache and Kouassi (2002) have analysed the factors contributing to the efficiency of 21 African water utilities. Although the utilities are highly different, their economic and technical efficiency is generally low. Consequently Estache and Kouassi (2002) conclude that “continuing the public or private financing of the sector without significant efficiency improvement is a major waste of scarce resources in the region”. Governance issues and the weakness of institutions are dominant drivers for inefficiency and poor performance. Ownership issues are also important. The main challenges do not, however, come from the water sector. The overall institutional capacity of the country and its governance structures at various levels are significant driving factors in the performance of water utilities.

In Kenya water service provision has been identified as ineffective and inefficient due to the following reasons (Nyangeri, 2002; NWSS, 2003; Onjala, 2002a,b):

- Water has been regarded as a social good
- Uncertainty over the policy regime and regulatory framework has been a major constraint in the WSS sector management
- Centrally managed monopolistic public enterprises or government departments have provided water services
- The centralised system of managing water utilities has made efficient operations difficult
- Lack of performance standards for water utilities.

2.2 Key elements of the research

The key elements of this research, contributing to the enabling environment and institutional arrangements for viability, are based on the problem formulation. The research questions (problems), initial working hypotheses, justifications, and research objectives are further analysed in subsequent chapters and in the Original Publications (Articles I-V).

The relevance of the identified key elements was tested among a group of professionals by the Delphi survey No. 5 (Table 4.1 in Chapter 4.1), in which 24 professionals from 16 countries participated. The initially proposed issues were considered extremely important: the importance degree varied between 3.8 and 5.0 (max. 5). The key elements were slightly modified as a result of this expert feedback and subsequently Articles I-V were based on these modified elements. Governance, viability, and efficiency issues were considered as cross-cutting issues for these key elements.

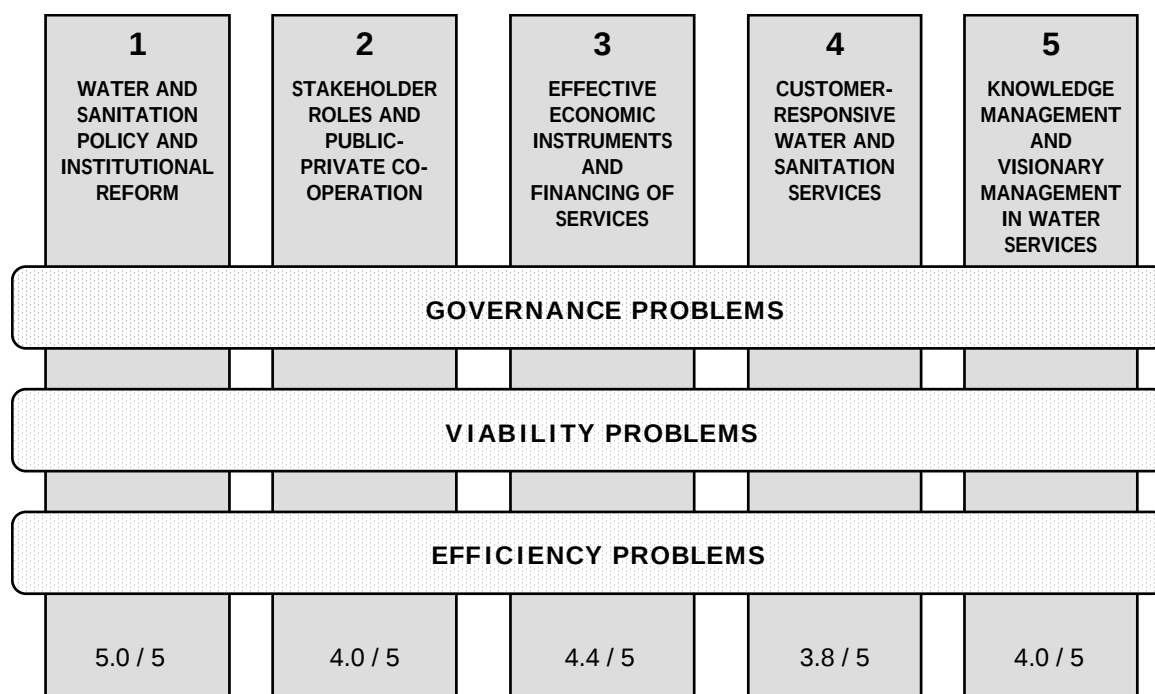


Figure 2.4 Key elements as main problem areas and cross-cutting issues.

The hypotheses and findings presented in Articles I-V were further tested in a series of Internet-based Delphi surveys and interviews among experts. Results of the Delphi surveys and expert argumentation are summarised in Chapter 4.

The key elements, subsequent articles on them and their testing and argumentation (Chapter 4) formed the foundation on which the analysis and synthesis of institutional and policy issues essential for water services sector reform was made in this dissertation. Literature review, theoretical considerations from several disciplines, as well as visionary approaches and selected methodologies of futures research were used to synthesise key institutional arrangements for successful reforms. The ongoing water sector reform in Kenya was used as a case study to demonstrate and test the relevance and validity of the selected approach.

3 THEORETICAL AND METHODOLOGICAL FRAMEWORK

3.1 Construction of the main theoretical framework of the research

Institutional development of water and sanitation services has been studied a lot, but often from a multidisciplinary perspective. The **external theoretical framework** of this dissertation builds on theoretical contributions from several disciplines. An understanding of wider development issues (Chapter 3.3) is important in conceptualising the complex problem situation and the governance aspects. Institutional theories (Chapter 3.4) – especially institutional economics – provide a solid basis for dealing with the viability and efficiency aspects of water and sanitation services. Review of leadership and management theories and practices (Chapter 3.5) narrows the focus to the policy and utility level considerations within the water and sanitation services sector. The ontology and epistemology of *futures research* (Chapter 3.6) provide the core methodological basis of this dissertation. The justification for using futures research and its methodologies is further explained in Chapters 3.6 and 3.5.2. Figure 3.1 shows the external theoretical framework of this dissertation and the main contributions of various scientific disciplines. This dissertation adheres to the *problem-oriented* research paradigm and uses approaches from both *hermeneutic* and *positivistic scientific traditions*.

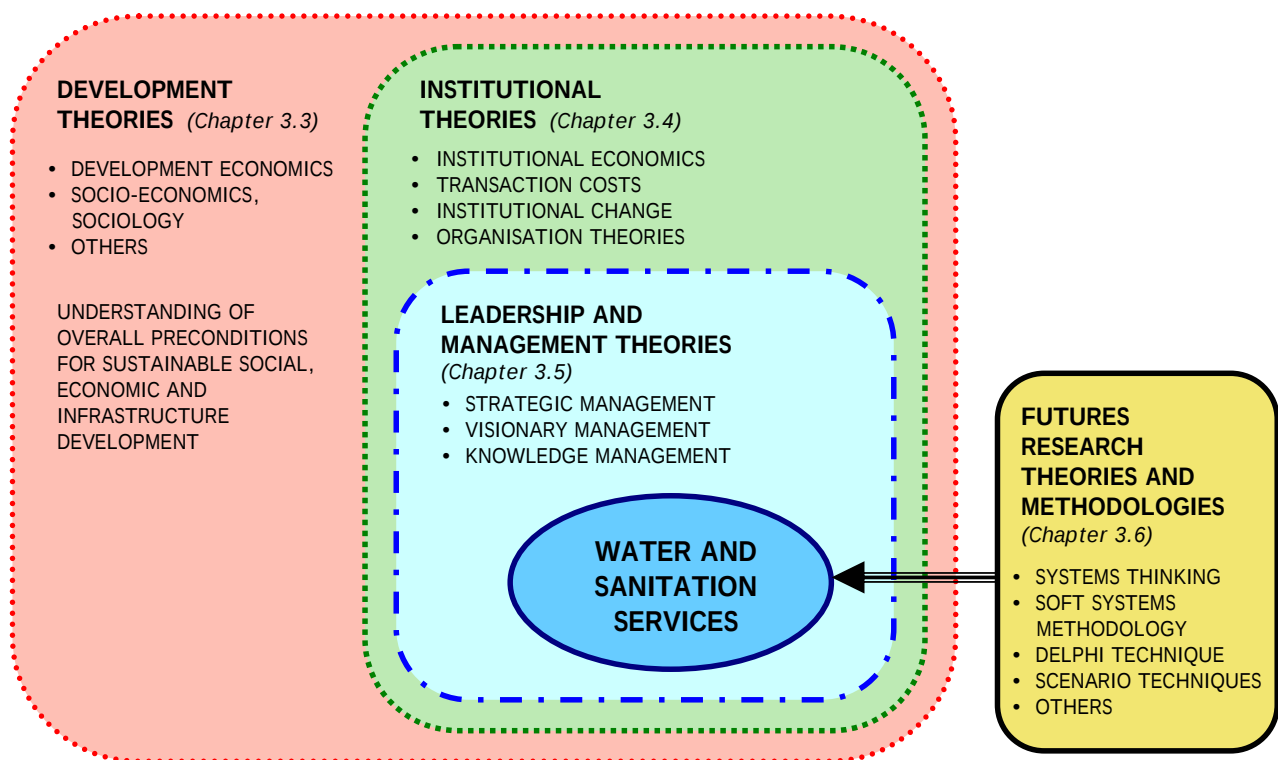


Figure 3.1 External theoretical framework of the research.

The more specific, **internal framework** of the study focuses on the key elements of enabling institutional arrangements for viable water services management especially in developing countries. The internal framework is described in Figure 3.2. The concept of good and effective water governance is a cross-cutting issue. The internal framework is closely related to the concept of “key dimensions of sustainable water supply: (1) operative technology, (2) appropriate institutions, and (3) adequate cost recovery” as introduced by Katko (1991, p. 64) and Hukka (1998, p. 140).

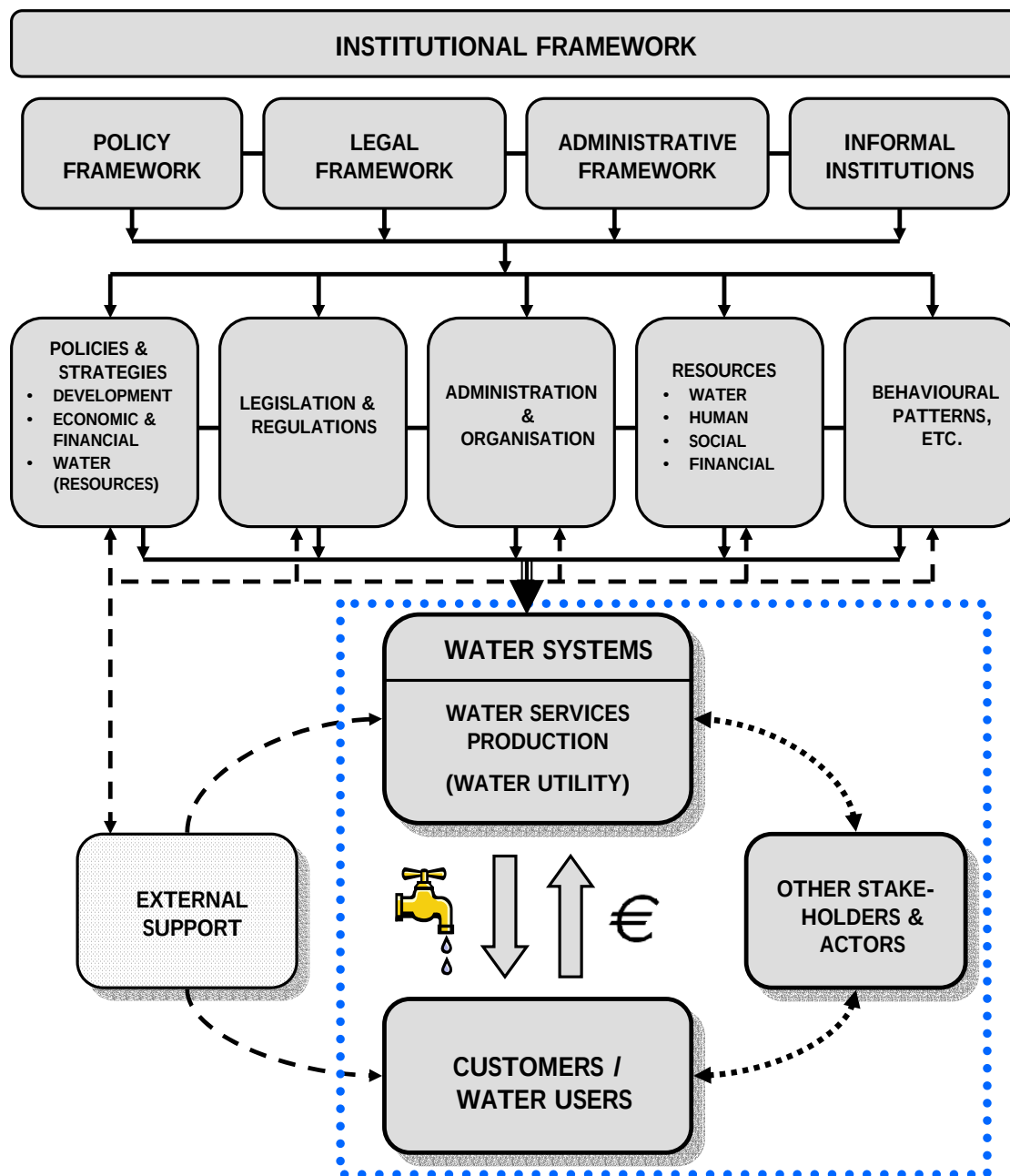


Figure 3.2 Internal framework of the research.

The complex research questions and the researcher's approach to them are discussed in Chapter 2. The research problems are relatively simple and manageable from the engineering perspective, but as a whole constitute a complex entity. A holistic understanding of the interrelationships and causalities of problems requires a generalistic research approach utilising contributions from several disciplines, as shown in Figure 3.1. The author's participation in other inter- and cross-disciplinary research projects financed by the European Commission (EC) – such as PRINWASS and WATERTIME – helped in conceptualising the research problems.

The *working hypotheses* are based on the *proposed key elements of viability of water and sanitation services and the required institutional changes – the reform process – to facilitate viability*. These hypotheses are based on the problem formulation (Chapter 2) and are further elaborated in Articles I-V and tested in Chapters 4 and 5. The scenarios and futures assessment presented in Chapters 4 and 5 act as an essential toolbox for claiming on the hypothesis that they assist in envisioning future development paths.

3.2 Research design, methodologies and tools

Research design and process. In the construction of the research process, methodology and foundation of the dissertation, especially the guidelines presented in the Internet-based Metodix and Futurix learning environments were used in addition to the scientific literature reviewed in Chapter 3. The flow of the research process cycle was mainly constructed using the Metodix guidelines (Metodix, 2003) and “roadmapping” techniques (Naumanen, 2001). The research process with its main stages is shown in Figure 3.3. The numbering shows the order of various research stages. Yet, the process was iterative and the peer-reviewed articles contributed both to problem formulation, results and synthesising analysis of this dissertation.

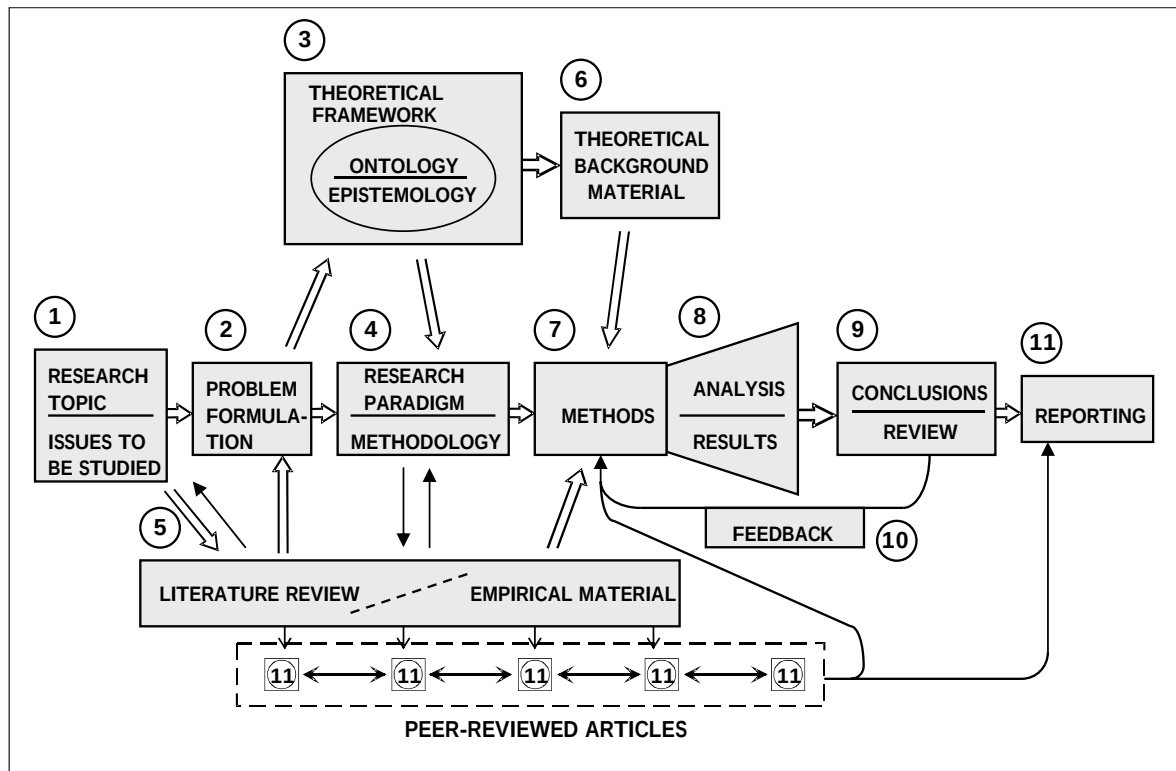


Figure 3.3 Research process.

Methodology. The methodology of the research was based especially on: (a) an extensive literature review, (b) collection and analysis of empirical field work data based on the author’s own experience and related case studies with research partners in developing countries, (c) interviews and Delphi surveys among experts, and consequent analysis of expert argumentation, (d) scenario techniques, (e) soft systems methodology, (f) an integrated scenario and strategy process applied in the case study of Kenya.

Data collection. Empirical research material was collected on the water sector reform processes and water utilities especially from Finland, Kenya and Zanzibar. Additional data mainly from Kenya and Tanzania was collected in connection with the PRINWASS research project. These data were both quantitative and qualitative. Quantitative data included substantial data and information on water utilities in Western Kenya and Zanzibar collected during the author’s field work period in 1993-1999, followed by short term missions until 2003. Additional water utility data were provided by partners within the EC funded research projects. Comparative water utility data was provided from Finland and Kosovo. The qualitative data included reports and descriptions of the institutional and organisational structure of the water sector in the case study countries, and material collected through expert surveys and interviews.

Delphi surveys (Chapter 3.6.2). During the various stages of the study an Internet-based expert survey program was used. Both the first-generation program called Professional Delphi Scan (PDS) and the second-generation program called Delfix were used. Delfix enables quick and wide collection and analysis of data and expert views from a large expertise base with wide geographic coverage. The new Delfix version incorporates the Survix and Debatix software components (Internetix, 2003). This combination was useful in collecting expert views and subsequently debating them.

Participants in the Delphi surveys and panels were selected mainly from members of the Water Supply and Sanitation Collaborative Council (WSSCC). There is a base of over 1000 sector professionals in WSSCC representing wide international expertise. The Delphi was applied in several stages to get expert views and information on the identified key issues, and for (i) testing the working hypotheses derived from the Original Publications and collecting expert views on them, (ii) constructing and testing the visions and scenarios for the key elements and case study specific issues, and (iii) testing and evaluating the proposed future institutional framework for Kenya.

Scenario techniques (Chapter 3.6.3). Scenario techniques were used to diagnose the essential issues and future options related to decision making. Alternative global and regional scenarios and the role and level of water services in different scenarios prepared in various international research programmes were analysed. These global and regional scenarios include Vision 21 and the Framework for Action (FFA), the Millennium project Lookout Study (UNU, 1999), Shell Group's Global Scenarios 1992-2020, the Scope study of GEO-2000 (UNEP, 1999), and World Business Council for Sustainable Development Global Scenarios Exploring Sustainability 2000-2050 (WBCSD, 2000) and the World Resources Institute (WRI) Global Scenarios (WRI, 1998).

Global and regional scenarios were partly utilised in constructing the alternative scenarios for reform process implementation in Kenya (Chapter 5). General local scenarios were developed in the Kenya Scenarios Project "Kenya at the Crossroads" in 1998-2000 (Kenya Scenarios, 2000). Water sector scenarios were built upon these general scenarios. The main drivers of normative scenarios were based on the identified key elements of viability, and their relevance was tested among experts by using the Delphi surveys. Scenario techniques were used to make futures assessment of the reform process and the proposed future institutional framework for water services in Kenya. The second-generation visionary scenario process (VIS) was also applied during the fieldwork stage. Morphological analyses, such as the field anomaly relaxation (FAR) method, were used to systematically screen the futures images regarding the sectors and drivers in order to eliminate incompatible states of the future from the futures matrix. The scenarios and the Delphi results were analysed using a cross impact analysis (CIA) to determine how alternatives influence each others.

Soft systems methodology (Chapter 3.6.5). Soft systems methodology (SSM) was mainly applied to the case study of Kenya (Chapter 5). Rich picture techniques and systems thinking were used to some extent in the problem formulation. Integrated scenario techniques on alternative institutional arrangements were used as a basis for the development strategy on the future institutional framework of viable water and sanitation services in Kenya. CATWOE and modified VMAR processes (VisMASST) were applied together with the SSM methodology to prepare the root definitions and system descriptions of the relevant water systems' institutional frameworks.

3.3 Wider development issues

The prerequisites and drivers of economic and social development in developing countries are complex and interrelated, and the problems are a mixture of inadequate or failed governance of various segments of the society as shown in Figure 3.4. The complexity of these societal problems affects also the viability of infrastructure services such as water and sanitation. Thus, a similar tangled *problematique* is recognisable within the water and sanitation sector, as discussed in Chapter 2 and shown in Figure 2.2.

It is obvious that problems related to water and sanitation services cannot be exclusively solved within the sector, but wider and interdependent issues of economic and social development have to be dealt with. As discussed in Article I and emphasised by Saleth and Dinar (1999), many of the constraints on the reform and institutional development of the water and sanitation sector are related to wider societal development issues outside the water sector.

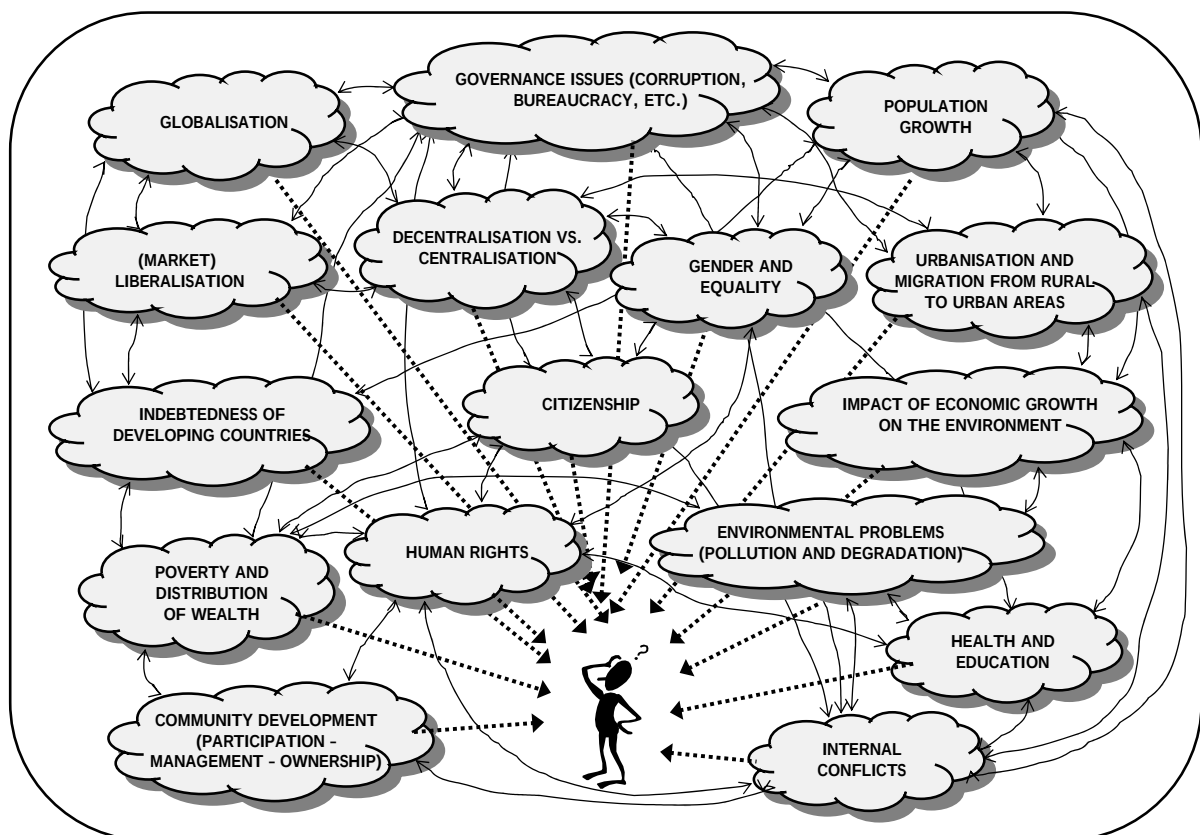


Figure 3.4 Issues of concern for overall social and economic development in developing countries.

Various development theories arising from different or interrelated disciplines, particularly ones concerned with cultural, political, social, and economic change, have been used to explain overall development phenomena. Yet, most of these development theories are mainly based on “rational schools of economics” and the assumption that economic theories are applied rationally. Some contributions of these theories are later discussed briefly.

Todaro (1999, pp. 91-94) has presented a multidimensional schematic framework of development, which is “both a physical reality and a state of mind”. The three core values of development are: (1) life-sustenance – including basic needs –, (2) self-esteem – including human rights –, and (3) freedom.

As highlighted in Chapter 1, the United Nations Millennium Assembly (UNMA) in September 2000 agreed on the Millennium Development Goals (MDGs)¹ that should be achieved by 2015 (UN, 2000). These goals are diverse and related to development in eight key areas and are to a large extent intended as solutions to the overall development concerns shown in Figure 3.4. MDGs classify development targets for water and sanitation improvements under “environmental sustainability”. Reduction of widespread poverty is seen as the most critical impediment to overall development and sustainability in developing countries (UN, 2000). Poverty is no longer seen only as an economic problem, but a “multifaceted situation that involves both the material and non-material conditions of life” (UNESCO, 2003). Thus, lack of safe water and sanitation services can also be seen as part of the poverty problem.

Achieving the MDGs requires strategic action in alleviating poverty. Developing countries should adopt pro-poor policies that reinforce each other and are targeted to achieving MDGs. Developed donor countries should back these reforms with more resources and trade opportunities. Both developed and developing countries should clearly prioritise MDGs in their national and global decision making. The Millennium Development Compact (UNDP, 2003) recommends substantial additional assistance from developed countries to developing countries: the UN estimates that annual development assistance should be doubled to at least USD 100 billion to achieve the MDGs.

Although poverty and economic underdevelopment are undoubtedly among the most critical constraints for overall sustainability in developing countries, in the future we can foresee numerous new and mixed challenges for them in the future. The reports on the “State of the Future” of the Millennium Project shed light on the future challenges at the global level, recognising that their impacts might be most adverse in the poorest developing countries (Glenn and Gordon, 2000, 2002, 2003b; UNU, 1999). The Millennium Project emphasises the growing importance of environmental issues and environmental sustainability and calls for global responsibility in addressing the required proactive measures and application of futures research (Glenn and Gordon, 2000; Heinonen, 2003). Availability of freshwater resources, access to safe drinking water and adequate sanitation services have been ranked among the top priorities of mankind in the 21st century.

In the older development thinking, economic development in developing countries was largely seen as an issue of growth and on the other hand as a result of dependence on developed countries. This kind of thinking clearly underlines many of the earlier economic development theories. Box 3.1 summarises some of the main approaches as they appear in the economic development literature of the 1950s to the 1990s.

Despite their weaknesses with respect to the current – more holistic – thinking about development, these classical theories of economic development can still to some extent be used to explain economic and social development in developing countries. Yet, development economics has no universally accepted paradigm, and insights and understandings are continually evolving.

¹ Achievement of the Millennium Development Goals (MDG) is monitored through MDG indicators, which is a framework of 8 goals, 18 targets and 48 indicators that were adopted by a consensus of experts from the United Nations Secretariat and IMF, OECD and the World Bank (UN, 2003). In addition to the human development index (HDI), development is also measured by other indices, such as the gender-related development index (GDI), the gender empowerment measure (GEM), and the human poverty index (HPI-1 and HPI-2) (UNDP, 2003).

Box 3.1 *Main approaches to economic development from the 1950s to the 1990s (Sources: Todaro, 1999; Todaro and Smith, 2003).*

1. *Linear stages of growth theories (1950s and 1960s):*
 - a) Rostow's stages of growth theory
 - b) Harrod-Domar growth model
2. *Structural change models (1960s and early 1970s):*
 - a) Lewis's dual sector theory of development
 - b) Chenery's patterns of development theory
3. *International dependence theories (1970s):*
 - a) Neo-colonial (neoclassical) dependence theory
 - b) False-paradigm model
 - c) Dualistic-development theories
4. *Neoclassical theories (1980s):*
 - a) Neoclassical counter-revolution (traditional neoclassical growth theory)
 - b) Free market approach
 - c) Public choice or new political economy approach
 - d) New public management (NPM)
 - e) Market friendly approach
5. *New growth theories (late 1980s and 1990s):*
 - a) Solow's neoclassical growth model
 - b) Endogenous growth theory

The growth theories of the 1950s and 1960s (Rostow and Harrod-Domar) are not particularly applicable to developing countries, and do not adequately address the issue of development in a wider context (Todaro, 1999, pp. 64-65; Todaro and Smith, 2003). In reality, economic development requires much besides economic growth. Grabowski and Shields (2000) expanded the Harrod-Domar model to introduce the role of persistent excess capacity during slow growth.

Structural change theories emphasised the transformation of developing countries from traditional, agricultural economies to modern, industrial economies. Lewis's dual sector theory suggested that the migration of rural population to urban areas in search of industrial employment opportunities would accelerate economic development (Todaro, 1999, pp. 68-73; Todaro and Smith, 2003). Although such migration really has happened on an extensive scale, its economic and other development impacts have in reality often been meagre at the national level. In most cases, rural unemployment and poverty have turned to urban unemployment and poverty. Urban centres – especially large cities and megacities – of the developing world have also created serious water, sanitation and solid waste management problems.

Chenery's patterns of development theory proposed a sequential change from agriculture-based economies to industry- and service-based ones, supported the accumulation of physical and human capital, the shift to non-food consumption and investment, urbanisation, and growth of trade as share of GNP, and some other interrelated changes in the economic structure of the countries (Chenery and Syrquin, 1975; Todaro, 1999, pp. 73-78; Todaro and Smith, 2003).

The international dependence theories that emerged in the 1970s argued that developing countries are in a dependence and a dominance relationship with the industrialised countries that either intentionally or unintentionally maintain this dependence (Todaro, 1999, pp. 78-82; Todaro and Smith, 2003). The neo-colonial dependence theory emphasised the unequal power relations between the industrialised and developing countries and argued that underdevelopment is based on conscious or unconscious exploitation, which is perpetuated by a small elite ruling class within the developing countries (Leys, 1975; Todaro, 1999, p. 79). Underdevelopment is thus seen as kind of a continuation of colonial dependency, although the rich countries dominating the developing countries may currently be different – including the rich industrialised countries as well as powerful global financial and other multinational institutions. This international dependence theory seems to have been an early expression of the globalisation theory. It has proved to be valid to some extent, since international trade and business have become so global that developing countries are strongly dependent on the “goodwill” of industrialised countries for getting their share of economic development.

In fact, many developing countries performed fairly well economically in the 1950s, but were dissatisfied with their economic growth prospects in the 1960s. As a result, developing countries started to demand better conditions as formulated in the New International Economic Order (NIEO), whose origins can be tracked back to 1948, but was officially launched in 1973. The NIEO was seeking changes in the international economic and trade system based on 18 key areas that would allow developing countries to establish structures to effectively alleviate poverty and improve national economies (Looney, 1999). Eventually the NIEO proved a failure. Similar demands are still repeatedly made, for instance, at the World Trade Organization (WTO) and the General Agreement on Trades in Services (GATS) negotiations with an aim to rethinking the balance of global trade and economy more in favour of developing countries.

Important international economic decisions still continue to be made in the industrialised countries. Often industrialised countries and ESAs make decisions with good intentions, but in practice accelerate underdevelopment by inappropriate advice in accordance with the false paradigm model (Todaro, 1999, p. 80-81). Although these traditional international dependence theories may not reflect the modern thinking about development very well, the lessons learnt from the massive development assistance during the 1980s and 1990s rather strongly support the validity of the key paradigms of persistent dependence. Despite the existence of this dependence, all economic development problems of developing countries do definitely not depend only on “external factors” – most of the problems are likely “internal”: caused by inadequate resource mobilisation within the developing countries, and especially by inefficient institutional and governance structures.

According to neoclassical theories, the root cause of poor economic development is the inefficient governments of the developing countries themselves. In addition to the governments’ inefficient utilisation of resources, their intervention in markets through price regulation is detrimental. Therefore, development and growth require that these governments apply policies that liberalise markets in all significant economic sectors (Singh, 1994; Todaro, 1999; Todaro and Smith, 2003). Neoclassical economic theories emerged in the 1980s and have to some extent continued their strong hold until current times. The market liberalisation and privatisation policies of the 1990s were clearly based on the neoclassical economic theories. Many ESAs – especially the World Bank – started their strong support of neoclassical theories in the name of the so-called “Washington Consensus”. According to Gore (2000), the Washington Consensus represents partial globalisation of development policy and a shift from historicism to ahistorical performance assessment.

Because most public organisations – including public water and sanitation utilities – in developing countries really have been inefficient and performed poorly, proposals to replace them with market-oriented private enterprises have widely been considered well justified. However, neoclassical theories make several unrealistic assumptions and ignore several crucial issues, as elaborated in Chapter 3.4. For instance, they assume that it is possible and desirable to create a functioning free market and a private enterprise culture in developing countries. Also they ignore the possibility of market failures such as externalities associated with economic growth and the problem of uneven distribution of income (Todaro, 1999; Todaro and Smith, 2003). Thus, the arguments in favour of neoclassical economic theories in the case of water and sanitation infrastructure and services do not stand a holistic analysis, as discussed in Chapter 3.4.

Stiglitz (2001) has strongly criticised neoclassical approaches to development economics. Neoclassical economics provides an inadequate model of developed countries, and therefore a poor starting point for a model for developing economies. Due to the complexity of the world, no single alternative model can explain economic development adequately. According to Stiglitz (2000, 2001), development needs to be seen from a new perspective – as a transformation of society – not just an increase in physical and human capital.

Neoclassical counter-revolution (traditional neoclassical growth theory) emphasised corruption, inefficiency, and a lack of economic incentives within developing countries as the main contributor to the lack of development (Todaro, 1999). The public choice or new political economy approach emphasised inherent government failure and the self-interested behaviour of public officials. Public-choice theory also argued that governments can do nothing right. It further assumed that politicians, bureaucrats, citizens, and states act solely from a self-interested perspective, using their power and the authority of government for their own selfish ends (Todaro and Smith, 2003). Individuals pursue their own aims and act according to their preferences and knowledge. New public management (NPM) has its origins in the public choice theory (Gruening, 2001; Hope, 2001).

Moore (2001) presented his theory of political underdevelopment, which “results from the ways in which developing countries have been created and political authority shaped through interactions with the developed countries” and is thus an outcome of uneven (economic) development. Politically underdeveloped states are also too independent of their own citizens due to: (a) strong external financial and/or military support for the state elites, (b) heavy dependence of states on “unearned income”, and (c) the capacity of state elites and challengers to use control of valuable commodity exports to purchase overwhelming armed force.

Although many of the above-mentioned theories of development have already been discarded – or failed to describe development in a holistic manner – they provide valuable historical lessons that enable us to better understand the current concepts of development. Definitely, sustainable development is currently understood as a much wider issue than mere economic and social development. In fact, recent theories and studies on the development give rise to more diverse considerations. Development is increasingly understood as a wide societal ***governance issue***.

Governance relates to the broad social system of governing, which can be understood to include financial accountability, transparency and administrative efficiency, as well as wider political concerns related to democracy, human rights and participatory processes. Governance can also focus on the match or mismatch between the politico-administrative system and the ecological system or on operation and management of services (Rogers and Hall, 2002, p. 3).

The principles of good governance (Chapter 2.1, Figure 2.3) ensure that most of the issues affecting the internal development potential of developing countries can actually be categorised as governance issues (Figure 3.4). In addition to economic aspects, political, social, technological, environmental and ecological, and legal considerations (PESTEL) have become more important in all sectors of society.

Goulet (1983) also emphasised the role of more humane values and ethics as the main building blocks of alternative development strategies and sounder development theories instead of the earlier emphasis on economics and growth. In the 1990s and beginning of the 21st century, new development economics thinking has made a strong breakthrough, while the neoclassical and neo-liberal streams also continue strong. Stiglitz (2000, 2001) and Lim (2001) have described the new thinking in development economics. It consists, for instance, of the following (Lim, 2001):

- The role of global and regional institutions and environment
- Development theories applied to a particular setting and context and linked to institutions and governance structures
- Social and distributive policies as economic empowerment
- Linkages with mainstream and non-mainstream economics.

As earlier noted, “poverty” is currently seen as a much wider issue than lack of economic wealth. Similarly, **human development** is seen as “creating an environment in which people can develop their full potential and lead productive, creative lives in accord with their needs and interests” (UNDP, 2003). Amartya Sen has contributed much to the concept of human development. Sen’s (1989) theory of development as capabilities expansion is the starting point of the human development approach (HDA): the purpose of development is to improve human lives, and a person’s functionings and capabilities. The Human Development Report 2003 measures the progress of various nations by key social and economic indicators. It shows that 21 countries had a decline in their human development index (HDI)² in the 1990s, including Kenya (UNDP, 2003). In Kenya, access to social, economic and political opportunities is far from equal. The Kenyan Human Development Report 2001 probes these inequalities to discover the main causes, looking at income and employment, social development and access to social services (UNDP, 2001). The human development situation in Kenya has declined since 1990 with a fall in life expectancy, per capita income and school enrolment. There are also great regional variations in HDI. Kenya is number 146 among the 175 countries of the Human Development Report 2003 (UNDP, 2003).

The Human Development Report 2003 identified 59 priority countries in which – unless urgent action is taken – the MDGs cannot be met. Kenya is among the 31 “top priority” countries where income and other human development indicators remain very low and progress towards the goals has stopped or started to reverse. On average, Sub-Saharan Africa has a poor record of meeting MDGs regarding water and sanitation. Development regarding sanitation access shows a reverse trend and MDGs for access to safe water could only be achieved some time between 2020 and 2050, instead of the targeted 2015 (UNDP, 2003).

² The human development index (HDI) is an aggregate measure of human development, measuring the average achievements in three basic dimensions: (1) A long and healthy life (longevity), as measured by life expectancy at birth; (2) Knowledge, as measured by the adult literacy rate and the combined primary, secondary and tertiary gross enrolment ratio; and (3) A decent standard of living, as measured by GDP per capita. There are about 356 human development indicators arranged according to 30 main themes based on the three basic dimensions of human development. (UNDP, 2003).

While recognising the increased need for development assistance, attention should be paid to the nature and quality of assistance, in order to avoid reverting back to the symptoms of the international dependence theories discussed above. Hence, issues of good governance are essential in improving the quality and effectiveness of assistance. Developing countries for their part should (1) strengthen institutions in line with the rule of law and good governance, (2) provide wider access to various social and infrastructure assets, and (3) introduce transparency through open and verifiable flow of information (UNDP, 2003). ESAs have already adopted more participatory and holistic approaches for the medium term. Yet, a long-term visionary approach to development strategies is also urgently needed.

The more holistic approaches to development adopted during recent years have often meant more integrated interventions both in development assistance programmes of ESAs and developing countries themselves. Poverty reduction strategy programmes (PRSPs) have become an essential part of development strategies. PRSPs usually apply a holistic approach to poverty and resource mobilisation and also carefully monitor the impacts on the poorest members of society. Despite the merits of PRSPs, water and sanitation strategies often still feature weakly in them. Perhaps the role of water and sanitation as an essential entry point to development has not yet been adequately understood in this connection.

Recent holistic approaches to development include several national, regional and global partnership efforts, which aim at merging various aspects of poverty alleviation and governance into a multi-sectoral and integrated socio-economic development framework. An example of such regional partnerships is the New Partnership for Africa's Development (NEPAD). NEPAD aims at addressing current development challenges on the African continent and developing new radical interventions to develop and implement the new Africa Vision (NEPAD, 2003). Regarding WSS development, NEPAD is preparing its water programme based on the Africa Vision and Framework for Action that provides a foundation for addressing the challenges in meeting the MDGs in Africa. As mentioned earlier, the prospects of achieving MDGs in WSS in Sub-Saharan Africa seem extremely challenging. NEPAD has also received a lot of critique from professionals.

In conclusion, comprehension of the challenges and problems of development has significantly evolved during the last few decades, resulting in recognition of the complexity and interdependence of issues. However, the role of water and sanitation as a potentially spearheading entry point to overall development has not yet been adequately stressed. Also the fundamental and diverse characteristics of water and sanitation services as both social and economic goods and the importance of economic infrastructure have to some extent been forgotten. This is evidenced by the recent neoclassical and purely market-oriented approaches of unsubstantiated reliance on sublime expectations from private sector resource mobilisation to solve global water and sanitation problems, while subjecting water resources to market speculation and ignoring the detrimental impacts on the poor. In contrast to neoclassical economic approaches to water and sanitation development, more comprehensive institutional approaches have taken the broad and interdependent aspects of development better into consideration.

3.4 Institutional development approach

3.4.1 Evolution of institutional theories and approaches

As concluded in Chapter 3.3, most economic development theories – including the neoclassical and contemporary ones – do not provide a comprehensive view of the development and performance of organisations. So-called institutional approaches provide a more holistic view also of the complex and interdependent problems of water and sanitation services development.

The “old theories of economic policy” emerged mainly in the 1940s. These represented economic systems or sectors by structural models, and subsets of variables were defined either as instruments or targets of economic policy (Eggertsson, 1997). These theories resemble the development economics theories described in Chapter 3.3. “Classical” economic theories – before neoclassical economics – were actually to some extent both evolutionary and institutional by nature. The formal evolutionary and neoclassical economic theories did not adequately consider institutions and explain their existence.

The weaknesses of neoclassical economics in recognising institutions and the organisational nature of firms led to research on market failures and company hierarchies. Consequently, institutional approaches to economics were developed in the United States after the Second World War as a criticism of “orthodox” economics. Their main differences with neoclassical economics are the following (Klein, 2000, pp. 456-457):

- 1) A focus on collective rather than individual action,
- 2) A preference for an “evolutionary” over a mechanistic approach to the economy,
- 3) An emphasis on empirical observation over deductive reasoning.

Thus, institutional economics differs from the main stream of economics and economic development theories discussed in Chapter 3.3 by emphasising (i) that the economy is more than the market, (ii) that the economy has to be studied evolutionally, and (iii) that in addition to studies on individual problems it is also important to study group problems, forces and processes (Samuels, 1988). Besides, the institutional approach includes both technology and individual tastes and preferences. According to Hodgson (1988), the economy is inseparable from social and political institutions (Figure 3.5).

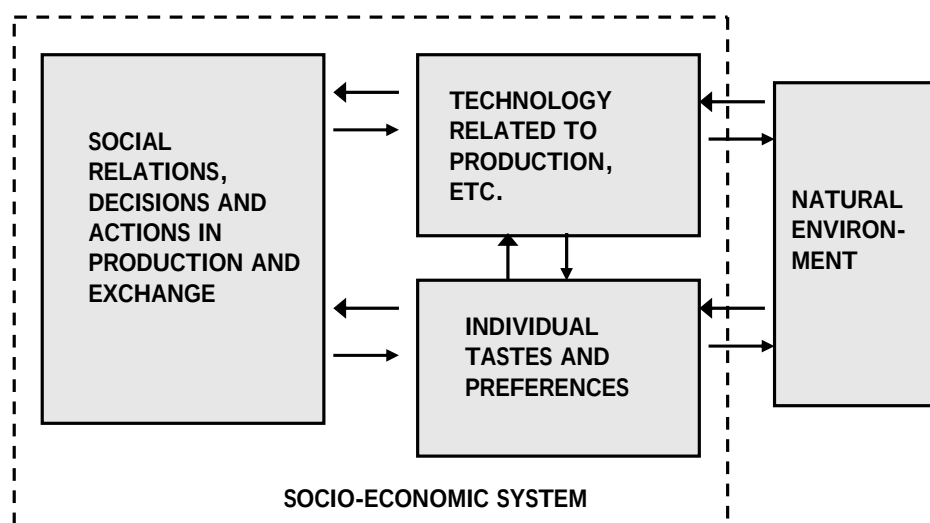


Figure 3.5 *Institutional approach to social and economic systems (Hodgson, 1988).*

Neoclassical economics evaluates institutions based on their market-like properties, assuming perfect competition in the market and that business is conducted rationally with buyers and sellers of products or services in possession of complete information (North, 1990). Institutional economics, on the other hand, considers also transaction costs; hierarchies and incomplete competition; incomplete, insecure and asymmetric information; and bounded rationality of individuals (Williamson, 1985; Williamson and Masten, 1999). Institutional economics emphasises the principle of instrumental value, which includes the same elements of thinking as sustainability (Livingston, 1993). Institutional economics recognises no first principle for the form of institutions. The public-private sector mix resulting from the institutional change is regarded as incidental – there is no *a priori* prejudice to public or private solutions (Livingston, 1993).

Institutionalism has evolved from the original “old institutional economics” (OIE) to the “new institutional economics” (NIE). Like OIE, NIE is also interested in the social, economic and political institutions that govern everyday life. However, NIE is not trying to be as holistic and “anti-formal” as OIE, which considers many social, cultural and political factors affecting economic performance (Klein, 2000, p. 457; Rutherford, 1994, 1995). OIE relies on methodological collectivism, where aggregate economic outcomes depend heavily on the distribution of resources among individuals (Livingston, 1993). NIE is based more on methodological individualism – like neoclassical economics – and emphasises more the goals, plans and actions of individuals (Klein, 2000, p. 457). Yet, NIE recognises public interest better than neoclassical economics, and appreciates social phenomena such as corporate culture and organisational memory.

The actor-oriented approach to institutional theory was based on the assumption that the individual is a rational and selfish actor (Wegerich, 2001). Nowadays it is recognised that humans (and organisations) have a bounded rationality in their decision making (Article V). Structure-oriented approaches argue that structures determine the environmental perception of individuals (Wegerich, 2001).

An important difference – very relevant to water and sanitation services – is that neoclassical economics judges economic outcomes and performance mainly on the basis of economic efficiency, while institutional economics emphasises consideration of several normative criteria as will be elaborated later. Institutionalism also embraces the notion of instrumental value. Value is tied to continuity of human life and the non-invidious recreation of community. The thinking behind instrumental value is very similar to that behind sustainability (Livingston, 1993).

Institutional development theories were largely used in the synthesis of this dissertation, especially as regards management of water and sanitation services at the utility level and also with respect to institutional change in the sector reform process. The institutional theories applied in this research adhere mainly to the concepts defined within the new institutional economics (NIE) theories, although they cover a diversity of disciplines and theories, such as organisational theories, institutional economics, institutional change, and institutional assessment approaches. The author believes in a potential convergence of old and new institutional theories, which is sometimes referred to as “neo-institutionalism”. If the symbolic elements and attention to power associated with the old institutional economics can be combined with the new institutional economics’ cognitive insights and attention to legitimacy, institutional theories can provide a good foundation for understanding the relationship between organisations, their strategies and their institutional contexts (Lawrence, 1999, p. 162). Moreover, integrated and coherent application of elements of both institutional economics and neoclassical economics is also possible and beneficial.

The term new institutional economics (NIE) was originated by Williamson (1985). Other well known representatives of the NIE include Ronald Coase, Herbert Simon, Armen Alchian, and Douglass North. Yet, the distinctions between different schools of economists are not very clear. For instance, many economists who consider themselves neoclassicists – including North – have used elements of institutional analysis.

3.4.2 Key concepts of institutional economics

The most important concepts, theories and elements of institutional economics which also largely contribute to this dissertation are: (1) institutions, (2) organisations, (3) institutional change, (4) transaction costs, (5) property rights, (6) principal – agent theory, (7) vertical integration, (8) moral hazard or agency theory, (9) path dependence, and (10) organisational memory.

Institutional terms and concepts are often used in an unclear manner. Different schools of economic and management science – for instance neoclassical and institutional economics – use different definitions and concepts even for the same phenomena. In the following, some of these key concepts and contributions of institutional economics are discussed – mainly from the viewpoint of their importance to water and sanitation services.

Institutionalism makes a clear distinction between **organisations** and **institutions**. In the older thinking, and confusingly also often today, the term institution is used to mean organisations or organisational actors (Khalil, 1999; Rantama, 2002). Actually, the organisation is a difficult concept to define precisely (Tuomi, 1999, p. 221). According to North (1990), organisations are like players in a game, while institutions are like the rules of the game. Box 3.2 shows some of the common definition and features of organisations and institutions.

Box 3.2 *Selected definitions and features of organisations and institutions (Sources: Challen, 2000; Hukkinen, 1999; Kasper and Streit, 1998; Livingston, 1993; North, 1990; Robbins, 1990; Tuomi, 1999; Wegerich, 2001; Williamson, 1985).*

ORGANISATIONS:

- Are groups of individuals bound to some common purpose to achieve objectives (*North, 1990, p. 4*).
- Are consciously coordinated social entities, with relatively identified boundaries, that function on a relatively continuous basis to achieve a common goal or set of goals (*Robbins, 1990, p. 4*).
- Provide a structure to human interaction (*North, 1990*.)
- Can be agents of institutional change (*North, 1990*).

INSTITUTIONS:

- Are rules of the game in a society (*North, 1990*).
- Are humanly devised constraints that shape human interaction (*North, 1990*).
- Are frameworks within which human beings interact (*Wegerich, 2001*).
- Structure incentives in human exchange (political, social or economic)
- Reduce uncertainty by providing a structure to everyday life (*North, 1990*).
- Can be formal or informal (*North, 1990*).
- Are set of rules, compliance procedures, moral and ethical behaviour norms.

According to North (1990), institutions – both *formal* and *informal* – and institutional incentives are the underlying determinants of the long-run performance of economies. Institutions determine (i) the power relations between the administration and citizen, (ii) equity distribution between citizens, and (iii) have an indirect effect on social and economic livelihood (North, 1990). Thus, institutions are also *social resources* that determine relations of individuals, groups and organisations (Wegerich, 2001). Institutions can also be considered as part of *social capital*. Besides being formal and informal, institutions can also be categorised as (i) operational, (ii) collective choice, and (iii) constitutional choice institutions. Institutions are problem-simplifying devices, because individuals delegate their decision-making processes to institutions (Wegerich, 2001, p. 7). Effective institutions are *incentive-compatible* (World Bank, 2001, p. 6). Institutions with internal enforcement mechanisms are effective because of the mutually recognised system of rewards and penalties.

Institutions related to water and sanitation services can be broadly categorised as: (i) policies, (ii) legislation and regulations, (iii) administrative structure, and (iv) informal institutions (Chapter 3.1, Figure 3.2; Article I). Organisations are the actors and stakeholders performing their specific roles at various stages of the service chain.

The role of informal institutions is significant for the performance of organisations and institutional change in the reform process, as elaborated in Chapter 4.2.1 and Article I. These informal institutions include (i) rules that are not explicitly created by collective action and not formally implemented by enforcement organisations, (ii) norms and conventions that do not have legal status but should be followed by all actors, and (iii) behavioural codes, attitudes and other ethical standards of conduct (Eggertsson, 1997; North, 1990).

Institutional environment means the background constraints that guide individual and organisational behaviour – based on both formal and informal institutions (Klein, 2000, p. 458). ***Institutional arrangements*** are the structured set of linked or interdependent institutions, which comprise the social system of the economic, social and political domains – and guidelines or governance structures through which decisions are implemented (Adger et al, 2003; Aoki, 2001; Klein, 2000). The institutional environment, institutional arrangements, and organisational actors (individuals, agencies, and organisations) comprise the ***institutional framework*** – the totality of institutions – in which decisions are made and implemented (Adger et al, 2003; Klein, 2000; North, 1990). Thus, an institutional framework is essentially a human activity system (Hukka, 1998; Chapter 3.6.5). Figure 3.2 shows the author's conception of the institutional framework for urban water and sanitation services system. In this conception, informal institutions are also considered social resources, and the administrative structure includes both institutions and organisations as resources.

If the present institutional framework does not function properly – that is, it does not provide an enabling environment for the human activity system and its actors to perform successfully – there is a need for ***institutional change***. Institutions themselves also change over time and often respond to economic factors (Rutherford, 1995, p. 443). As discussed in Article I, institutional change is a crucial element in the reform process – triggering the reform process. Institutional change is a complicated process, which may have several reasons (Challen, 2000; Livingston, 1993; North, 1990; Wegerich, 2001).

Institutional change depends on (i) the stability of institutions, (ii) the sources of changes, (iii) the agent of change, and (iv) the direction of change and path dependence (North, 1990; Article I). Organisations and institutions interact, and evolvement of organisations may also alter institutions. Individuals and organisations establish institutions based on their incomplete information, but new information may trigger institutional change. Institutional change may also occur when a sufficient number of individuals are able to disrupt the institution. The power position of the individuals is important. Changes in the role and position of stakeholder groups can also cause the change (Wegerich, 2001). Institutions change when benefits to stakeholders are high, and when changes do not threaten their interests. Different stakeholder groups have different interests.

Every institution is subject to influences and thus to change, and changes may be either intentional or unintentional. As discussed in Article I, institutions may often change as a result of conflict or crisis. Thus, *chaos theories* could provide interesting contributions to the concept of institutional change. Water institutions and organisations in developing countries are often *bureaucratic* and top-down oriented. Thus, their resistance towards change may naturally be high.

Institutions can change gradually, step by step, or in sudden leaps. According to Aoki (2001), the institutional framework can change as a result of (i) random shocks to the social system or (ii) major exogenous changes in the actors' objective choice sets – such as introduction of new technologies or policies from abroad – or in the actors' subjective choice sets due to their bounded rationality. Nelson and Sampat (2001) consider that institutional change is to a large extent induced by other changes in the way that economic activities are performed. Thus, it is seen as a gradual cultural evolutionary process, involving a lot of trial and error and learning from mistakes.

According to North (1990), the tension between formal and informal institutions drives institutional change (Article I). Institutions resist the change, and informal institutions are usually more resilient than formal ones (Hukkinen, 1999; Article I). Legislation and regulations are relatively easy to develop and enforce, but ensuring stakeholders' compliance with them is much more difficult. Especially in developing countries the formal institutions – such as water legislation and administrative structures – may look adequate, but in practice their compliance and performance is often very poor.

Institutional change focuses on the rules and processes that govern relationships between organisations and the public, and between different organisations (North, 1990; Ostrom, Schroeder and Wynne, 1993; Wegerich, 2001). Wegerich (2001) has identified three levels of institutional change: (i) institutional change, (ii) organisational change, and (iii) process change (re-engineering). There are two different approaches to institutional change: (i) demand-induced institutional change (“co-operative”), and (ii) supply-induced institutional change (“imposed”) (North, 1990; Wegerich, 2001). The *demand-induced* institutional change (“bottom-up change”) typically consists of marginal adjustments to the complex of rules, norms, and enforcement mechanisms that constitute the institutional framework (North, 1990, p. 83). North (1990) believes that institutions typically change incrementally rather than at once, and the change is also path dependant. Information links technological change and institutional changes.

According to some exponents of institutional economics, the main reason for institutional change is minimisation of transaction costs and increased efficiency. However, North (1990) rather supports demand-induced change and refuses the idea that institutional change is an attempt to increase efficiency. Inefficient institutions remain unchanged if

they have the necessary support. Dysfunctional institutions may stay in place either because of path-dependency or imperfect information about future gains. Reducing the uncertainty about the future should thus enable institutional change through better elaboration of the future gains. *Supply-induced* institutional change is imposed “top-down” or “outside-in”. It can also be induced from above, within the institution, or from the outside. According to North (1990), institutional changes are caused by the relationship between organisations and institutions, and competition for the limited economic resources. *Competition* forces organisations to invest in the most useful knowledge in the current institutional environment. Similarly, *organisational behaviour* also changes institutions (Chapter 3.4.4).

Wegerich (2001, p. 24) points out the significance of institutional change for policy making and management institutions. *Common pool resources* – such as water in some cases – can be managed at the local level only if the main stakeholders are involved in the making and implementation of the policy. These structures have to be mediated so that old stakeholders cannot take advantage of the new institution in reinforcing their power position. Mediation may come from the grassroots or from top-down initiatives. Wegerich’s ideas conform to the findings presented in Article I on the role of institutional change and requirements for a successful policy reform process.

Fundamental institutional changes for reforming the water sector may be achieved through an integrated approach through inter-dimensional synergy. Institutional changes can occur when the opportunity costs – or the potential net gains – of the institutional change are increasing to surpass the corresponding transaction costs (Saleth and Dinar, 1999).

Although the concept and drivers of institutional change are not very clear and researchers seem to have different views, a synthesis can be made with regard to water resources and water and sanitation services. Figure 3.6 summarises the above mentioned drivers for institutional change and describes the transformation process of institutions in water sector reform.

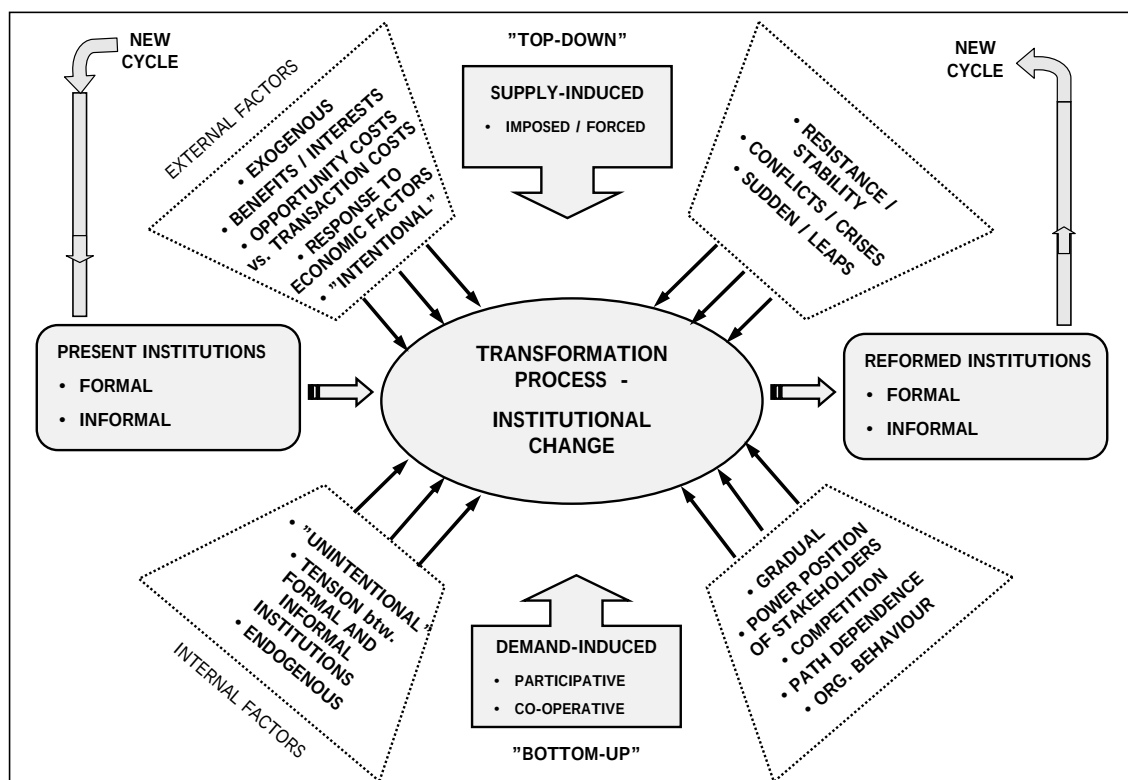


Figure 3.6 Institutional change as a transformation process and factors affecting it.

Livingston (1993) has presented a positive, descriptive model of institutional change with a view to water resources management. Her fundamental methodological question concerns the grounds upon which alternative water institutions should be evaluated. The ultimate function of economic systems and the institutional arrangements upon which they rest is the survival and well being of both individuals and the system over time. Desirable resource allocation policies are defined as those that foster the long-term *viability* of both economic and environmental systems. Good public policies lead to aggregate outcomes that promote individual welfare.

According to North (1990), institutional change arises from the actions of individuals, which in the model are categorised as private entrepreneurs and political entrepreneurs. Thus, institutional change is a continuous, cyclic process. Challen (2000) has further interpreted North's (1990) model on institutional change. In Challen's (2000) conceptual model of institutional change, the agents with the decision-making power over institutional change are the political entrepreneurs while the agents subject to the institutional change are the economic entrepreneurs.

Figure 3.7 presents the author's view of a potential model of institutional change in water resources management which combines Livingston's (1993) and Challen's (2000) descriptive models.

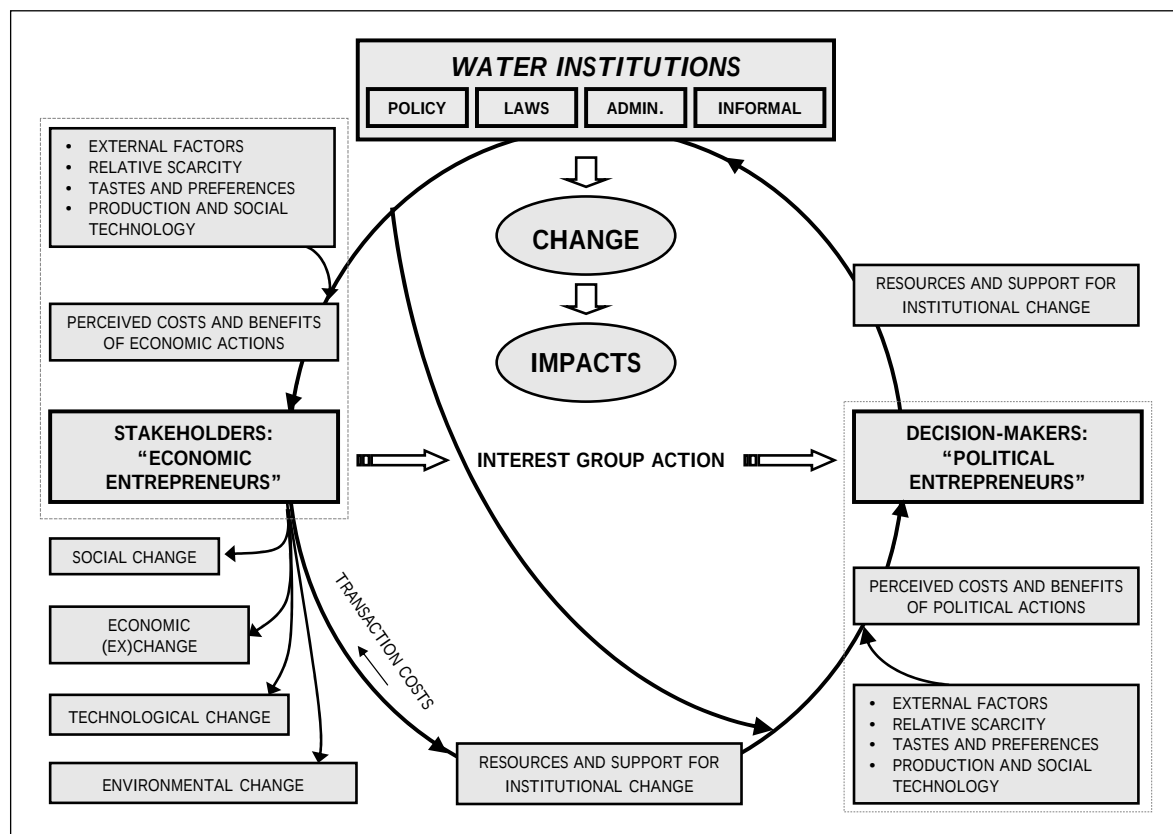


Figure 3.7 Conceptual model of the cyclic institutional change in water management (modified from Challen, 2000 and Livingston, 1993).

A dominant stream of new institutional economics is **transaction costs economics** (TCE). TCE emphasises the importance of **transaction costs**, which are unavoidable in all production or service activities. They are in a way the “friction of the economic system” or “costs that are caused by the operation of the economic system”. The costs of service production are the sum of transformation (production) and transaction costs (Williamson, 1985; Williamson and Masten, 1999; Article II).

The concept of transaction costs was used already in neoclassical economics, but in a different and narrower sense than in NIE. In neoclassical economics transaction costs were mainly understood as transportation charges or taxes related to production or business activities (Allen, 2000, p. 894). In NIE, transaction costs include costs resulting from the time and efforts spent in: (i) all business transactions – including efforts to organise trade, search buyers through advertising or marketing, (ii) organising transportation and logistics, (iii) preparing contracts and agreements, (iv) arranging financial transactions, (v) establishing, maintaining and protecting **property rights** – including inspection, enforcing, policing, and measuring –, and (iii) exchanging or transferring property rights (Kasper and Streit, 1998; Lamberg and Ojala, 1997; Williamson, 1985).

Property rights are in this research understood to cover both ownership and management of assets, right to use the resources, and right to use the services and goods. In the neo-classical economics and often also in NIE, the term “property right” is often used as a synonym for “institutions” related to individual “ownership”. Allen (2000) defines property rights as “the ability to freely exercise a choice over a good or service”. Similarly, Challen (2000) limits the term property right to describing the nature of the decision-making entity holding the rights pertaining to the use of a resource. In the case of water resources, property rights and the right to use can be categorised as: (i) state property, (ii) private property, (iii) common property, and (iv) open access property (Challen, 2000, p. 21; UNESCO, 2003, p. 375). It should be understood that depending on the type of water services system and management arrangements, water resources can actually be categorised under several characteristics of goods and property rights. For instance, on-site water systems are private goods while public water supply systems are in most cases club or tolls goods, and water from a public spring may be regarded as a common pool resource.

One of the key suppositions behind transaction costs is that adequate information related to economic and business transactions and contract relationships are costly and difficult to obtain. Transaction costs include the costs of searching for market information: finding a sufficient number of exchange partners, their location, product design, quality, reliability and numerous other relevant aspects prior to making a decision. They also include the costs of negotiating, concluding and monitoring and enforcing the fulfilment of contracts and possibly dealing with contract breaches and their arbitration. Transaction costs also include losses caused by poorly prepared plans and contracts. The “sunk costs” of information search and preparing contracts are incurred prior to transaction decisions.

According to Williamson (1985), the company’s relationships with suppliers, customers, shareholders and staff are explicitly or implicitly bound by contracts or agreements in transaction costs theory. Contracts have various levels of insecurity depending on the conditions of business transactions. The key criteria are **asset specificity**, insecurity and small number of contract partners. Human economic behaviour is characterised by bounded rationality and opportunism. Asset specificity is the most important reason for hierarchical management of transaction costs (Williamson, 1985). It means the relationship between (i) transactions and property value and (ii) specific nature and stability of the business relationship. **Bounded rationality** and insecurity are caused by limited human ability to handle and use information, and it is manifested, for instance, in incomplete information about business partners.

Although the term transaction costs is widely understood, there are other less familiar costs that contribute to the costs of owning and using property rights, as shown in Figure 3.8. Yet, some authors use the term transaction costs to designate all co-ordination costs. Co-ordination costs include transaction costs and organisation costs. When property rights are used actively, that is, when they are exchanged or combined with property rights in production factors held by others, co-ordination costs arise in addition to exclusion costs (Kasper and Streit, 1998, pp.196-197).

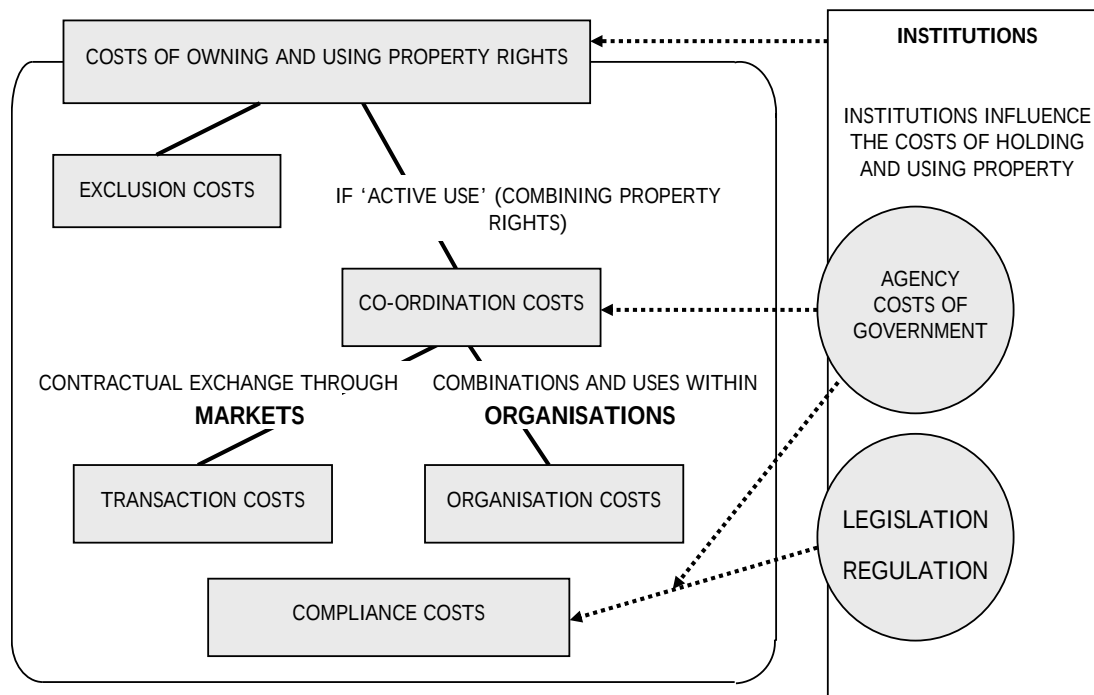


Figure 3.8 Transaction costs' share of the costs of owning and using property rights (modified from Kasper and Streit, 1998).

Transaction costs are important in analysing the performance and efficiency of the public and private sectors in ownership and management and for exploring the likely performance of long-term contractual relationships. Transaction costs are a key factor in determining whether it would be more economic and efficient to produce a service yourself or to use outside resources (outsource). Therefore, all transaction and co-ordination costs of private sector participation need to be fully accounted for while assessing effectiveness. In a service provider-producer model transaction costs mean the costs of interaction between the public client and the private supplier. These costs include tendering, tender evaluations, negotiations, contract preparation and supervision, co-ordination, and arbitration. Figure 2 in Article II (p. 49) shows a typical example of very complex and costly transactions in privatised sewerage arrangements in United Kingdom.

In privatisation of services, the private service producers tend to aim at minimising the substantial transaction costs by arranging them internally through **vertical integration** as described in Article II. Besides minimising transaction costs, vertical integration aims at obtaining full control over the entire production and service chain and thus minimising competition and achieving a dominant market position. A better policy for improving competitiveness is to widely outsource the non-core activities and services on a competitive basis.

As elaborated in Chapter 4.2.2 and in Article II, vertical integration and artificial reduction of competition are disadvantageous from the customers' point of view and makes overall sector development difficult. Attempts to reduce transaction costs through long-term contracts have similar adverse effects on competition, and long concessions by foreign operators can cause severe losses to the local capacity of water service organisations in developing countries, as discussed in Chapter 4.2.1.

One of the concepts of NIE is the *principal-agent theory*. The original conception of the principal-agent theory was related to business relationships between the firm and its client, or between companies. The agent is an individual that acts on behalf of another, the principal. In the case of water and sanitation services, this theory is still valid at two different levels.

At the policy level – looking at developing countries – the dominance of ESAs seems to adhere to the principal-agent theory both in sector reform and policy formulation as well as at the practical programme intervention level, as described in Article I and in Chapter 4.2.1. External advisors have too often taken the lead in planning and implementation and consequently the capacity and knowledge of local decision makers and managers has gradually been lost.

At the water utility level, the client-producer model may lead to a similar situation, in which the client gradually loses most of the essential information needed to manage the utility's operations. Usually this means that the role of the public utility evolves to a public client, which delegates service production to a private operator. This may be a good management option as such, but in practice it often constraints future arrangements. The public client gradually loses its capacity to manage the services, and the private operator gradually becomes an agent that can manipulate the principal with regard to strategic decisions due to superior *asymmetric information* about the system it has operated. In the case of long-term contracts the agent also achieves a superior competitive position, which may lead to consecutive contract periods and practically fictitious market competition.

NIE also uses the concept of *moral hazard* or *agency theory*, which refers to the temptation that individuals in decision-making positions may behave in a way that allows them to gain personally from their action (Klein, 2000). Moral hazards occur when the principal and agents do not have aligned interests and the agents choose inefficient and inappropriate action in order to pursue personal interests. These kinds of risks could potentially occur in water services management – both public and private. If ownership and strategic management are in the same hands with service production, the risk of pursuing personal interests and economic gains is obvious. On the other hand, several examples from both industrialised and developing countries confirm that substantial moral hazard and *opportunism* exist also in contract arrangements between a public client and a private supplier. Corruption and “unofficial incentives” are a widely spread symptom of misbehaviour and poor governance.

As mentioned, long-term contracts can constrain future strategic decisions. Water and sanitation services require very long-term considerations due to their various characteristics (discussed in Chapter 3.5) and as they are capital-intensive infrastructure. Thus, important strategic decisions have their long-term impacts and constrain, limit or postpone future decisions accordingly. NIE embraces the term *path dependence*, which initially was applied to historical choices of specific technologies and the subsequent “lock-ins”, but later it was extended to include social institutions – especially informal institutions (Eggertsson, 1997, pp. 1198-1199). Path dependence is closely related to *organisational memory*, which has been elaborated in Article V and Chapter 3.4.4.

3.4.3 Normative criteria of institutional economics and their applicability to water and sanitation services

Normative criteria in economics are “norms” on the basis of which certain possible outcomes – results of economic decisions – are judged. Institutional economics uses a wider diversity of criteria than other contemporary economics, including the following: (i) efficiency and its several components, (ii) effectiveness, (iii) efficacy, (iv) equity, (v) equality, (vi) legitimacy, (vii) justice, (viii) accountability, and (ix) ethics. In addition, NIE considers various other externalities in addition to economic criteria, and also emphasises concepts such as social capital.

The performance of organisations can be assessed against three main factors: (1) performance in activities that support the mission (**effectiveness**), (2) performance in relation to the resources available (**efficiency**), and (3) performance in relation to long-term viability or sustainability (**adaptability**) or long-term effects or working impacts (**efficacy**) (Lusthaus, Anderson and Murphy, 1995). Box 3.3 describes these concepts based on the most basic principles of institutional economics.

Box 3.3 Concepts of efficiency, effectiveness, and efficacy (Sources: Israel, 1987; Kraemer, 1998; Lusthaus et al, 1995; North, 1990).

EFFICIENCY:

- Measures performance in relation to available resources (*Lusthaus et al, 1995*). Ratio of output to input of any system.
- Refers to the way in which resources are used to achieve the objectives (*Israel, 1987*).

EFFECTIVENESS:

- Measures performance in activities that support the mission (*Lusthaus et al, 1995*).
- Indicates how well an organisation is doing relative to its own set of standards (*Israel, 1987*).

EFFICACY:

- Measures the long-term impacts and sustainability of the activities – how things work. Capacity to produce desired effects.

Efficiency has typically received the most attention in the measurement of economic performance, although it is usually narrowly limited to economic efficiency and maximisation of welfare (Adger et al, 2003). Effectiveness is a broader concept than efficiency. Effectiveness includes the capacity of an organisation to define and agree on its appropriate operational objectives (Israel, 1987). *Organisational effectiveness* is relative to the location, activity, and technology of the institution or organisation (Israel, 1987, p. 12). *Organisational effectiveness* means the organisation’s ability to produce and achieve acceptable products and outputs from the asset owner’s perspective. It measures how well the organisation fulfils the requirements and objectives of its important interest groups. *Organisational efficiency* measures at the operational level how well things have been managed on the basis of the input – output ratio. If organisational efficiency is high, it also improves organisational effectiveness. However, if organisational effectiveness is poor, organisational efficiency cannot improve it (Kallio, 1994, p. 165). Organisational efficiency depends mainly on transaction costs (Williamson, 1985; Tyson and Jackson, 1992).

Efficiency is a diverse concept, and misleading argumentation is often used when different institutional and management options of water service provision are compared (Articles I and II). At least the subcategories of (1) *allocative*, (2) *adaptive*, (3) *economic*, (4) *operational*, (5) *technical*, (6) *static*, and (7) *dynamic* efficiencies are commonly considered. Assessing efficiency based on the production function depends on the criteria. Box 3.4 presents some of the main features and differences of various efficiency elements.

Box 3.4 *Definitions and features of various efficiency criteria (Sources: Braadbaart, 2002; Israel, 1987; North, 1990; Todaro, 1999; Willner, 1997).*

ALLOCATIVE EFFICIENCY:

- Is concerned with producing the maximum output with given inputs using cost-minimising techniques of production (*Todaro, 1999*).
- Deals with allocation of resources through prices, markets and administrative interventions (*Israel, 1987*).
- Adheres to standard neoclassical (optimal Pareto) conditions and assumes perfect free market situation.

ADAPTIVE EFFICIENCY:

- Describes the ability of institutions to innovate, continuously learn, productively change and develop through time (*North, 1990*). Emphasises flexibility and adjustability (re: dynamic efficiency).
- Provides the incentives to encourage the development of decentralised decision-making processes that will allow societies to maximise the efforts required to explore alternative ways of solving problems (*North, 1990, p. 80*).

ECONOMIC EFFICIENCY (cost efficiency):

- Is concerned with producing the maximum output using cost-minimising techniques of production and considering effective market demand (*Todaro, 1999*).
- Emphasises costs, but usually neglects economic (and non-measurable) worth / values (*efficiency should be based on worth / cost- ratio*).

OPERATIONAL EFFICIENCY:

- Deals with maximising the use of labour and capital through sound management of enterprises, projects, and programmes (*Israel, 1987*).

TECHNICAL EFFICIENCY:

- Is concerned with producing the maximum output with given inputs and existing technology, without regard to effective market demand (*Todaro, 1999*).
- Only requires that the company's production is set on the production function, which describes technical output/input but not economic behaviour (*Willner, 1997, p. 31*).

STATIC EFFICIENCY:

- Is related to internal ownership effects of the organisation (*Braadbaart, 2002*).

DYNAMIC EFFICIENCY:

- Considers timing of benefits and costs and not only magnitude, and is affected also by external factors such as market forces, competition, and operational environment (*Braadbaart, 2002; Kraemer, 1998; Willner, 1997*).

To achieve its management goals, a water utility needs to strive for high efficiency and effectiveness. Efficiency means the extent to which the resources of a water undertaking are utilised optimally to produce the service. Effectiveness means the extent to which declared objectives – specifically and realistically defined – are achieved (Blanchard, 1996).

Blanchard (1996, p. 82) considered further the relationships between effectiveness and efficiency. Effectiveness is related to the organisation's vision and direction, focusing the organisation's energy in a particular direction. Efficiency is more related to actual implementation: the systems and procedures by which activities are done. Blanchard (1996) referred to Dick Ruhe's two-dimensional LEAP model on efficiency and effectiveness, which includes four combinations of effectiveness and efficiency (Figure 3.9).

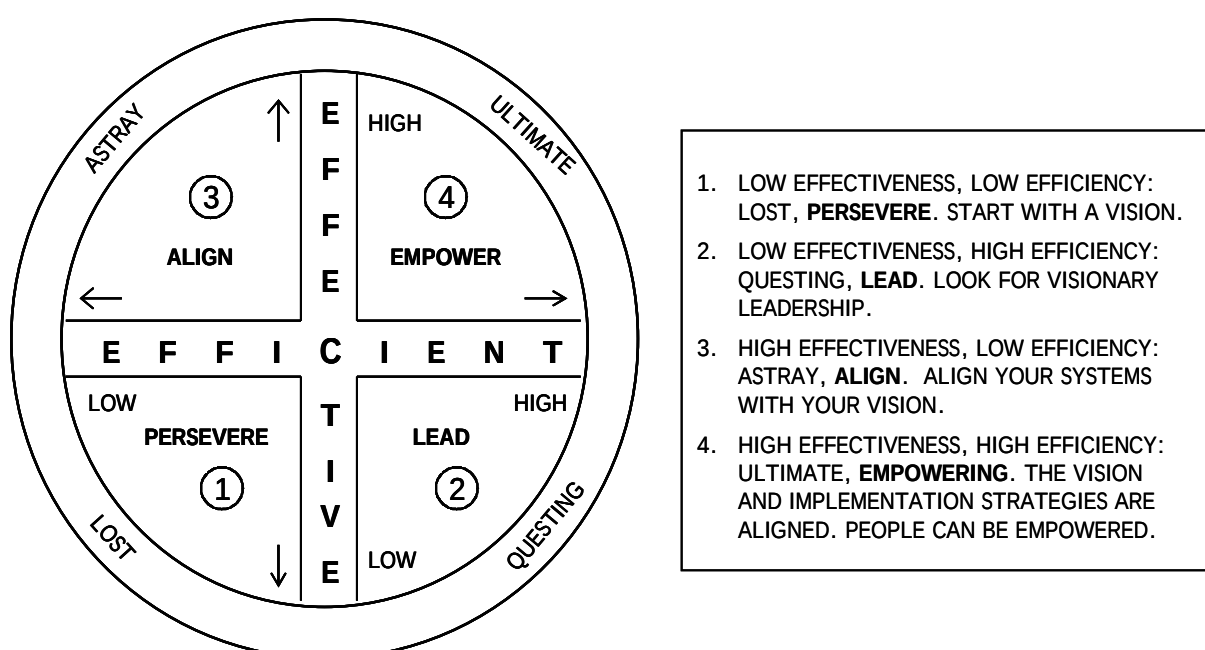


Figure 3.9 Four combinations of effectiveness and efficiency (modified from Blanchard, 1996, p. 82).

An organisation's efficiency can also be viewed from different stakeholders' angle. Both *internal* and *external* efficiency should be considered (Kallio, 1994, p. 165; Kamensky, 2000). Internal efficiency is related to the organisation's internal production processes and their (economic) efficiency, while external efficiency describes the organisation's relations to its operational environment. For water utilities, this refers essentially to the customer interface. A water utility's viability (Chapter 2.1; Box 2.1) consists of several components of service level and efficiency and depends on both internal and external effectiveness and efficiency (Figure 3.10). Service quality, on the other hand, depends mainly on other quantitative and qualitative criteria that are much more diverse than merely economic criteria.

In addition to issues related to the customer interface, efficiency should also cover economic externalities that in water services also include aspects related to the environment and safeguarding water resources, as elaborated in Article III.

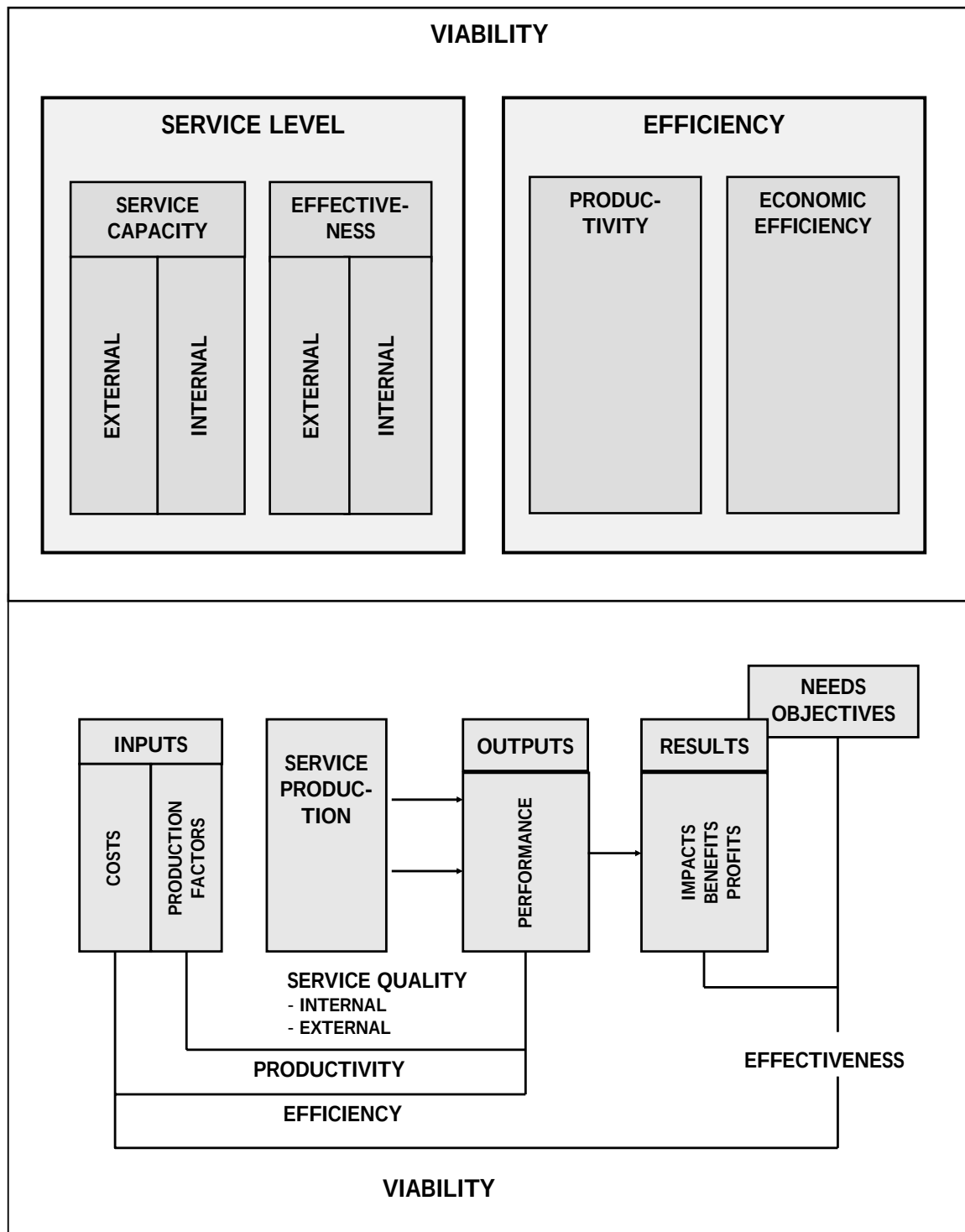


Figure 3.10 Elements of efficiency, effectiveness and viability in service production (Suomen Kaupunkiliitto and Efektia, 1993).

Argumentation on the performance and relative superiority of private versus public operation and management of water services has to a large extent been based on economic efficiency criteria. This reflects the narrow neoclassical conception of the relevant performance criteria. Institutional economics emphasises a broader use of normative criteria as mentioned above.

Effectiveness should be looked at from a wider perspective than economic and technical effectiveness. A holistic PESTEL view is more appropriate. *Efficacy* is closely related to sustainability and long term effects of services. Long-term efficiency and effectiveness of water and sanitation service production will be low, if sustainability of systems is not ensured and effective service coverage remains fictitious. *Equity* and *equality* criteria focus on distributive justice or the distributional consequences of decisions and action (Adger et al, 2003). These are important criteria in the case of water and sanitation services in developing countries, where focus on mainly economic efficiency objectives easily leads to negligence of the service needs of the poor and marginalised groups.

Legitimacy relates to procedural *justice* and the extent to which decisions and actions are acceptable to stakeholders and their ability to participate in decision making (Adger et al, 2003). Legitimacy is closely related to informal institutions, especially social rules, beliefs, attitudes, and behaviour norms shaping the stakeholders' action. *Accountability* and transparency are essential criteria for viable operation of water services and should be applied to both service producer and customers. *Ethical norms* have become increasingly important when economic efficiency has been emphasised as the key component of performance and the obvious risks of moral hazards have increased.

To conclude, the criteria for defining and measuring the performance of water and sanitation services should be looked at in a more holistic and integrated manner than earlier. The specific features of water and sanitation services require that actually these mentioned *normative criteria* – mainly economic – should be complemented by other *positive* or *descriptive criteria* of performance. Many of these criteria are descriptive in the sense that their objective measurement is yet difficult. These descriptive criteria applied to water and sanitation services would comply well with the characteristics of good governance: participatory, consensus-oriented, accountable, transparent, responsive, effective and efficient, equitable, ethical and inclusive and legitimately following the rule of law (Figure 2.3).

The performance of water service organisations – including efficiency, effectiveness and other normative criteria – can be assessed by generally agreed and accepted criteria such as the *performance indicators*. A performance indicator is a quantitative measure of a particular aspect of the utility's performance or standard of service. It assists in the monitoring and evaluation of the efficiency and effectiveness of the undertaking, thus simplifying an otherwise complex evaluation (Alegre et al, 2000; Chapter 4; Article V). Although the expert argumentation generally confirmed that the current performance indicators are perceived as satisfactory (Chapter 4.2.4), there may be increasing need to consider a more holistic and qualitative approach to performance measurement in water and sanitation services. Qualitative and descriptive criteria will become more important and, therefore, appropriate indicators need to be developed to adequately incorporate these aspects into the measurement of organisational performance.

Although institutional economics emphasises the role of institutions, it recognises the essential role of organisations as actors through which institutions come into existence and have an impact on the economic and social performance of society. According to Lawrence (1999, p. 167), *institutional strategies* are “patterns of organisational action that are directed toward managing institutional structures, and *institutional structures* are patterns of organisational action concerned with the formation, and transformation and change, of institutions. Thus, it is necessary to take a closer look at organisation theories to better understand the role of organisations in water and sanitation services management.

3.4.4 Contributions of organisation theories

Organisations are essential in water management, because the various actors and stakeholders involved in water services management perform their roles in the form of organisations. However, organisations especially in developing countries often behave and perform in a complex and unpredictable manner. An understanding of organisation theories helps establish a systemic approach to water services sector organisations and to look for appropriate approaches and practices to manage and lead these organisations (Chapter 3.5). Organisation theories are here discussed under institutional theories, although a clear distinction is made in this dissertation between organisations and institutions (Chapter 3.4.2).

Rawlinson (2002) has done a comprehensive literature review of the theories and methods of organisational studies and management research, and some of the findings in this dissertation are based on his contribution. Tyson and Jackson (1992) have also widely described the evolution of organisational theories. **Organisational development (OD)** is a planned effort to increase an organisation's effectiveness and performance through planned interventions using behavioural science knowledge (Tyson and Jackson, 1992). OD aims at improving an organisation's ability to cope with changes and its problem-solving and renewal processes through effective management and organisational culture. Re-engineering is one process of OD, which aims at redesigning the organisation's processes but not the organisational structure.

Mintzberg (1983, 1989) assumed that every organisation has five main parts contained within a prevailing ideology: (1) the technical operating core, (2) middle management, (3) top management or strategic apex, (4) technical support, and (5) administrative support. Mintzberg, Ahlstrand and Lampel (1998, pp. 307-309) categorise seven basic types of organisational structures: (1) entrepreneurial, (2) machine, (3) professional, (4) diversified, (5) adhocracy or innovative, (6) missionary, and (7) political organisation. These organisational structures are closely connected to strategic management in organisations. Mintzberg et al (1998) also link human resource development closely to organisational strategy in describing their proposed ten various schools of strategic management: (1) design, (2) planning, (3) position, (4) entrepreneurial, (5) cognitive, (6) cultural, (7) learning, (8) environmental, (9) power, and (10) configurative.

Contingency theory of organisations (CTO) is a collection of several theories of the humanistic management variation (Morgan, 1997, p. 44) based on the open systems view of organisations, which need careful management to adapt to changing environments. According to CTO, there are two ideal types of organisations: (1) mechanistic and (2) organic (Donaldson, 2001; Tyson and Jackson, 1992, p. 144). Traditionally, water sector organisations in many developing countries used to be fairly **mechanistic (MO)**, with many of the following characteristics (as stated by Tyson and Jackson, 1992):

- abstract tasks
- specialised differentiation of tasks
- immediate superiors coordinate work
- precise and formal job descriptions
- hierarchical organisation structure
- information and decisions flow downwards
- vertical interaction
- strict rules of work (conduct)
- loyalty is essential
- emphasis on local knowledge.

Organic organisations (OO) adapt better to their environment than mechanistic ones. Future organisations need to be more organic. Mechanistic organisations are often bureaucratic, as, for instance, the water sector organisations in Kenya. Future organic organisations will be able to adapt and change quickly to meet changes in the environment or the market. They can be described as innovative or “adhocratic” instead of bureaucratic (Tyson and Jackson, 1992, p. 169).

Learning organisations (LO) make critical information available throughout the organisation. Consequently, increased learning and capacity of individuals and the organisation enable the organisation to better respond to challenges in the new operational environment (Morgan, 1997; Senge, 1990). **Knowledge organisations (KO)** use appropriate knowledge management tools to create new knowledge and innovations, and to effectively transform the tacit knowledge of individuals to explicit and tangible knowledge applicable by the organisation for its improved performance (Davenport and Prusak, 1998; Nonaka and Takeuchi, 1995; Tuomi, 1999; Chapter 3.5.3). The importance of knowledge management in water service organisations is elaborated in Chapter 3.5.3 and in Article V.

Organisational behaviour (OB) is the systematic study of the actions, attitudes and behaviour of individuals and groups in organisations, and the interactions between organisations and their environments (Dunford, 1992; Robbins, 2003; Tyson and Jackson, 1992). OB theories have evolved more toward contingency-based streams, and recently systems theories, chaos theories, complexity theories, and artificial intelligence theories have produced further theories of **organisational dynamics**. Organisational behaviour is not the sum of the behaviour of all individuals within an organisation, since “individuals act, organisations behave.” Yet, an organisation’s behaviour or actions are a manifestation of several individuals’ actions.

Organisational psychology (OP) studies the behaviour and attitude of people in work situations in organisations and is closely related to organisational behaviour. OP theories explore why organisations perform or do not perform their tasks. OP tries to understand individuals’ work attitudes and behaviour in organisations, focusing on the processes of staff selection, performance evaluation, training, motivation, work attitudes, job satisfaction, occupational stress and burnout, leadership, organisational culture, organisation development, and human factors at the individual, group and organisational levels. Motivational problems are among the most pertinent constraints leading to inefficiency in public sector organisations in developing countries. Lack of clear objectives and goals may result from inadequate visionary leadership at the organisational level, but organisational psychology attempts to explain the motivational constraints at the individual level (Hofstede, 1997; Robbins, 2003; Yukl, 2002).

According to the **systems theory of organisations (STO)** organisations have “the qualities of biological organisms”. Systems theory does not explain organisational behaviour as such but it does provide a framework for studying the interrelationships of organisational behaviour. STO defines interdependences between input, throughput and output, including feedback loops, and linkages between systems and sub-systems (Tyson and Jackson, 1992). The systems approach erases many “laws” or principles of management and focuses on the relationships between organisational variables (Stuart-Kotze, 2002). The author’s perception is that hard systems thinking and modelling does not work very well with organisations, because organisations are essentially human activity systems that can be more successfully analysed using soft systems approaches.

Anderson (1999) has discussed the application of **complexity theory** in organisation science. “Applying complex adaptive systems models to strategic management leads to an emphasis on building systems that can rapidly evolve effective adaptive solutions” (Anderson, 1999). Complex adaptive system models use four key elements to simplify the complexity: (1) agents with schemata, (2) self-organising networks sustained by importing energy, (3) co-evolution to the edge of chaos, and (4) system evolution based on recombination.

Organisational memory (OM) theories explain to a large extent the inefficiency of water sector organisations and the inconsistency and discontinuity in their decision making. OM can be described as “stored information from an organisation’s history that can be used in present decisions” (Choo, 1998; Prusak, 1997). As pointed out in Chapter 3.5.3 and in Article V, utilisation of the tacit knowledge in an organisation and understanding of the path dependence of decision making are crucial in turning organisational memory into a valuable resource of an organisation (Prusak, 1997).

Stakeholder theories (ST) analyse the connection structures between organisations. Stakeholder theories have three main streams: (1) descriptive or empirical, (2) instrumental, and (3) normative (Donaldson and Preston, 1995). A stakeholder in an organisation is any group or individual who can affect or is affected by the achievement of the organisation’s objectives (Freeman, 1984, p. 46; Friedman and Miles, 2002; Näsi and Näsi, 2002). Stakeholders can be primary or secondary (or tertiary) and internal or external. Stakeholders can also be categorised according to their (i) power, (ii) legitimacy, and (iii) urgency status in relation to the organisation (Mitchell, Agle and Wood, 1997). Stakeholder theories recognise the increased change toward a network economy, which is based on a holistic, systemic, cognitive and dynamic approach. The international water industry has increasingly become a complex network economy, where it is actually difficult to clearly recognise all the stakeholders and their power, legitimacy and urgency relations. In developing countries the roles and responsibilities of various stakeholders have not earlier been adequately recognised. For instance, the roles of customers and many indirect stakeholder groups have not been seriously considered (Article IV).

Typical problems in water service organisations in developing countries include: authoritative management systems, bureaucracy, corruption, and weak performance incentives. The reasons for poor individual performance include poor incentives, poor understanding of goals, lack of vision, and logistic reasons. Performance can be improved through better education, increased skills, better incentives, visionary thinking and knowledge management. An understanding of organisation theories and the root causes for inferior organisational performance is essential for improving management.

Water service organisations need to have and apply a clear strategy in performing their operations. **Strategic organisations (SO)** make the strategy process an elementary function of their organisation. Strategy consists of strategic intent (the organisation’s vision), strategy content, and the strategy process. The strategic management of an organisation should be based on a lenient plan which defines the mission and business idea and provides the required resources. Operational management provides the practical tools and measures to achieve the overall organisational goals and objectives.

Water utilities and other water service organisations need appropriate management and leadership approaches and practices in order to perform in accordance with their defined goals and objectives. Effective management and leadership combined with an appropriate and functioning institutional framework are the prerequisites for viable and successful long-term performance.

3.5 Management and leadership aspects

3.5.1 Purposes and various streams of management and leadership

This chapter builds on and complements the discussion in Article V regarding theoretical foundations of management and leadership theories and approaches, with a view to better understanding the problems, challenges and required improvements in the water service organisations especially in developing countries. The findings of this literature review have also been used to analyse current problems, improvement needs and development paths of water services management, especially as they apply to Kenya (Chapter 5).

Water utilities and other organisations have two different roles and tasks – management and leadership, which should not be confused. The basic processes and functions of management include (1) planning, (2) organising, (3) directing, and (4) controlling (Grigg, 1986; Hersey, Blanchard and Johnson, 1996, p. 10). Leadership is “the process of influencing others to understand and agree about what needs to be done, and how it can be done effectively, as well as facilitating individual and collective efforts to accomplish shared objectives” (Yukl, 2002, p. 7). Thus, management deals more with activities and processes while leadership deals with leading people and organisations and getting things done through people (Article V). Management is related to implementation and aims at doing things right, while leadership primarily aims at doing the right things (Table 3.1). According to McCrimmon (2003), “leadership is about advocating a change in direction, while management is about executing existing directions as efficiently as possible”. Leadership means affecting employees in such a way that they voluntarily follow the organisation’s set goals. Table 3.1 shows some conceptual differences between management and leadership.

Table 3.1 Key conceptual differences between management and leadership (Sources: Bennis and Nanus, 1985; Covey, 1989; Forsberg, 2003).

Management	Leadership
“Doing things right”	“Doing the right things”
Policy and implementation	Vision and direction
Procedures	Shared values
Processes and systems	People (changing behaviour)
Efficiency	Effectiveness
“Hard thinking”	“Soft thinking”
Bottom line	Top line

Most water service organisations in developing – as well as in developed countries – are not adequately well managed, and definitely not adequately led. Water utilities and policy level water organisations in developing countries – for instance water ministries – may actually often be over-managed but often under-led. The technical operations of a water utility require a high degree of organisation and management skills. Managing human resources (people) requires skills beyond normal management skills – it requires leadership. Leadership and management skills should include (i) technical, (ii) interpersonal, and (iii) conceptual skills (Yukl, 2002, p. 176).

In developing countries water utility managers definitely need better management skills to improve the performance of inefficient and poorly operated water utilities. Too often their management practices follow “management by crisis” theories or other *laissez-faire* procedures. As pointed out in Article III, especially financial management practices are usually inappropriate. Introduction of improved management approaches to utilities will help the situation, but is not enough in itself. Many organisations actually need less management and more leadership.

Water service organisations – both in developing and developed countries – have been fairly conventional and conservative in their management and leadership approaches, as Article V and Chapter 4.2.5 prove. Conventional management and leadership theories used to be built on the *managerial* or *leadership grid* concept first introduced by Blake and Mouton (Hersey et al, 1996). It was based on conservative managerial behaviour. The “9,9-style” was considered best in all situations. As concluded in Article V, the new thinking recognises several other profiles for successful managers and leaders.

According to Rawlinson (2002), the major epistemological positions in management research are: positivism, conventionalism, postmodernism, critical theory, and critical realism. Many leadership researchers refer to Burns (1978), who introduced the theories of transforming and transactional leadership. Burns (1978) had an interdisciplinary approach to leadership, and his leadership framework developed from psychology, psychoanalysis, history, political science, biography, and sociology. Later it has been found that many other disciplines have also much contributed to modern leadership theories. Organisational psychology is one of them. Hunt (1991) has showed the path to new leadership approaches. Hunt (1991) also widened the scope of disciplines that have contributed to leadership theories to include philosophy of science, systems theory, simulation, and dynamic analysis.

Evolution of various dominant management approaches and styles in private business enterprises and the perceived subsequent trends in the public sector, have been described in Article V and by Näsi and Aunola (2002). The various schools of strategic thinking and management described by Mintzberg et al (1998) in Chapter 3.4.4 are to some extent applicable to water utilities and other public sector organisations. There are several other approaches and schools of management and leadership that have evolved over the last 50 years. Some of these streams have been adopted by water services organisations, but usually somewhat later than by the private sector.

In addition to the commonly used **management by objectives (MBO)** and **management by results (MBR)**, the concepts of **management by values (MBV)** and **management by navigation (MBN)** have emerged in private business enterprises since late 1990s (Dolan and Garcia, 1999; Kauppinen, 1999, 2002). MBO and MBR also became rather popular in water utilities and are still the dominant streams as described in Chapter 4.2.5. The concept of **change management (CM)** was introduced in the 1980s, but it never gained wide popularity among organisations. On the other hand, Balogun and Jenkins (2003) have viewed strategic change as a process of knowledge creation and transformation of tacit knowledge, and thus link change management to organisational knowledge and **knowledge management (KM)**.

Total quality management (TQM) became popular in the 1990s and common also in public sector organisations. According to the Delphi survey described in Chapter 4.2.5, TQM is the next most common management style in water utilities after MBO and MBR. Many water utilities have applied quality management principles in their operations and adopted systems, such as ISO standards 9001 and 14001.

Popular leadership styles developed since the 1980s include transactional, transformational, situational, visionary, charismatic, dynamic, principle-centred, and intelligent leadership. **Transactional leadership (TAL)** concentrates on the interaction between the manager and the subordinates and is simply mutual exchange of economic and political reasons between leader and follower (Burns, 1978). **Transformational leadership (TFL)** explains how leaders motivate and commit subordinates to well-above-average organisational performance. Subordinates are inspired to transcend their own interests and become committed to achieving the leaders' vision for the organisation. Thus, TFL attempts to operationalise effective leader behaviours (Burns, 1978; Hersey et al, 1996; Tracey and Hinkin, 1998). Hersey et al (1996, p. 521) categorise also visionary, strategic and charismatic leadership under TFL. **Situational leadership (SL)** assumes that leadership situations vary enormously. Thus leadership style should comply with the current situation and effectiveness of a leadership style is *contingent* on the situation (Fiedler and Garcia, 1987; Hersey, 1985; Hersey et al, 1996). However, McCrimmon (2003) considers situational leadership old-fashioned and overly academic.

Charismatic leadership (CL) aims at transforming the employees to achieve the organisation's set goals, independent of their own interests (Burns, 1978; Conger and Kanungo, 1998; House and Shamir, 1993). The concept of **dynamic leadership (DL)** goes beyond the normal visionary leader concept. **Visionary leadership** is discussed in more detail in Chapter 3.5.2. **Principle-centred leadership (PCL)** emphasises the elements of path-finding, aligning and empowering in the leader's role (Covey, 1996; Hesselbein, Goldsmith and Beckhard, 1996). **Intelligent leadership (IL)** is one of the latest fashions, which emphasises the creativity and credibility of the leader (Hooper and Potter, 2000; Johnston, 2001; Sydänmaalakka, 2000, 2003). Emotional intelligence is a prerequisite for enthusiasm, inspiration and commitment (Johnston, 2001). According to Sternberg and Vroom (2002), the three key components of leadership are wisdom, intelligence and creativity – in a synthesised manner – which they combine into the WICS model. In addition to creativity, Ulrich (1996) emphasises, successful leaders should have high personal credibility as well as organisational capability.

As one of the latest fashions, the concept of **deep leadership (DL)** has recently gained popularity at least among military organisations (Nissinen, 2001). Deep leadership is based on questions and a framework of different dimensions that are used in leadership training: (1) professional skills, (2) building confidence, (3) inspiring way of motivating subordinates, (4) intelligent stimulation of innovativeness and creativity, (5) individualistic encounter with people, (6) controlling or transactional leadership, (7) passive leadership, (8) effective leadership, (9) satisfaction, and (10) desire for endeavour.

Leadership concepts and styles are less known to water services organisations than the management concepts. In general, this reflects the rather conventional and technically oriented management traditions of water utilities. Water utilities are still commonly understood as mechanistic organisations, whose main purpose is to technically run water systems in a professional and economic way. Employees are perceived as elementary contributors to this efficient and effective technical and economic performance. However, their role as knowledgeable individuals, who should be closely committed also to the organisation's vision and strategic goals may not yet have been fully conceptualised. Therefore, visionary leadership and management are needed in water service organisations, as elaborated in the next chapter.

3.5.2 Visionary leadership and visionary management

Water utilities and other water service organisations have been rather conventional and conservative in their management and leadership styles, and have mostly concentrated on short-term operational management (maximum perspective of 2 years) and medium-term strategic management (3-5 year perspective) (Article V). Yet, water utilities need visionary development and management due to the following long-term considerations:

- Safeguarding the availability of water resources in the long-term
- Long-term investments (long lifetime of assets)
- Need to consider regional co-operation (e.g. supra-municipal)
- Customer service demands
- Irreversible and path dependent nature of decisions (e.g. long-term concessions, privatisation).

Conventional styles are no longer successful, and, therefore, water utilities should start applying a visionary approach to the management of their long-term development tasks. The new thinking recognises several demanding profiles of visionary managers and leaders. The appropriate requirements for visionary leadership vary especially with respect to the leader's influence over others and change (Manning and Robertson, 2002). These requirements are widely discussed in Article V. **Visionary leadership (VL)** can to some extent be considered one of the many leadership styles in the evolution stream of management and leadership styles and practices (Chapter 3.5.1). **Visionary management (VM)** – on the other hand – should be understood as a necessary function in every organisation to complement operational and strategic management, as emphasised by Malaska and Holstius (1999) and Article V.

Water service organisations need better leadership in order to commit their human resources to perform better towards known and shared goals and the vision. Visionary leadership is especially important for policy-making organisations, but similarly also for operational organisations such as water utilities (Article V). Unclear goals are among the factors contributing most to inefficiency and poor viability of water utilities for instance in Kenya (Hukka, 1998; Chapters 2 and 5).

Visionary leadership is a dynamic and interactive process, which includes at least five different leadership styles: creator, proselytiser, idealist, bricoleur, and diviner (Westley and Mintzberg, 1989, p. 23). Visionary leadership and management are built on the shared vision of the organisation utilise the concepts of strategic management (Article V). The shared strategic vision must take into account both the strategic content and the strategic contexts of product, market, issue, process, and organisation. The strategic content and the strategic context of the vision are both equally important. The strategic content involves two components: (1) the central image is the vision that is surrounded by (2) a halo that assists in accepting the vision. The strategic context includes all factors that influence the visionary process. The vision in itself is not enough, but the process by which the vision is transmitted is also important (Nanus, 1992; Westley and Mintzberg, 1989).

Ethical considerations are becoming increasingly important for visionary leaders (Vivlienghi, 2000) and are of essential importance in the water sector (Davis and McGinn, 2001; Lord Selborne, 2000). The leader's understanding of leadership is severely incomplete – if not deformed – unless he considers also the ethics or morality of leadership. True, effective leadership implies that the leader's behaviour and his leadership processes are consistent with ethical and moral values (Kanungo and Mendonca, 1995; Yukl, 2002, p. 401).

As pointed out in Article V, visionary management does not make operational and strategic management unnecessary – both management time-frames are important for an organisation. According to some schools, strategic management is understood to include also visionary management. In strategic management the situation is uncertain but predictable, at least to some extent. The objectives are focused on medium-term strategic interests and adaptation. In visionary decision making the situation is largely discontinuous, unpredictable and emergent. The purpose of visionary management is focused on long-term survival and finding new options through reframing of business, envisioning and creating new capabilities – skills, knowledge and resources – for the organisation, as explained in Article V.

Visionary management should be integrated into the organisation's strategic decision making and development. Integrated application of scenario processes and other futures research tools in the strategy process (ISSP) can bring practical and proactive results to the organisation, as described in Chapter 3.6.6 and in Figure 3.13. In addition, strategic and visionary management should be adequately linked to the knowledge management functions of the organisation discussed below and more in detail in Chapter 3.5.3 and Article V.

3.5.3 Knowledge management framework

Knowledge management (KM) concepts, principles and applications have been discussed in Article V. Knowledge can be defined as applied information; information used to actively help execute tasks, solve problems and make decisions (Liebowitz and Beckman, 1998). However, knowledge differs from data and information in that it contains both (Davenport and Prusak, 1998, Tuominen, 2002). Keskinen (1999) introduced the “DINK onion”, in which knowledge accumulates from data and information.

According to Bukowitz and Williams (1999, cited by Tuominen, 2002), knowledge assets include (1) knowledge repositories, (2) relationships, (3) information technology and communication infrastructure, (4) functional skill sets, (5) process know-how, (6) environmental responsiveness, (7) organisational intelligence, (8) failure, and (9) external sources. In a wider sense, knowledge is an intellectual capital value, comprising human capital, organisational capital, and customer capital (Bukowitz and Williams, 1999, p. 264; Ståhle and Grönroos, 2000; Article V). The process of knowledge management has been presented by Liebowitz and Beckman (1998) as an eight-stage process: (1) identify, (2) collect, (3) select, (4) store, (5) share, (6) apply, (7) create, and (8) sell. Weggeman's (1997) continuously cycling knowledge value chain has been described in Article V.

Water and sanitation services are typically investment-intensive due to the high asset value and share of physical infrastructure needed to supply the services. On the other hand, they are also knowledge-intensive services. Operating and managing water and sanitation services requires proper utilisation of data and information related to water resources and their long-term availability, processes of water and wastewater treatment, distribution networks, management of the utility's assets, and eventually operational and strategic management of the entire system.

In practice, however, most water utilities do not manage their knowledge and information processes very well – including communication, core competencies, and change management – although these are very central to their performance and success. Utilities often lack clear direction and purpose in their strategic information acquisition and suffer from inefficient management of quantitative information. As emphasised in Article V,

knowledge management is needed to improve utility performance through better management of critical information and knowledge resources. Knowledge management offers a long-term approach in water utility management. It allows utilities to leverage their most valuable assets, collective know-how, talent and expertise. Only by focusing on these resources can water utilities be innovative and handle new threats and opportunities.

Water utilities typically have a lot of **tacit knowledge** accumulated in experienced utility employees. As mentioned in Article V, the share of explicit knowledge is usually at most five per cent compared to the 95 per cent which exists in other forms – mainly tacit knowledge. The big challenge is how this valuable tacit knowledge can be adequately utilised, because it is difficult to transfer and utilise in an organisation (Article V). Tacit knowledge is also related to organisational memory (Chapter 3.4.4; Article V), which is at risk in many water utilities due to ageing and retirement of employees or staff migrating to other more tempting jobs and sectors.

Thus, knowledge management should be seen as a necessary and practical function in every organisation and not just a fashion or management style. KM should be an integral element of an organisation's management system – a platform through which the data, information and knowledge collected and accumulated in various operations and at various levels can be utilised in the organisation's operational, strategic and visionary decision making and management.

According to Tuomi (1999, p. 33), the main disciplines of knowledge management include (1) organisational intelligence, (2) organisational development, and (3) organisational information processing. KM means formalisation of and access to experience, knowledge and expertise. For a water utility, KM enables new capabilities, superior performance, encourages innovation and adds value to customer services. The essential dimensions of the knowledge management framework are described in Figure 3.11 and a more detailed interpretation is provided in Table 3.2.

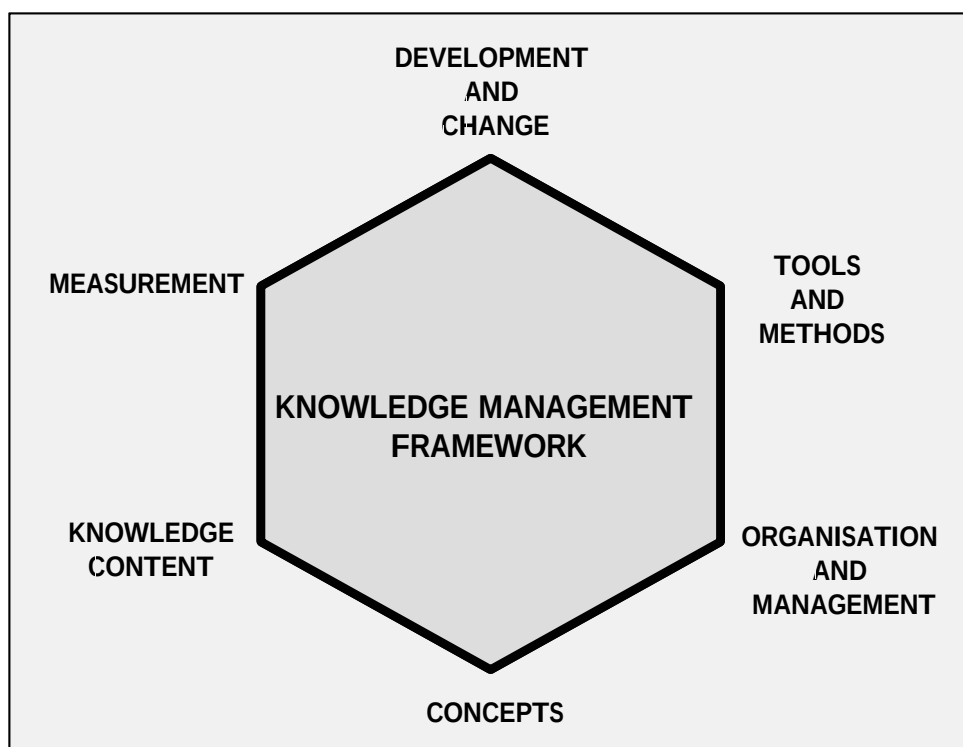


Figure 3.11 Knowledge management framework (modified from Tuomi, 1999).

Table 3.2 *Interpretation of knowledge management dimensions (modified from Tuomi, 1999).*

Framework dimension	Interpretation
Concepts	An integrated set of constructs for understanding knowledge and its management in organisations
Development and change	Migration and co-existence of knowledge frameworks, processes, tools, and behaviour
Organisation and management	Integration and institutionalisation of formal, informal and knowledge processing structures; knowledge management roles; organisational institutions, including incentive structures, knowledge sharing policies, and culture
Content	Characteristics and typologies of the products of knowledge processes
Measurement	Valuation of knowledge content, capabilities, and potential opportunities for their utilisation; measuring knowledge processes, and locating areas of improvement
Tools and methods	Methodologies, organisationally tailored “communication packages”, information systems

Various technological and socio-cultural tools can be used in KM. Technological tools, such as information technology (IT) are increasingly used, but social tools are also important – especially in processing tacit knowledge. Article V discusses the current applications used by the water service organisations of selected countries. Knowledge management tools are mainly used in technical operations or strategic management. The most commonly used explicit KM tools in water utilities are the Internet and different databases, which in most cases are used for operations and maintenance or monitoring purposes. Implicit KM tools of water utilities mainly consist of various group meetings and task forces, where information about utility operations or strategic issues is discussed (Chapter 4.2.5).

Although water utilities and other water and sanitation organisations have not been very progressive and innovative in adopting and applying knowledge management tools and practices, in the future they will have to revise their approaches and adjust to the trends of the information society. The nature and characteristics of water and sanitation as the key environmental services and economic infrastructure provide excellent opportunities for applying the principles of the future eco-knowledge society – eKnowledge – emphasising its holistic and integrated dimensions: (i) “electronic” dimension related to information and communication technologies, (ii) ecological approach and environmental sustainability, (iii) economic sustainability, (iv) ethical and lifestyle views, (v) evaluation aspects, (vi) foresight approach based on futures research, and (vii) evolutionary aspects of information society (Heinonen, 2001). Thus, futures research approach strongly supports the knowledge management function of an organisation.

3.6 Futures research approach and methodology

3.6.1 Ontology and epistemology of futures research

The ontology and epistemology of futures research form the methodological foundation of this dissertation, although contributions from other disciplines are also utilised as explained in Chapter 3.1. The purpose of futures research is to discover or invent, examine and evaluate as well as propose images of possible, plausible and preferable futures in order to facilitate decision making on the alternatives and the desirable future (Bell, 1997, p. 73). The future is neither (1) predictable nor (2) predetermined, and (3) we can affect our future with our actions and selections. Futures research studies what is possible, probable, desirable and non-desirable. Futures research aims at offering justified views on the future and its development alternatives to facilitate planning, decision making and action. Decision-makers should know the implications of alternative choices and development paths. Futures research can *proactively* assist decision-makers by looking at the past and present from the viewpoint of future's needs and alternatives.

The ontology and epistemology of futures research have been discussed for instance by Bell (1997), Mannermaa (1991, 2003b), Masini (2001, 2002), and Futurix (2003). Godet (2001) has mentioned five basic criteria which good futures research should fulfil: (1) scientifically relevant, (2) consistent and coherent, (3) scientifically convincing, (4) scientifically transparent, and (5) concentrating on the essential questions. Bell (1997, pp. 75-97) has presented the following nine basic tasks of futures research: (1) the study of possible futures, (2) the study of probable futures, (3) the study of images of the future, (4) the study of the knowledge foundations of futures studies, (5) the study of ethical foundations of futures studies, (6) interpreting the past and orientating the present, (7) integrating knowledge and values for designing social action, (8) increasing democratic participation in imaging and designing the future, and (9) communicating and advocating a particular image of the future.

In this research, the key strategic purpose of futures research methodologies and visionary approaches were to serve as a tool in decision making by elaborating the available alternative futures and development paths. Futures thinking, strategy and operational decision making must interact while remaining distinct. This way, the strategic organisation can succeed in acting not only on the current "front" but also on the uncertain futures which yield both threats and opportunities (Godet, 2001, p. 131). Our perspective and attitude towards future can be: passive, reactive, preactive, proactive, and anticipative (Godet, 2001, p. 7; Bell, 1997).

The epistemology of futures research is connected to the methodology used to obtain information about alternative futures. Futures research can be categorised into (1) *descriptive* and predictive, (2) *scenario-based*, and (3) *evolutionary* approaches. Descriptive methodologies aim at outlining predictions that extrapolate the past development path. The scenario approach aims at outlining several alternative development paths. Scenarios assist decision making by reducing uncertainty through increasing information about the future. Evolutionary futures research is based on complexity thinking and social application of evolution theories (Mannermaa, 1991).

In this research, both the scenario-based and evolutionary approaches were used. In its traditional form the Delphi technique is mainly a descriptive method, while the modern Delphi techniques – used in this research – are commonly used as a part of the scenario process. The soft systems methodology (SSM) is typically of evolutionary nature.

Table 3.3 summarises some of the most commonly used futures research methodologies and describes their features (quantitative or qualitative; normative or exploratory). The methods utilised in this dissertation are in bold and shaded.

Table 3.3 Taxonomy of futures research methodology (combined from Glenn and Gordon, 2003a; 1999; Riner, 1987; Vapaavuori and von Bruun, 2003).

METHOD	Quantitative / Qualitative		Normative / Exploratory	
	Quant.	Qual.	Norm.	Expl.
Agent modelling	●			●
Complexity based models	●			●
Cross impact analysis	●			●
Decision models	●			●
Delphi technique		●	●	●
Econometrics	●			●
Emerging issues analysis		●		●
Environmental scanning		●		●
Field anomaly relaxation (FAR)		●	●	
Futures wheel		●	●	●
Genius forecasting		●	●	●
Issues management		●		
Morphological analysis		●	●	
Normative forecasting	●		●	
Participatory methods		●	●	
Regression	●			●
Relevance trees	●		●	
Scenario techniques	●	●	●	●
Science road maps		●		●
Simulation techniques	●			
Soft systems methodology		●	●	
Statistical modelling	●			●
Structural analysis	●			●
System dynamics	●			●
Tech sequence analysis		●	●	●
Technology foresight	●	●	●	●
Technology road maps		●		●
Time series forecasts	●			●
Trend impact analysis	●			●

3.6.2 Delphi technique

The Delphi technique is one of the most commonly used expert survey and group problem solving methods in futures research. The Delphi technique is especially suitable in cases where the use of quantitative methods involves too many uncertainties. The Delphi technique can be used to predict future events, map expert views, generate quick consensus within a group and quantify human judgement in a group setting. Thus, the Delphi technique is often used as a part of the scenario process. The Delphi is a method for structuring a group communication process so that the process is effective in allowing a group of individuals, as a whole, to deal with a complex problem (Linstone and Turoff, 1975, 2002). An important feature of the Delphi is the ability of the members of a group to participate in an asynchronous manner, in terms of time and aspect. According to Mannermaa (1991), Delphi technique is very relevant in exposing priorities of personal values and social goals, and in explicating the pros and cons of potential policy options.

Group communication processes – such as the Delphi – developed to deal with complex problems usually include at least the following stages (Arditi, 2003b; Fowles, 1978; Kuusi, 1999, 2002, 2003a; Linstone and Turoff, 1975):

1. Exploration of the subject under discussion.
2. Process of reaching an understanding on how the group views the issue.
3. Bringing out the reasons for possible differences discovered, and evaluating them.
4. Final evaluation and conclusions based on previous stages.

The Delphi technique has three main characteristics (Kuusi, 1999, 2002, 2003a; Linstone and Turoff, 1975, 2002; Woudenberg, 1991):

1. *Anonymity*. Ensures honest and genuine expert views. Experts are approached by mail or computer.
2. *Iteration*. There are several rounds of surveys. The results of each survey round are clustered and sent back to participants
3. *Feedback*. Consequent, especially deviating arguments and results are fed back to participants.

The Delphi technique was first used in futures research by the Rand Corporation in the USA in the 1950s. Early Delphi surveys aimed at achieving an eventual consensus among participants, which is no longer the case (Kuusi, 1999, 2003a). Nowadays, the diversity of expert argumentation has been recognised as more important than consensus. Kuusi (1999, 2003a,b) uses for this the term “argument Delphi”. The argument Delphi process usually consists of four main stages: (i) the confrontation stage – selecting issues and topics, (ii) the opening stage, (iii) the argumentation stage, and (iv) the concluding stage (Kuusi, 1999). There are nowadays several modified applications of the Delphi technique: (1) the conventional Delphi, (2) the policy Delphi, and (3) the decision Delphi (Woudenberg, 1991). The argument Delphi is based on the approaches of the policy Delphi (Kuusi, 2003a,b).

Despite its many benefits, the Delphi technique has also been criticised. Especially Sackman (1975) criticised the conventional Delphi (Kuusi, 1999; Linstone and Turoff, 2002). Sackman’s critique focused mainly on the unreliability and scientific validity of the methods. Kuusi (1999, pp. 77-85) has thoroughly discussed Sackman’s critique. It is obvious that the main idea of the modern Delphi technique is to find relevant arguments concerning future developments. However, the Delphi process requires, in all its forms, professional and extensive moderation and facilitation. Arditi (2003b), Linstone (2002) and Mannermaa (1991) have summarised the common pitfalls in the use of Delphi techniques: (1) “discounting” the future, (2) the prediction urge, (3) the simplification urge, (4) illusory

or narrow expertise of panellists, (5) sloppy execution (effect of survey forms), (6) optimism – pessimism bias (accuracy of forecasts), (7) overselling, and (8) deception.

Delphi techniques can be applied in two different main formats: (1) the conventional “paper-and-pencil” version (“Delphi exercise”), and (2) the computerised version (“Delphi conference”) (Linstone and Turoff, 2002). Computer based Delphi techniques were developed in the mid-1970s (Turoff and Hiltz, 2002).

The computerised Delphi format used in this research (initially Professional Delphi Scan, PDS, and later Delfix) is an Internet-based program system. It has been developed by Internetix and Finland Futures Research Centre in the 1990s and substantially redesigned in 2002 (Kuusi, Kaivo-oja and Linturi, 1998; Internetix, 2003). Delfix actually includes two Internet-based program components, Survix and Debatix. This further increases the feasibility of Delfix in argumentation type of Delphi surveys and panels (Chapter 4).

3.6.3 Scenario techniques

A scenario is essentially a manuscript of the future. Since the future is uncertain, several alternative manuscripts of it are required (Kamensky, 2000). Scenarios describe alternative images instead of extrapolating current trends. Box 3.5 summarises some of the most common definitions of the scenario concept.

The scenario technique is a synthetic process, which step by step outlines a chain of probable (and plausible) events that lead to a certain future situation. It also describes this future situation. The process is based on synchronic and diachronic analyses. The former simulate the state of the system at a given time and are driven by the necessity of logical description. The latter concentrate on the progress of events and emphasise the causality and interaction between events (Hynynen et al, 1979; Kaivo-oja, 1999).

Box 3.5 *Selected definitions and features of scenarios (Sources: Fahey and Randall, 1998b; Godet, 1987, 2001; van der Heijden, 1996; Kaivo-oja, 1999; Kamensky, 2000; Mannermaa, 1999; Vapaavuori and von Bruun, 2003).*

SCENARIOS

- Are manuscripts of alternative development paths to futures (*Kaivo-oja, 1999; Kamensky, 2000; Mannermaa, 1999*).
- Are logically progressing chain of events that describe how a possible future situation (probable, desirable, or avoidable) develops step by step from the present situation (*Kaivo-oja, 1999; Mannermaa, 1999; Vapaavuori and von Bruun, 2003*).
- Are a set of reasonably plausible but structurally different futures (*van der Heijden, 1996*).
- Are descriptive narratives of plausible projections of a specific part of the future (*Fahey and Randall, 1998b*).
- Are an entity consisting of description of (1) alternative future situations and (2) events facilitating transition from the present situation to the future situation (*Godet, 1987, 2001; Kaivo-oja, 1999; Mannermaa, 1999*).

Scenarios can be constructed by several methods (Chermack, Lynham and Ruona, 2001; Fahey and Randall, 1998b; Glenn and Gordon, 2002; Mack, 2001; Mannermaa, 1999; Martelli, 2001; van Notten et al, 2003; Ringland, 1999; Rubin, 2003b). A common method is to build scenarios based on futures images and futures matrices. Morphological analyses can also be used (Godet, 2001, p. 104). General environmental or social scenarios can be used as a basis for constructing more detailed sectoral scenarios (Mannermaa, 1999; Glenn and Gordon, 2002). The common feature of all these approaches is that they depend on the theoretical foundations of several disciplines to arrive at a future oriented knowledge base. Indeed, a good scenario building process should be interactive, intense, and imaginative. The process should be rational, based on an epistemic, practical and evaluative approach, and should have a visionary viewpoint.

A comprehensive process for constructing scenarios and using them in a strategy process may consist of the five key stages described in Figure 3.12 (Mannermaa, 1999; Rubin, 2003b; Article V; Chapter 5).

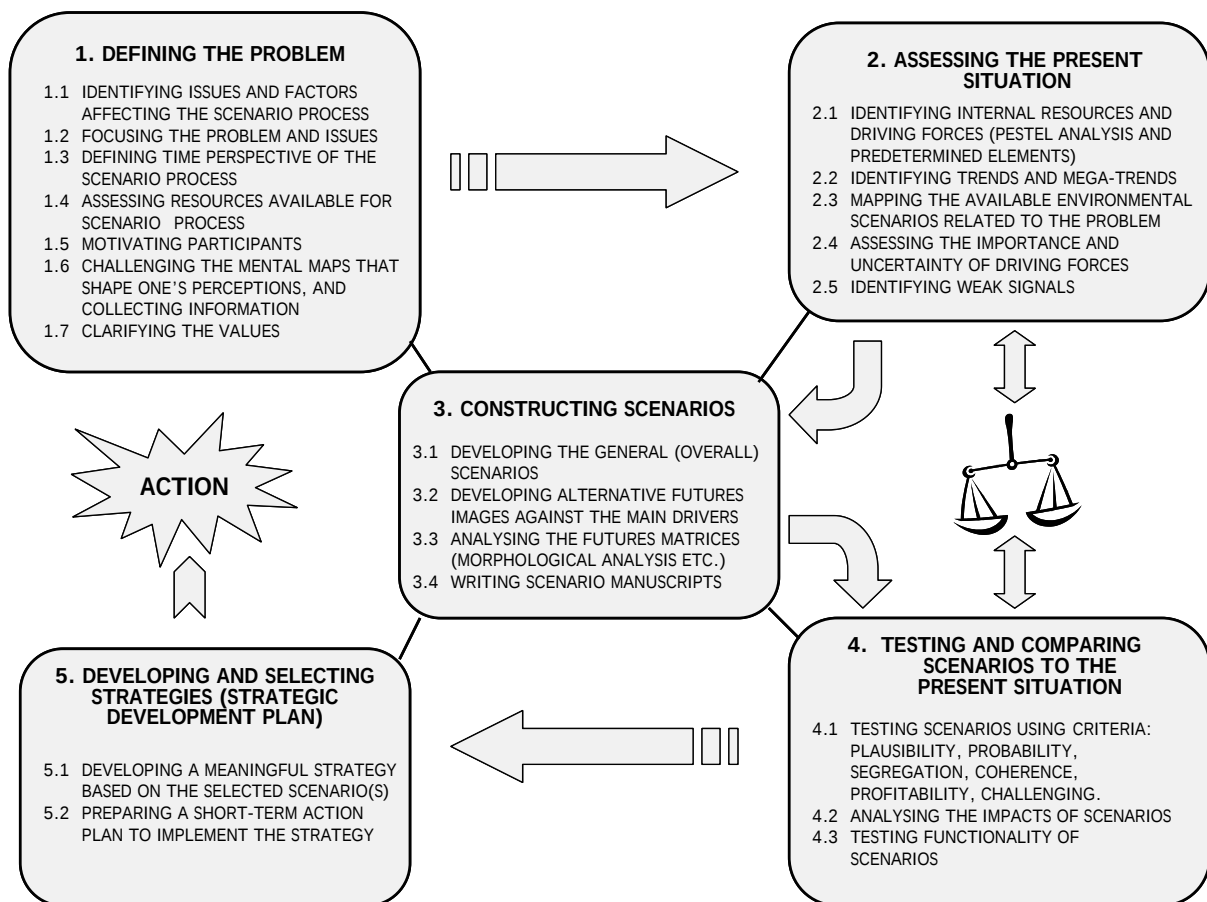
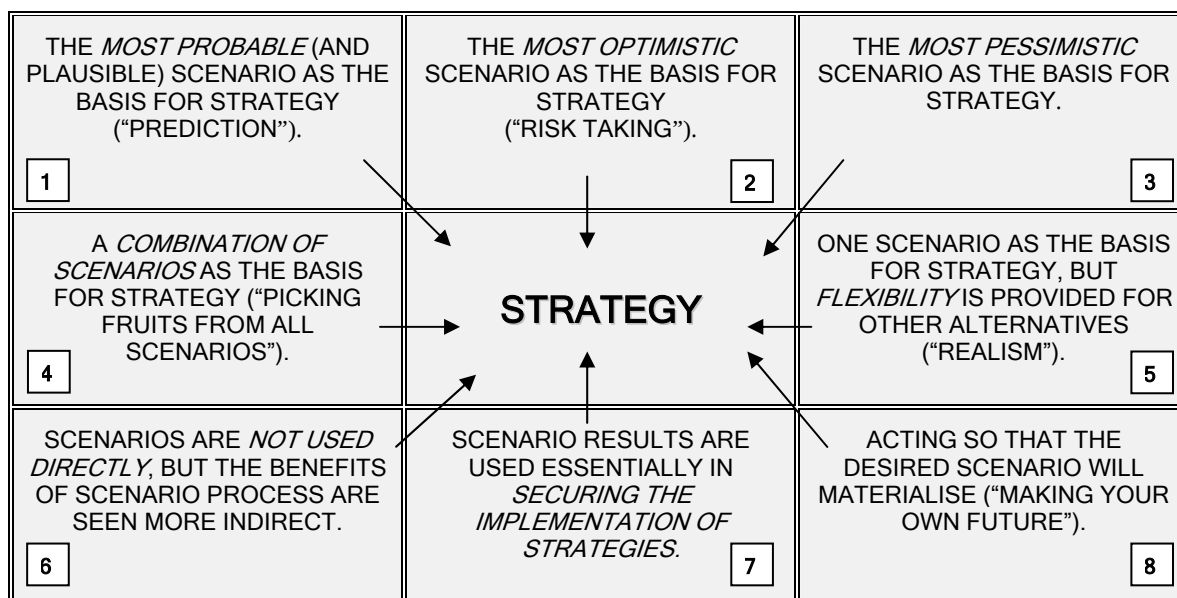


Figure 3.12 Stages of a comprehensive scenario process (modified from Mannermaa, 1999; Rubin, 2003b).

Scenarios are not predictions of a future situation. They can be used more effectively in decision making and strategic management (Godet, 1990, 2001; Godet and Roubelat, 1996; Kaivo-oja, 1999; Kamensky, 2000; Mannermaa, 1999). Table 3.4 shows different possibilities for utilising scenarios in strategic management (Kaivo-oja, 1999; Kamensky, 2000).

Table 3.4 *Different possibilities for utilising scenarios in strategic management (modified from Kaivo-oja, 1999; Kamensky, 2000).*



Good scenarios are possible, probable, plausible, relevant, coherent, desirable, consistent, transparent, innovative, and surprising (Fahey and Randall, 1998b; Godet, 2001, p. 63; Article V). Transparency is vital to the credibility and utility of produced scenarios. Reproducibility is important from the scientific point of view. Scenarios should and can be tested in order to fully utilise them in the strategy process. Some of the analytical testing procedures are discussed in Chapter 3.6.4. Godet (2001), Perrottet (1998), Rubin (2003b) and Wilson (1998) have discussed various methods for testing the validity and feasibility of scenarios. Mannermaa (1999, p. 105) has discussed the impact analysis for scenarios. A basic testing phase for the constructed scenarios can be a usual SWOT analysis. In this research Delphi surveys among experts were used to test the validity of scenarios. The main scenario drivers were selected from among the identified key elements of viability, and their relevance was tested among experts using Delphi surveys.

Godet (2001) has emphasised two main scenario types: (1) normative scenarios and (2) exploratory scenarios. Predictive scenarios can be normative or contrasting scenarios. Exploratory scenarios can be tendency scenarios or framework scenarios (Hynynen et al, 1979; Mannermaa, 1999). Scenarios can be constructed "future backward" or "future forward" (Fahey and Randall, 1998b). The back-casting technique is sometimes used in futures research besides the forecasting technique. Meristö (1991, 2000, 2003) has used the action scenario working process. Intelligent scenario agents and other IT-based scenario platforms have also been developed. Mannermaa (1999, 2003a) has developed a modification of Checkland's soft systems methodology (SSM) for futures research. This visionary scenario process (VIS), and the integrated approach-based on combining scenario techniques with strategic management (ISSP), are described in Chapters 3.6.5 and 3.6.6 and in Article V.

3.6.4 Accompanying analyses for the Delphi and scenario techniques

Cross impact analysis (CIA) is a matrix method of forecasting, or a method of revising estimated probabilities of future events in terms of estimated interactions among them (Dalkey, 2002; Turoff, 2002). A basic limitation of many forecasting methods, as well as the Delphi technique, is that they produce only isolated forecasts, without explicit reference to their possible influence on each other. Yet, most events and trends are in some way interconnected. CIA deals with interdependencies in order to produce more consistent and accurate forecasts (Arditi, 2003a). CIA can also be used in scenarios to analyse how one situation impacts another. CIA addresses Delphi's lack of a mechanism for discovering mutually exclusive or conflicting outcomes. CIA can be used to systematically examine possible future developments and their interactions (Ringland, 1999; Seppälä and Kuusi, 2003).

There are several versions of CIA. Helmer (1977) developed the original *causal* cross impact approach. Later the concept of *correlational* cross impacts and a *sequential* approach to cross impact analysis were developed (Arditi, 2003a). Initially CIA was a sub-routine of the Delphi technique, but later it developed into an independent futures research method. Nowadays trend analysis methods are increasingly used to collect futures-oriented information for CIA instead of Delphi surveys (Seppälä and Kuusi, 2003, p. 146).

The stages of a comprehensive CIA for evaluating future situations are usually the following (Arditi, 2003a; Fowles, 1978; Helmer, 1977):

1. Define the future events and trends ("future variables") to be included in the analysis.
2. Define the planning interval and subintervals, "scenes".
3. Develop cross impact matrices to incorporate several events or trends, and define interdependencies between events and trends.
4. Estimate the impacts of each event or trend on others, and assign rates or scales to impacts.
5. Estimate the initial occurrence probabilities of each event in each scene.
6. Estimate the strength relationships (value) of each trend at the beginning of each scene (in a cross impact matrix).
7. Perform a calibration run.
8. Define the policies, actions, or sensitivity tests to be run with the matrix.
9. Perform the cross impact calculations (e.g. by Monte Carlo simulation or BASICS).
10. Evaluate results.

CIA requires computer calculations to handle the large quantities of cross impact variables. Instead of a stochastic Monte Carlo simulation, for instance a deterministic simulation can be used. An example of deterministic simulation is the BASICS method (Seppälä and Kuusi, 2003). The conventional CIA methods are "mechanistic" and do not apply well at least to the analysis of narrative scenarios. Godet (2001, p. 104) has introduced a systematic and software-assisted structural analysis method for considering issues and consequences of foreseeable conflicts in the alternative scenarios or futures images. The four stages of this *Mactor method* are (Godet, 2001):

- 1) Identify the different dimensions of the problem: issues at stake, potential conflicts, main actors, and their objectives.
- 2) Analyse and describe the strategies identified: (a) direct influences ("actors / actors" matrix) (b) describe and measure the position of each actor in relation to each objective ("actors/ objectives" matrix).
- 3) Feed these two matrices into the Mactor software.
- 4) Interpret results and make them available to actors for analysing.

Futures field analysis is commonly used as a preliminary stage of scenario building. Alternative scenarios can be constructed by combining the various *futures images* presented in the *futures matrix*. A futures matrix can be developed for instance in a *futures workshop* (Seppälä, 2003, pp. 225-228). **Morphological analyses**, such as the *field anomaly relaxation (FAR)* method can be used to systematically screen the futures images regarding the sectors and drivers in order to eliminate incompatible states of the future in the futures matrix (Rhyne, 1995; Seppälä, 1984, 2003). The FAR process can be “automated” using relevant software (Newton, 2000). In fact, the futures matrix method has largely evolved from morphological analyses through the FAR method (Seppälä, 2003, in Vapaavuori and von Bruun, 2003, p. 220). According to Rhyne (1995, p. 659), “FAR offers an ordered, relatively transparent way of projecting alternative, comparably plausible future scenarios”. Rhyne (1995, pp. 659-661) presents a four step cycle which should be repeated at least twice for each FAR exercise.

Trend impact analysis is an effective method for analysing how different phenomena affect the future of the organisation (Glenn and Gordon, 2003a; Mannermaa, 1999, p. 105; Ringland, 1999). Trend impact analysis can also be used as a preliminary stage of the scenario process – for instance as a sub-method when organisation-specific scenarios are developed from general environmental scenarios (as in Chapter 5 for Kenya). The components of trend impact analysis are: (1) speed of the event and its impacts, (2) extent of the impact, (3) system vulnerability regarding the event, and (4) processes supporting vs. resisting survival of the organisation. A cumulative trend impact index can be determined.

3.6.5 Systems thinking and soft systems methodology

Systems are hierarchically organised entities that have defined boundaries and a finite set of interacting sub-entities (sub-systems). Systems exchange information and resources within their environment (inputs/outputs) and carry out activities to transform inputs, thereby achieving their purpose and goals. Systems also use information to monitor and control performance through feedback mechanisms (Stuart-Kotze, 2002). A system is not reality, but rather a means to observe reality (Godet, 2001, p. 14). A system has the following features: (1) it represents a certain wholeness, (2) its nature is hierarchical so that each component can be regarded as a system, and (3) it must be described in a certain manner to obtain information about it. Systems can also be *closed* or *open* to their environment (Checkland, 1981). Checkland (1981) classified systems as (1) *natural systems*, (2) *designed physical systems*, (3) *designed abstract systems*, (4) *human activity systems*, and (5) *transcendental systems*. The concept of human activity system is crucially different from the concepts of natural and designed systems. Human activity systems are sets of human activities more or less consciously ordered in wholes as a result of some underlying purpose or mission (Checkland, 1981; Keskinen, 2002). Checkland (1981, pp. 173-175) also presents a *formal system model*, which helps examining different human activity systems. Any actual *social system* (Checkland, 1981, pp. 119-121) observed in the world will be a mixture of a rational assembly of linked activities (a human activity system) and a set of relationships such as occur in a community (a natural system).

Systems thinking is a systemic way of observing our environment, which enables us better to conceptualise the complex environment we are living in and to understand the relationships between the influencing factors (Godet, 2001, p. 14). Systemic thinking is successful in analysing complex futures questions. It is commonly used as a methodological instrument in the development of scenarios. Systems thinking can be

applied flexibly at any stage of the process (Keskinen, 2002). Checkland (1981) has elaborated the ideas of **soft systems thinking**. According to Checkland (1981) the main difference between “hard” and “soft” systems thinking is that where hard systems thinking asks “what system has to be engineered to solve this problem”, soft systems thinking has to allow completely unexpected answers to emerge at later stages. Soft systems thinking allows for more obscure or fuzzy problems and development goals to be addressed in social systems (Article V). In soft systems thinking the world is seen as complex, being full of problems and even mysterious. When we try to cope with the world, the process of inquiry into it can itself be organised as a learning system. Therefore the word ‘system’ cannot be applied to the world, but to the process whereby we deal with the world (Checkland and Scholes 1999) (Figure 3.13).

Water utilities - and especially policy level authorities - need a more systemic and holistic approach to water services management. Some of the reasons why more systemic approach is required at the water utility level are:

- Complexity of the operational environment
- Soft elements (human activity, customer focus)
- Multi-disciplinarity (arising from the “ontology” of water services).

The systems thinking view can be applied to water services management. The system of water services consists of both the physical water infrastructure and the management system with all its human activity systems. The physical water infrastructure system includes the water supply sub-system, the sewerage sub-system, and the storm-water sub-system. These “hard” infrastructure systems work in interaction with the “soft” human activity systems of water services management as illustrated in Article V.

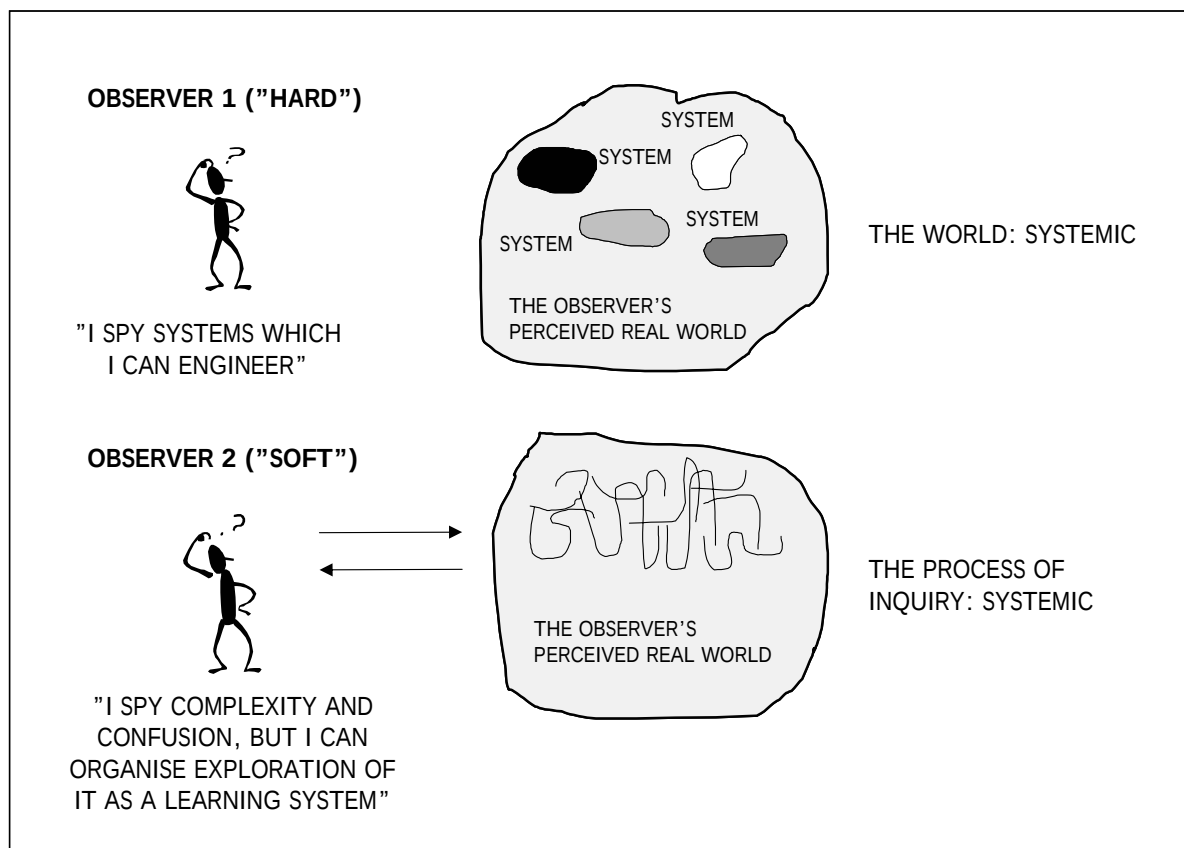


Figure 3.13 Systemic approach in observing the complex reality of “soft human activity systems” (Seppälä and Hukka 2000, modified from Checkland and Scholes 1999).

The soft systems methodology (SSM) is a general and flexible theoretical framework suitable for problem-solving in real-world situations and in human activity systems that are more or less imprecise (Checkland, 1981; Checkland and Scholes, 1999; Hukka, 1998; Mannermaa, 1991, 2003a; Rubin, 2002, 2003a). The purpose of SSM is to enhance understanding of human situations that are perceived as a *problematique* and to suggest needed improvements. If applied properly, SSM is both a problem solving methodology and a learning process in an organisation. The learning is about a complex social situation that entails many (divergent) perspectives on the very issues to be dealt with – including objectives to be achieved (Finegan, 1994). SSM leads to purposeful action aimed at improvement in the situation, action that seems sensible to those concerned. SSM articulates a process of enquiry that leads to the action, this action not being an end point unless participants in the process choose to make it one. Since taking that action changes the problem situation enquiry can continue in a learning process that remains open for new findings.

Mannermaa (1991, 1999, 2003a) modified Checkland's (1981) original SSM methodology to be more applicable to futures research within the framework of the evolutionary paradigm. The application of SSM in futures research is discussed in Article V (Fig. 11). The soft systems methodology (SSM) can be used in the scenario working process as a theoretical framework for the strategic development process (Article V; Chapter 5).

By its nature, SSM is more evolutionary than revolutionary. It causes less stress on the organisation in terms of *change management*, because the actors involved can see the progress of change and understand where and why the change has occurred (Beynon-Davies, 1998; T.A.Robinson, 2002). Utilisation of SSM can develop a good understanding of the factors affecting the organisation and its performance (Finegan, 1994; T.A.Robinson, 2002). SSM's holistic view is useful in the strategic planning of the organisation, not only in systems development (T.A. Robinson, 2002).

However, some researchers consider SSM too soft a methodology. There may be a lot of subjective interpretation during the various stages of SSM, and the process is fairly open ended. The systems requirements definition is a product of negotiation and will not be the most effective (T.A.Robinson, 2002; Shroff, 2000; Shroff, Kahlon and Hantrods, 2000). On the other hand, the European school seems to apply SSM in a more "technical" manner than the American school, which has commonly been criticised of using a "too soft" approach (Godet, 2001).

The knowledge analysis and documentation system (KADS) methodology is an alternative evolutionary SSM process, which concentrates on modelling the organisation or company. In the KADS process seven different models of action and organisation are identified in order to transform the organisation's knowledge-based system (Metodix, 2003; Scriber, 1993; Article V):

1. Organisational model (describes and analyses the system's socio-organisational environment)
2. Application model (defines and prioritises problems)
3. Task model (outlines system functions)
4. Co-operation model (outlines sub-system functions)
5. Expertise model (determines expertise required for problem solving)
6. Conceptual model (for knowledge-based system)
7. Design model (techniques and tools).

The expertise model is the most essential prerequisite for achieving a knowledge-based system. It aims at determining the expertise required for successful problem solving to

enable the system to fulfil its tasks and objectives. The expertise concept is approached from the behavioural point of view (Screiber, 1993).

Beer (1984) has presented the concept of **viable systems** and **viable systems model (VSM)**. VSM is a model of the organisational structure of any viable system. A viable system is organised in such a way that it meets the demands of surviving in a changing environment. Viable systems are recursive. They contain viable sub-systems that can be modelled using an identical cybernetic description as higher and lower level systems in the containment hierarchy (cybernetic isomorphism). A viable system is composed of five interacting functional and recursive subsystems and their relationships (Beer, 1984; Britain, 2002):

- System 1: contains several primary activities (parts of the key transformation).
- System 2: represents the information channels and bodies needed for primary activities.
- System 3: represents the structures and controls to establish rules, resources, rights and responsibilities.
- System 4: looks outward to the environment to monitor how the organisation needs to adapt to remain viable.
- System 5: responsible for policy decisions within the organisation as a whole.

As discussed in Article V, VSM has not been widely applied, since it has some demanding requirements and limitations. Meaningful use of VSM requires an understanding of cybernetics (“cybersystemics”) to conceptualise the basic information, communication, control, and games theories in systemic contexts. VSM is also concerned with control for viability of the whole organisation, and can easily be misunderstood as “totalitarian” (Britain, 2002). Although VSM and SSM have been usually considered as contrasting approaches, they have the potential of being used successfully together. SSM could be used as a methodology to collect ideas and data for constructing a useful VSM. SSM requires a model in the logic-based stream of inquiry, and VSM provides tools and theoretical framework for building a richly elaborated and precise model that can be used for comparison to perceived reality as required by SSM (Britain, 2002).

Soft modelling (SM) has much in common with SSM. Soft modelling addresses a wide range of methods, techniques and tools developed to enhance structured human thinking (Rosenhead, 1989; SGZZ, 2003). Instruments have been created to support the process of making human reasoning explicit. They can be applied in an individual setting or in a social context: a group of individuals uses a model as support for their process of joint analysis, reasoning and decision making. The *sensitivity model* is a structural modelling methodology for handling complex planning problems. It uses the fuzzy logic approach which means integrating qualitative data as well as reducing the number of variables by structuring parameters. *Hexagons for systems thinking* is a methodology for bridging the gap between the generalist thinking of decision makers and the expertise of modellers by concentrating on the conceptualisation stage of modelling. *Strategic options development and analysis (SODA)* is one of the most popular methods for cognitive mapping (SGZZ, 2003). Soft modelling approaches aim at building a picture which is as close as possible to the reality, taking all of its complexities into account. Soft models try to depict reality as it is actually perceived by individuals or a group of individuals. In general, process-related issues are emphasised more strongly compared to content-related questions (SGZZ, 2003).

3.6.6 Integrated approach: scenarios and strategy process

As described in Article V and emphasised by several researchers, scenarios can effectively be used as an integral tool in the strategy and strategic management process (Fahey and Randall, 1998a; Godet, 2001; van der Heijden, 1996, 1997; Ringland, 1999). A scenario-based strategy process incorporates a number of tools and methods, by which the key

actors in an organisation explore alternative futures, develop their own strategies and concrete short-term action plans (Mannermaa, 1999, pp. 57-58). This integrated approach – which in this research is called the **integrated scenario and strategy process (ISSP)** – combines the use of scenarios, core competence trees and strategic analysis and is an essential part of the organisation's strategic architecture (Article V; Godet, 2001; Kamensky, 2000). The objective of this integrated approach is to suggest strategic orientations and actions based on the organisation's core competencies in accordance with scenarios that are applicable both to the organisation and its general operational environment. The concept of **visionary management (VM)** as used in this research is essentially based on the ISSP approach (Chapter 3.5.2).

The visionary scenario process (VIS) is a typical application of the integrated approach (Article V; Mannermaa, 1999). The VIS process aims at providing concrete support for the organisation's strategic and operational decision making. Thus, the visionary management approach essentially complements the functions of operational and strategic management as well as knowledge management in an organisation (Article V).

Figure 3.14 shows how alternative scenarios (S1 – S3) can be utilised as a proactive approach to the organisation's operations and strategy process. This is largely analogous to the “visionary development task” presented in Article V. Scenarios can be used in a flexible manner to find the development paths toward the organisation's vision and goals. “Navigation marks” (checkpoints) are important for adjusting the scenarios and selected strategies along the way as the operational environment changes.

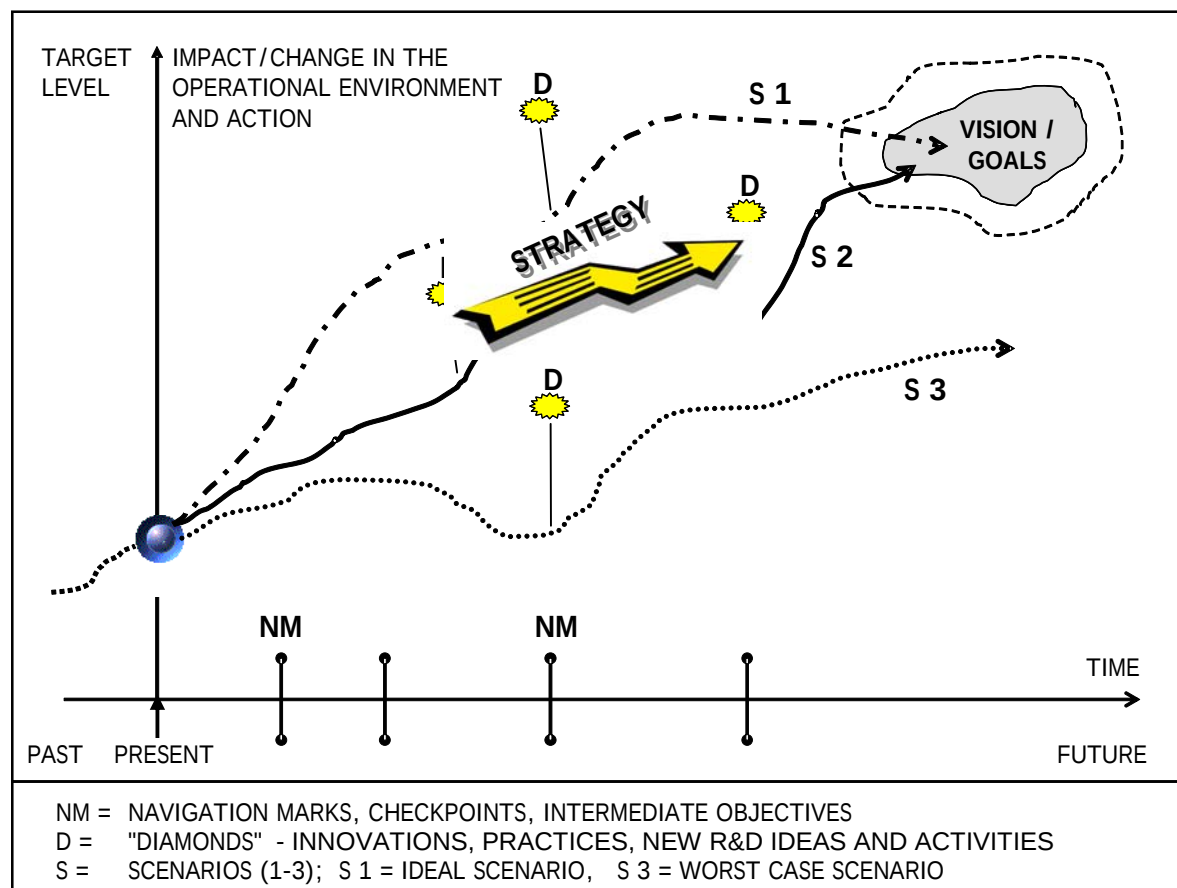


Figure 3.14 Integrated approach in using scenarios as a strategic management tool (modified from Keskinen, 2002; Malaska and Holstius, 1999; Meristö, 2003).

4 EXPERT ARGUMENTATION ON THE KEY RESEARCH ELEMENTS

4.1 Introduction

The identified global problem issues (Chapter 2) and subsequent key research elements (Chapter 2.2 and Original Publications) were analysed using the following materials and methods:

- Review and analysis of sector-specific and theoretical literature
- The author's own experiences and empirical findings
- Interviews and personal communication with colleagues and experts
- Internet-based Delphi surveys and e-mail questionnaires among experts and subsequent argumentation
- Analysis of international e-conference and discussion group outputs.

The Delphi surveys and discussion forums shown in Tables 4.1 and 4.2 formed the basis of the expert argumentation and analysis summarised in Chapter 4.2. The analysis was supported by selected references from literature as deemed relevant.

Delphi surveys

The relevance and importance of the defined key elements were first tested among a group of professionals through limited Delphi surveys (Chapter 2.2). The key elements were slightly modified based on expert feedback. Structuring of Articles I-V is based on the modified key elements. Most of the actual Delphi surveys were carried out in 2003. They were based on the thematic findings and hypotheses of the Articles, electronic conferences, and a literature review. Results and findings from additional Delphi and e-mail surveys were also partly used in the synthesis. The Delphi surveys and e-mail surveys utilised in the analysis of this dissertation are summarised in Table 4.1.

Table 4.1 Series of Delphi surveys carried out for expert argumentation in this study.

No.	Time / Date	Topic / Issue	Participants	Format
1	August 1999	VEVI project. Test Delphi survey on Finnish water sector development assistance. (Katko et al, 2000).	15 Finnish water sector professionals. Participation rate 50 % (15/30).	PDS Delphi survey: 48 questions on 17 key issues.
2	September 1999	VEVI project. Development of Finnish export activities in water services sector. (Katko et al, 2000).	33 Finnish water sector professionals. Participation rate 47 % (33/70).	PDS Delphi survey: 51 questions on six thematic areas.
3	September 1999	VEVI project. Development of Finnish export activities in water services sector. (Katko et al, 2000).	20 Finnish water sector professionals. Participation rate 30 % (20/70).	PDS Delphi on-line debate ("hot-day"): Eight key issues.
4	September 2000	Private sector participation (PSP) and PPP in Finland. Related to MSc thesis of Metsälä (2001).	456 Finnish water sector professionals. Participation rate 16 % (73/456).	PDS Delphi survey and personal interviews.

No.	Time / Date	Topic / Issue	Participants	Format
5	March 2001	Testing the validity and importance of key elements in the research.	24 experts from 16 countries (WSSCC and IWA lists). Participation rate 15 % (24/166).	Group e-mail survey. Pre-structured questionnaire including open-ended questions.
6	March 2002	Private sector participation and PPP: Economic arguments and institutional constraints. (Article II), (Prinwass-project).	21 water utility managers and sector professionals from Finland. Participation rate 45 % (21/47).	Group e-mail survey. Pre-structured questionnaire: 11 questions on two thematic areas. Open-ended questions included.
7	July-August 2002	Private sector participation and PPP: “European water management between regulation and competition”. (Article II), (Aqualibrium-project).	24 water utility managers and sector professionals from Finland. Participation rate 40 % (24/60).	Group e-mail survey (semi-structured questionnaire). 18 questions on seven main thematic areas.
8	March – May 2003	Knowledge management and visionary management in water services. (Article V)	146 experts from 30 countries (mainly utility directors). Participation rate 16 % (23/146).	Delfix survey: 24 questions on eight main thematic areas.
9	March – May 2003	Water and sanitation policy and institutional reform. (Article I)	136 experts from 42 countries. Participation rate 10 % (13/136).	Delfix survey: 53 questions on nine thematic areas.
10	March – June 2003	Stakeholder roles and public-private co-operation. (Article II)	103 experts from 30 countries. Participation rate 17 % (18/103).	Delfix survey: 53 questions on 11 thematic areas.
11	March – June 2003	Effective economic instruments and financing of services. (Article III)	78 experts from 29 countries. Participation rate 6 % (5/78).	Delfix survey: 44 questions on nine thematic areas.
12	March – August 2003	Customer-responsive water and sanitation services. (Article IV)	87 experts from 28 countries. Participation rate 5 % (4/87).	Delfix survey: 31 questions on five thematic areas.

The figures and percentages of Chapter 4.2 indicate the responses of experts in the Delphi surveys on selected themes. For instance, 8/9 indicates that 8 experts out of 9 represented the mentioned view.

Electronic conferences and discussion groups

Relevant electronic conferences and discussion forums have provided outputs that complement the results of the Delphi surveys. Table 4.2 presents the electronic conferences and discussion groups and forums whose outputs and summaries were utilised in the expert argumentation analysis.

Table 4.2 Series of electronic conferences and discussion forums complementing results of the Delphi surveys.

No.	Time / Date	Title and details of e-conference / discussion forum	Research key element
1	January – May 2000	Small Towns Water and Sanitation. The Network on Services for the Urban Poor, WSSCC. UNCHS/Habitat Settlement Upgrading programme (SUP). http://www.jiscmail.ac.uk/files/SUP/synthesis.doc	1, 2, 3
2	September – November 2000	Institutional frameworks. Organised by Water Supply and Sanitation Collaborative Council (WSSCC), IMO group. http://www.jiscmail.ac.uk/	1, 2
3	2001	PPP debate. Organised by the African Water Page. http://www.thewaterpage.com/ppp_debate/	1, 2
4	July 2002	Toolkit for Improved Water Supply and Sanitation Services among the Urban Poor. Organised by the World Bank Water and Sanitation Program. http://www.jiscmail.ac.uk/files/SUP/Background_Paper_for_e-conference_7-2002_amended.doc	1, 2, 3
5	July 2002	Dialogue on effective water governance. Global Water Partnership (GWP) virtual dialogue, Virtual Water Forum (VWF). http://www.gwpforum.org/gwp/library/VWF-virtual	1, 2, 4
6	September 2002	Financing water services for the poor. Global Water Partnership (GWP) virtual dialogue, Virtual Water Forum (VWF). http://www.gwpforum.org/gwp/library/VWF-virtual%20finance-background.doc	3
7	November – December 2002	Water and sanitation – institutional options and financing. Organised by WSSCC, IMO group. http://www.ihe.nl/mai/default.htm?mai/imo.htm http://www.jiscmail.ac.uk/	1, 3
8	January 2003	World Water Actions. Organised by the Water Action Unit.	1, 2, 3, 4
9	March 2003	The public and private dimensions of the global water challenge. Organised by Global Public Networks (GPN). http://www.sdnf.undp.org/gpgn/topic02.php	1, 2
10	October – November 2003	Challenges of international goals in the water sector. Organised by International Water and Sanitation Centre (IRC). http://www.jiscmail.ac.uk/	1, 2, 3

The problem with the e-conferences and discussion forums was that the expert views brought forward there are very narrative, and it has been difficult to draw explicit scientific conclusions from them. The Delphi surveys carried out by the author enabled deeper scientific analysis of expert views, while the problem was the low turnout of experts as elaborated in Chapter 6.

4.2 Expert argumentation and analysis

4.2.1 Water and sanitation policy and institutional reform (Article I)

Article I deals with water and sanitation policies and sector reforms especially in developing countries. It highlights the lessons learnt from past development, addresses the main impediments to reform implementation, and suggests systemic and visionary approaches for future policy and reform processes. The findings of Article I and the expert argumentation have been used specifically in the case study analysis of the water services sector reform process in Kenya (Chapter 5). The following expert argumentation is based mainly on Delphi survey No. 9 and discussion forums Nos. 1-5 and 7-10 (Tables 4.1 and 4.2).

Policy reforms in selected developing countries

Recently, several developing countries have reformed their water and sanitation policies and institutional frameworks. Experts participating in related Delphi surveys considered the recent reform processes successful, for instance, in South Africa, Uganda, and Porto Alegre in Brazil. On the other hand, the reform processes in Argentina, Ghana, Kenya, Mexico, Namibia, Nepal, the Philippines and Tanzania were considered unsuccessful. Reform processes usually take a long time and proceed gradually and, therefore, in some countries the process may at first seem like a failure (for instance in Kenya and Namibia) although stepwise improvements are still underway. In most countries where the reform process has not progressed, the reasons usually include (1) difficulties in separating the roles of policy making, water resources management and service provision, (2) lack of political commitment and facilitation, (3) inadequate attention to dissemination and capacity building at lower levels, and (4) inappropriate and too direct adoption of policy and institutional arrangements from developed or donor countries.

Policies and strategies of donors and ESAs

Effective water-related institutions are necessary to ensure appropriate implementation of policies. An enabling and empowering policy environment and institutional structure are a universal requirement for success. However, institutional and policy issues have to be dealt with differently at the international (global), national and local levels. The concept of appropriate water policy is not universal and, thus, has to be considered and tailored case by case, as pointed out in Article I.

It looks like most governments have until recently supported state-of-the-art water and sanitation policies. Many policies and reforms have been donor-driven and linked to structural adjustment programmes. Thus, governments have not themselves spearheaded the development of sector strategies advocating water management principles in accordance with the agreed principles of major international agreements and organisations, such as the principles of the Dublin Statement and Rio Earth Summit agreements (Article I). Besides, reforms have often been based on over-optimistic plans ignoring the fact that reforms actually are lengthy and complicated, and should not exceed the capacity of local organisations.

WSS sector policies and strategies of donors and international organisations, again, have evolved over a long period of time and seem to a large extent to follow certain fashionable trends (Article I). As most of the respondents (8/9 = 89 % of respondents) in Delphi survey No. 9 agree, these policies and strategies have focused on a limited number of fashionable

themes while many other important aspects of holistic strategies have been neglected. Figure 4.1 shows a sketch of such “dynamic rotation of fashionable trends”. While this phenomenon indicates a certain lack of a systemic approach, it also provides an empirical learning process that will help us improve policy development in the future. Thus, in the future, the *systemic policy and strategy concept* should cover the important principles and issues in a cumulative and balanced manner, to enable development of viable water and sanitation services.

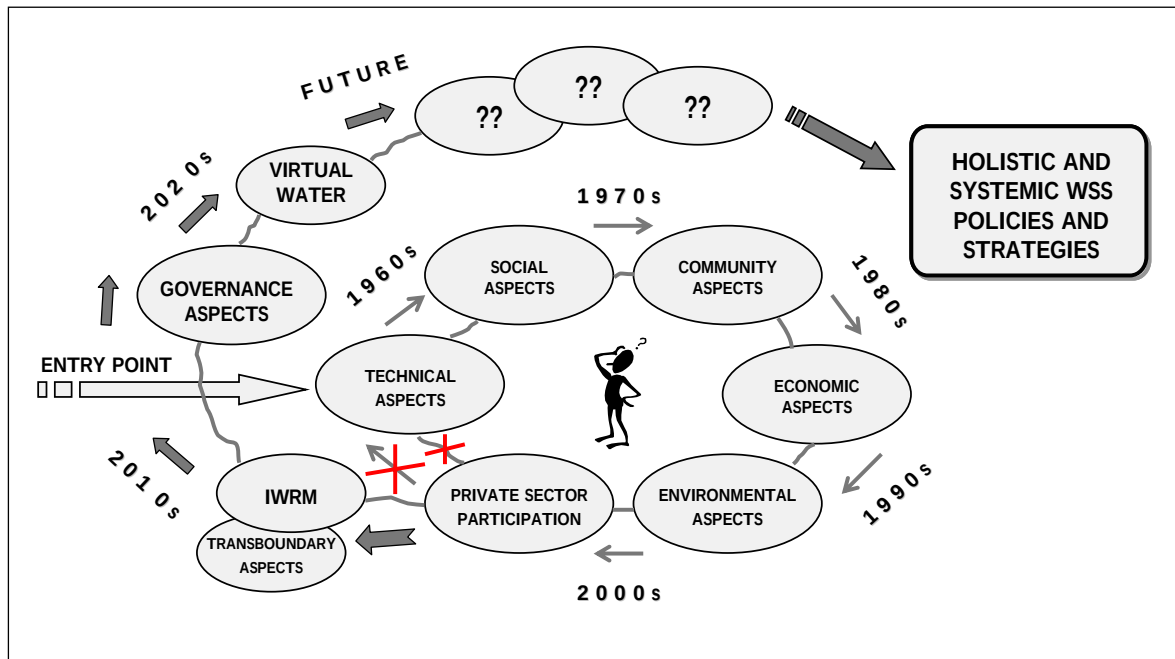


Figure 4.1 Development trends and priority elements in international water policies for developing countries in the last few decades.

Barriers to implementation of policy reforms

Water institutions, broadly understood, include (1) water policy, (2) water legislation (water law), (3) water administration, and (4) informal institutions. Despite many successful cases, implementation of water policies has not generally been very successful. It is easy to formulate policies, relatively easy to enforce legislation, but much more difficult to change informal institutions (such as attitudes, human and organisational behaviour, codes of conduct and behavioural patterns). As concluded in Article I, the factors that impede decision making, action, and implementation of policies and reforms seem to be similar everywhere and largely independent of nationality and culture.

The most important barriers to policy reform implementation and their rating according to the expert survey are as follows (Article I, p. 386, Fig. 1):

- Political differences and inadequate political facilitation (8/9 = 8 answers out of 9 participating experts)
- Institutional constraints (fragmentation of institutions, inadequate incentives) (8/9)
- Strategic constraints (lack of clear-cut strategies and goals) (8/9)
- Socially and/or culturally unacceptable policy (7/9)
- Planning inadequacies (non-integrated planning, unrealistic action plans, too short-term planning) (7/9)

- Complexity of issues (poor understanding of the magnitude of problems, or consequences of problems) (7/9)
- Consensus and co-ordination constraints (implementation blocked by other governmental departments, conflicting interests between stakeholders) (7/9)
- Information and communication constraints (lack of accurate, reliable and sufficient data and information) (6/9)
- Disinterest in the future (myopic approach: near-term issues stressed more than long-term issues; lack of visionary thinking) (6/9)
- External factors (such as poor public servant morale and public resistance) (6/9)
- Economically or financially infeasible policy (4/9)
- Being overly optimistic about availability of human resources (4/9)
- Technically inadequate or inappropriate policy (3/9)
- Contradiction with constitutional requirements (2/9).

Although these impediments are diverse and difficult to overcome, it is possible to define the key requirements and overall remedies for improving policy and reform implementation, as discussed in more detail in Article I.

Key requirements and approaches for success

The key requirements and approaches for success in water policy and institutional reform implementation as discussed in Article I were rated by the experts as follows:

- Commitment of policy makers and politicians (9/9)
- Institutional change and factors contributing to it (9/9)
- Development of enabling “incentive environment” (9/9)
- Integrated, comprehensive and systemic approach (8/9)
- Institutional incentives, organisational incentives, and staff incentives and motivation (8/9)
- Effective communication and dissemination (8/9)
- Effective stakeholder participation at all levels (7/9)
- Development of adequate capacity for implementation at all levels (7/9).

The sequencing of reforms and creation of consensus among stakeholders is essential for success. Policies as such do not trigger development, but a comprehensive approach is needed. Good policy documents – policy statements – as such do not ensure successful implementation of the policy. Institutions matter – sustainable development should be rooted in processes that are socially inclusive and responsive to changing circumstances. Action plans and strategies for implementing policies should be realistic in terms of timing and resource utilisation. Ultimately, the water policy must be appropriate for the social and economic context in which it is implemented (Article I). Demonstration models of successful reforms in other countries assist implementation, but copying policy and reform models too directly from other countries can be unsustainable.

Institutional change

Institutional change is a prerequisite for successful water policy implementation and reform. Theoretical considerations on the institutional change were presented in Chapter 3.4.2. Most experts (6/9 = 6 out of 9 experts) consider that an institutional change is needed to trigger the reform process. Informal institutions are more difficult to change than formal institutions (6/9). Most experts consider institutional change as a gradual and incremental process (6/9) which can be made to move on stepwise (6/9). Institutional change rarely requires a “shock effect” (e.g. budget crisis) (3/9). It is usually best to start

the reform process by first implementing the easiest parts even if they are not the most crucial (6/9). Since institutional change is a continuum, the easier reforms initiated in the early stages brighten the prospects for further and higher-level institutional changes. Active initiators (“champions”) are important for starting institutional changes for reform processes. Institutional changes occur when opportunity costs (that is, the potential net gain) surpass the transaction costs related to the reform process. There is a linkage between the transaction costs of subsequent reforms and the opportunity costs of earlier reforms. The opportunity costs of institutional change within the water sector can also be strongly influenced by factors originating in other sectors of society, such as political reforms, economic liberalisation, and international trade (Article I; Saleth and Dinar, 1999). This emphasises the holistic approach to water sector reform, which requires an understanding of wider development issues as discussed in Chapter 3.3.

Integration of policies

Thus, water policies should be adequately integrated and linked to other development sectors, otherwise their implementation will not be successful. Integrated water resources management is highly appreciated, but integration is still often limited even within the water sector. An integrated and systemic approach in policy development and sector reform is advocated, but practical policies are often traditional and non-integrated (7/9). On the other hand, the more holistic and integrated the policies are, the more difficult it is to implement them in weak institutional environments. Water resources management and water supply aspects need to be closely integrated in policies, but in implementation service provision should be clearly separated from WRM and policy making. However, integration of water supply and sanitation services should be the first practical step in implementing integrated water resources management (IWRM). The inherent limitations of the existing institutions in dealing effectively with the new set of problems are not related to water resource development but to resource allocation and management. Water institutions have to be reoriented to reflect the changing supply-demand and quantity-quality realities. Many countries have prepared new legislation for integrated water resources management, but in very few cases have all structures been changed in accordance with the new approach (WWC, 2003b, p. 26).

Stakeholder roles

The roles and responsibilities of various stakeholders and their involvement, participation and facilitation in the reform process are essential for success. Stakeholders include decision makers, politicians, administrators, professionals, users (customers) and community groups, the commercial and private sector, non-governmental organisations, advocacy organisations and other interest groups (Article IV). The water services sector is also increasingly becoming a part of the network economy (Chapter 3.4.3), and therefore the roles and recognition of diverse stakeholder groups need to be emphasised more than in earlier. All responding experts (10/10) considered that, in the past, most policy and reform processes in developing countries have in fact been too donor-driven. Also, the role of the central government has often been too dominating (5/10). More participatory approaches to reform and policy processes are needed to ensure commitment and build up the confidence of all stakeholder groups. Neutral platforms are required to offer stakeholders the opportunity to participate and express their views.

Capacity building in the reform process

Policy and institutional reforms are essential for encouraging and attracting human, technological and financial resources for achieving the Millennium Development Goals (MDGs) and the goals set at the World Summit for Sustainable Development (WSSD), as described in Chapters 1 and 3.3. Implementing a policy and reform process requires substantial resources, capacity and new skills at all levels. Most developing countries that are reforming their water sector have significant capacity constraints, and their requirements of capacity building are often underestimated. Capacity limitations apply to both institutional and organisational capacity and managerial skills. Especially the availability of human resources at various levels often constrains the reform process. Inter-disciplinary research and development of new technologies is also rare because of these capacity constraints.

In the past, the capacity building support to the policy development process focused mainly on the water resources management (for instance WBI support, as mentioned in Article I) and only marginally on the water and sanitation sector (6 out of 10 experts). Often capacity building becomes an end in itself, although it should always be performance-related. Recently, the Netherlands funded and UNDP-supported global Cap-Net network has started commendable capacity building programmes for policy reforms.

Sound water management principles

Policies, roles of organisations, legislation and strategies are all based on certain fundamental principles that are intended to be translated into practice. Based on a review of the principles adopted by major international organisations, the following weighted rating was based on expert views about the importance of various principles:

- Integrated (comprehensive) approach / river basin approach (21/30, weighted average of answers in the Delphi survey)
- Emphasis on environment / integration of water into environment (9/30)
- Publicity and participation of interested parties (22/30)
- Water resources management at the lowest possible level in accordance with the Dublin principles (13/30)
- Separation of responsibilities, participation of public and private sectors and NGOs (11/30)
- Full cost recovery (financial autonomy) and “polluter pays” principle (17/30)
- Recognition of affordability issue and minimisation of subsidies (16/30).

This shows that an integrated and systemic approach is essential, and policy reform should be a transparent process involving all relevant stakeholders.

Meeting the water security needs of the poor requires stronger and more efficient governance arrangements (GWP, 2000; WWC, 2003b). There is a need for a stronger legal and legislative basis than currently exists, both nationally and at the global level. The issues of water rights and water quality are not presently adequately addressed by international or national laws, keeping in mind that the number of both public and private water service providers and producers is constantly increasing (WWC, 2003b).

4.2.2 Stakeholder roles and public-private co-operation (Article II)

Article II deals with the role of the public and private sectors, their relative efficiency and implications for performance, as well as analysis of various management options. The statements and findings of Article II were tested in Delphi survey No. 10, and the expert argumentation is summarised in the following. In addition, the results of Delphi surveys Nos. 3, 4, 6 and 7 have been used in the synthesis. Additional contributions are based on discussion forums Nos. 1-5 and 8-10 (Tables 4.1 and 4.2).

The changing roles of the public and private sector

The main responsibility of supplying water and sanitation services has been with public agencies in most developing countries as well as worldwide. Recently, in many developing countries – including many of the target countries of Finnish development co-operation – the role of the public sector has been changing from service producer to facilitator and regulator. The new water policies of developing countries have taken into account this need for change, and in many cases water ministries wish to hand over the responsibility for implementation, service provision, and operations and maintenance to local governments, consumers groups, or the private sector. This is one of the biggest global mega-trends changing water policies and institutional arrangements, as shown in Figure 4.1.

In most cases, models for privatisation of the water sector have been adopted from developed countries, especially from France and England. As pointed out in Article II, privatisation and public-private partnership (PPP) have in most cases been applied without adequate related research and consideration of their real benefits. In developing countries, the historical background and nature of the public sector have been significantly different from those of most developed countries, and thus the models applied in the developed world do not always succeed in developing countries (11/20 experts).

In this changing policy environment, both in developed and developing countries, three distinct principles have to be applied when allocating roles to various sectors:

- Policy making should remain with the government
- Regulation should be undertaken by an independent and trusted agency
- Service provision should be by professionals; separation between the business of service production and the business of governing is required.

The roles of the public and private sector and comparison of their performance in the water services sector have been discussed in Article II and in Chapter 3.4. This research relies on the theories of institutional economics (Chapter 3.4), which has a more holistic approach to economic performance and efficiency than neoclassical or neo-liberal economics.

Features of water and sanitation services

Neo-liberal approaches to infrastructure services assume that water and sanitation services are basically similar to any other technical services (electricity, telecommunications, etc.). However, the majority of experts (11/20) clearly consider water services a natural monopoly and think that they cannot be treated in the same way as other infrastructure services. Neo-liberal approaches apply to spot market exchange, which does not happen in water services, especially in the poor neighbourhoods of developing countries. Water supply and sanitation have special characteristics that differ from most other infrastructure sectors, with their own ontology regarding the environmental, health, social, ethical, equity and gender dimensions.

Efficiency considerations and ownership

The identified inefficiency of public water utilities in developing countries has been one of the main arguments for increased private sector involvement. The majority of the interviewed experts think, however, that private enterprises are not necessarily any more efficient than public utilities (weighted average -6/20). Developing countries have significant differences in relation to the role and effectiveness of the public sector. Improved efficiency of the public sector may in many cases bring more sustainable results than privatisation or public-private partnerships. The performance of public water utilities should actually be assessed against the targets set for them by their public owners (6/20).

In the 1990s it was commonly believed at least by some major international donors, that the privatisation of water services would solve sector viability problems. Yet, private provision and ownership of water services and facilities was practiced throughout the Western World in the 19th century. The results were not significantly superior to those of public services – in many cases the opposite was true. The need for privatisation and private operations has commonly been justified by the efficiency of operations and cost savings. However, transaction costs have not usually been fully considered when assessing overall costs and efficiency. Moreover, the terms and definitions used in the privatisation debate have often been fuzzy. Operational efficiency (6/10) and economic efficiency (5/10) are more important than the allocative efficiency (3/10) emphasised by neoclassical economics (Chapter 3.4).

Argumentation and debate on the (in)efficiency of the public sector and public water utilities has indeed increased. The main argument for supporting privatisation and private operations has been higher efficiency (and effectiveness) of the private sector in all conditions. However, these claims have usually not been based on scientific evidence (Article II; PRINWASS and AQUALIBRIUM projects). On the other hand, there is research evidence from the water services sector showing that the public sector is often even more efficient and effective than the private sector (Boyne, 2002; Braadbaart, 2002; Pint, 1991; Willner, 1997, 2001, 2003).

It is commonly argued that public ownership always reduces efficiency. The property rights theory posits that private enterprises are more efficiently managed than public ones. Yet, several studies contest these claims. Willner's (1997, 2001, 2003) studies based on about 50 cases indicate that public ownership is usually not any worse option than private ownership, and in some sectors (including water services) it even seemed to be better. Braadbaart (2002) tested the ownership effects in both static and dynamic settings. Effects of ownership on efficiency are difficult to measure: neither static nor dynamic water industry analyses clearly proved the ownership effects hypothesis. According to Braadbaart (2002), privatisation has a positive efficiency impact on the water industry only in conjunction with supportive sector reforms. Increased private involvement alone is not a panacea (Braadbaart, 2002; Hukka and Katko, 2003a,b). Yet, privatisation may in some cases essentially reduce counterproductive government interference. On the other hand, successful reform may not always require privatisation (Braadbaart, 2002).

Thus, ownership of utility assets is clearly not a determining factor for performance and efficiency. Both public and private water utilities can be efficient and perform well (14/20). Among the participating experts, municipal ownership of utility assets was clearly considered most preferable (6/10).

Public ownership can be justified by behavioural reasons. The objective may be to improve allocative efficiency, which is related to the total allocation of resources in a national economy. Economic efficiency refers only to the efficiency of asset (production input) use (Box 3.4 in Chapter 3.4.2). Traditionally, the business economic operational approach has been considered inappropriate for public services. Public ownership cannot always be justified by the need to implement the intended behaviour. Public ownership is not necessarily always the best way to remedy market failures, but a public enterprise should not be judged merely on its poor profitability, if its existence is justified by structural reasons, such as employment in a particular area, or behavioural reasons – such as an attempt to bring service access to users (Willner, 1997, pp. 25-26, in Lehto, 1997). The only reasonable way of assessing the operations of a public organisation is to determine how well it achieves its objectives (Rees, 1984, p. 11, cited by Willner, 1997, 2003). It is often claimed that a decentralised ownership base and lack of clear objectives are the main causes of the high costs of public sector services. However, private sector ownership may also be decentralised, which does not necessarily reduce efficiency. Neither does public ownership as such imply unclear objectives (Willner, 1997).

The fact that the external goals of a company, internal distribution of surplus and genuine differences in technical and organisational efficiency may often be confused, confirms the suspicion that the efficiency of the private sector is largely a myth (Willner, 1997, p. 31). Competition and ownership may affect allocative efficiency as well as productive efficiency (Lehto, 1997, p. 8; Article II).

The claims about the inefficiency of the public sector are usually based on the assumed poor performance of its managerial level. In the private sector, the performance of managers is largely measured in terms of the returns they secure on investments. Consequently, it is believed that the managers of private companies have a strong interest in efficiency and innovation which translates into efficiency. Public utility managers are often political appointees and consequently inclined to serving the interests of the politicians that appointed them. Professional utility workers are often strongly influenced by conservative professional standards.

Performance constraints and indicators

The performance of water service organisations can be assessed against agreed and accepted criteria, for instance standardised performance indicators (Alegre et al, 2000; Articles IV and V). Performance indicators can in general be grouped into: (1) water resources indicators, (2) personnel indicators, (3) technological indicators, (4) physical indicators, (5) operational indicators, (6) levels-of-service indicators, and (7) financial indicators (Alegre et al, 2000).

The ongoing debate on private and public sector efficiency shows that the current performance indicators may be inadequate, which was pointed out by several experts (weighted average 6/20). In any case, performance indicators work best when used to evaluate a single water utility – comparisons between utilities are always, at best, only indicative. The use of performance indicators depends on the “weights” attached to them, which makes it more a “social” than a “technical” issue. Instead of standard performance indicators, more flexible indicators may be needed for developing countries where performance problems are much more complex than in developed countries. For example, in Kenya water utilities hardly ever apply appropriate performance indicators (Article V; Chapter 5).

Regulatory framework

Because water is both an economic and social good, unregulated market forces can never completely and equitably satisfy local objectives (Gleick et al, 2002). An appropriate regulatory framework and competent regulatory agencies are needed both in public and private operation of water services. In developing countries private sector participation (PSP) and public-private partnerships (PPPs) are constrained by inadequate regulatory framework and capacity. In the prevailing management and administration culture of these countries, for example in Kenya, appropriate control and regulation of the private sector actors is very difficult. Establishment and running of the required regulatory system is not possible with the present financial and human resources (Chapter 5).

In the heated privatisation debate, the need for economic (price) regulation has been emphasised. However, whether water services are private or public regulation may be needed in all the following areas:

- Economic (price) regulation
- Environmental regulation
- Water quality regulation
- Technical regulation (standards etc.)
- Service quality regulation
- Business operations
- Assets management.

Arranging effective regulation may be even more difficult for developing countries than management of water and sanitation services as such. In many reform processes, such as in Kenya, the need for regulation seems to focus on economic regulation (Chapter 5). It is too often assumed that one overall regulatory body is capable of overseeing all these regulatory fields, which is hardly possible. It may be best to start with economic regulation and develop the other fields gradually. Economic regulation cannot always be truly independent. Competition between regulators may be useful, but privatising regulation may have serious undesired consequences as discussed in Article II.

The experts who participated in the Delphi surveys argued that developing countries require a strict, comprehensive and independent regulatory system due to their severe governance constraints, such as poor transparency, low accountability, and high corruption (weighted average -11/20). On the other hand, the regulatory framework of developing countries should be designed to meet the needs and overall institutional capacity of each country. The regulatory framework should be tailored to local conditions and not copied from developed countries. It was also emphasised that regulation is usually needed at various levels. Often only the national level regulatory system is considered in reform processes. On the other hand, “self-regulation” through the local government has worked well in many countries.

PSP contracts and risks

In addition to a functioning regulatory system, the delegation or outsourcing of utility operations to private companies requires clear contracts and agreement concerning the sharing of risks between public and private partners. Contracts often tend to be incomplete by nature, which leads to hazardous contracts and inefficiency (weighted average 8/20). Incomplete contracts and long contract periods lead to unforeseen development, which may result in a costly renegotiation and arbitration process (12/20). In delegated contracts,

transaction costs are huge and may undermine the efficiency gains from private operations (4/20). Contracting water services to a vertically integrated private company may seem to reduce transaction costs by making them internal, but in practice this leads to a non-competitive situation (11/20). In case of contract failure, the public partner eventually always bears the biggest risk – no matter how comprehensive the contract has been (3/20). The private sector usually prefers long contract periods in order to minimise risks and maximise profits, but public sector clients prefer short contract periods which enable them to minimise their risks and ensure adequate competition. The trend is toward shorter contract periods compared to the first PSP contracts (30 years and over).

Type of private sector participation in developing countries

Private sector participation (PSP) or public-private co-operation (PPC) can take a variety of forms. The preferred form and its tailoring depend on the local conditions. The type of institutional set-up the country has is important. Reforming the water services sector of a developing country usually involves a multitude of choices, each with its own set of problems and opportunities – “*institutional diversity*”. In the case of small communities, informal private sector participation, community management, and municipal management should be considered. Poor rural communities are unlikely to be attractive to large private companies. Privatisation without regulation cannot be considered, as pointed out in Article II. Affordability of service and affordability to the poor are separate issues. Issues related to investment phasing and tariff control are important.

Often private sector participation (PSP) and public-private partnerships (PPP) are only considered “formal” agreements – the extreme interpretation being a private finance initiative (50/50). Yet, in many countries public (municipal) water utilities have a long tradition of outsourcing non-core services and goods supply at a significantly high rate. Outsourcing rates can be up to 80 per cent of the utility’s turnover or cash flow. Thus, public-private co-operation (PPC) would be a better term to describe the diversity of PSP options than PPP (weighted average in the Delphi survey 10/20).

Privatisation may appear most attractive in countries whose governments have been the weakest and failed to meet basic needs. In countries where public agencies have been able to produce water services effectively and equitably, the pressure and attractiveness of privatisation is substantially lower. Yet, according to Gleick et al (2002), the risks of privatisation are also highest where governments are weakest. Experts of the Delphi surveys also clearly concluded that full privatisation (divestiture) is not a feasible option in developing countries. Other PSP options, such as concession, lease, BOT/BOOT, management contract, or service contract, can be feasible in certain conditions. Yet, there are serious concerns about the future sustainability of utilities in developing countries where long-term concession contracts have been made without establishing the appropriate regulatory, control and supervisory capacity within the public sector. Concessions run by private operators may be successful in developing countries over the short term in effecting improvements in service and infrastructure. However, long-term concessions inevitably cause loss of local expertise and resources. Especially after the contract expires, local water utilities no longer have the capacity to resume operations. Therefore, capacity building should always be included in PSP contracts as pointed out in Articles I and II.

Private sector capacity

The public sector as well as the private sector suffers from major organisational and other capacity constraints in most developing countries. Local private sector capacity is

especially limited at the decentralised level and in rural areas. According to the Delphi survey No. 10, expected increase in the private sector involvement may be hindered by:

- Limited access to credit facilities (4/10 = 4 experts out of 10)
- Difficulties in attracting skilled personnel (1/10) (especially outside capitals and major cities)
- Poorly functional legal systems (2/10)
- Poor accountability of public authorities as contract partners (5/10)
- Low business and profit expectations (0/10) (especially in rural areas)
- Poor overall economic situation (4/10)
- Low status of the water sector (1/10).

Major international private operators are unlikely to be interested in the rural areas or small towns of developing countries. On the other hand, the private sector also includes informal small service providers, which have become important especially in peri-urban areas. The increased role of the private sector has also affected the availability of skilled personnel to the public sector. The public sector often loses professionals to the private sector. Local private sector capacity can be strengthened by local training arrangements (6/10), by twinning with foreign private operators (3/10), and by supporting informal small-scale service providers.

Role of local government and municipalities

As mentioned earlier, the responsibility for water service provision and production has rested mainly with the central government (state) in many developing countries. Local governments and municipalities have not had a major role, and their overall performance has been poor. Yet, in many developed countries municipalities and other local government structures have an active role in water service provision and their performance is good.

Therefore, in countries where (democratic) local government (municipal) structures exist, or can easily be (re)constructed, it would be preferable to base water and sanitation services on these local government structures, rather than push for privatisation or foreign operator contracts. Direct municipal management has proved successful in many European countries. Autonomous municipal management through commercialised public enterprises – such as those in Finland – has to a large extent avoided the bureaucracy and political interference of direct municipal management while bringing efficiency gains similar to those of the private sector.

Experts consider (weighted average 12/20) that the performance of local government-based water utilities can be improved by various public sector reforms, such as increasing autonomy, public enterprises, corporatisation, budget reforms, and output-based budgeting. A comprehensive local government policy reform is more preferable than diverting completely from public water services to private services (9/20). On the other hand, in countries where local government structures seem to be very difficult to strengthen, short-term management or concession contracts may be feasible (6/20). But adequate regulatory capacity has to be created in all types of arrangements.

In developing countries where the central government earlier played the key role in water management, decentralisation has commonly been a key objective of the institutional reform programmes. It is important to enhance citizen's participation in local development. However, many local government organisations are heavily constrained by lack of financial resources, weak administrative and technical capacity, and local power structures

that do not favour social equity in service provision. There is no single approach to effective decentralisation and local government capacity building. As emphasised in Articles I and II, reforms must be case-specific based on available resources and capacity, as well as the institutional, social and political realities that govern the appropriate and realistic scope and pace of decentralisation. Yet, most countries face similar or analogical problems and constraints.

Some policy reforms at the central level are necessary for constructing the foundation for a sustainable system of local government. A good policy framework articulates a clear vision for decentralisation and defines the basic rights and responsibilities of different actors. It is difficult to operationalise reform in a complex institutional environment, but building adequate consensus among stakeholders is critical. An effective decentralisation programme requires a strategic implementation approach. Reforms should not be imposed too quickly, and they should usually be staged in short logical steps. Experts advise that reforms that have the greatest possibility of succeeding in a relatively short time should be undertaken first, although it is important to set clear priorities. It is also useful to differentiate between local governments, because some are likely to be relatively capable and can be given greater responsibility, while others require substantial technical assistance. According to Smoke (2000), decentralisation and local government reform need to be framed in broader institutional terms than merely shifting power from central governments to local governments. Decentralisation may sometimes involve a modified and/or increased role for centralised agencies, at least in the early stages.

4.2.3 Effective economic instruments and financing of services (Article III)

Article III deals with financing constraints, appropriate pricing and cost recovery, and financing strategies for water and sanitation services in the future. The findings of Article III were tested in the Delphi survey No. 11. The expert argumentation from this Delphi survey and additional contributions from discussion forums Nos. 1, 4, 6-8 and 10 are summarised in the following.

Water infrastructure financing constraints

Inadequate financing is a major constraint on the development of new and rehabilitation of existing water infrastructure in developing countries. Currently, about USD 27-30 billion is spent annually on the water and sanitation sector of developing countries. It has been estimated that annual investments in water infrastructure, mainly in developing countries, should be increased to about USD 180 billion to achieve the service coverage targets up to 2025 (Terry and Calaguas, 2003; WWC, 2003b).

The main reasons for the inadequate financing of water and sanitation services in developing countries are:

- Poor overall economic situation
- Poor financial management, accounting, and budgeting procedures
- Poor cost recovery.

The inadequate financial resources of local government authorities are mainly the result of inadequate taxation procedures, limited local revenue, and inadequate central government allocations.

Other economic and financial constraints

Although the lack of financial resources is a major constraint on the future development of water and sanitation services, availability of financial resources alone will not solve problems. As pointed out in Article III, other factors that contribute to the problems are:

- Weak sector institutional structures/arrangements and poor incentive environments
- Inappropriate pricing policies which are not conducive to long-term sustainability
- Insufficient appreciation of the role of effective demand in the investment process
- Difficulty in devising charging structures and mechanisms that are effective in generating resources but also protect the interests of the poor
- Lack of suitable financial intermediaries to facilitate funding of large-scale investments.

Financial flows to the water and sanitation sector

Financial flows to the WSS sector come from several sources: external development assistance, loans, grants, international private sector investments, domestic private sector investments (including small-scale private providers), public sector budgets, and individual household and community investments. In general, developing countries spend 1-3 per cent of their government budgets on low cost water and sanitation. Total annual financial flows to the WSS sector in developing countries currently amount to USD 27-30 billion (Terry and Calaguas, 2003; WWC, 2003b).

International and domestic private sector investments account for about 10-19 per cent of the current total investments in the WSS sector in developing countries. There was a drop of 45 per cent in private infrastructure financing between 1997 and 2002 (Terry and Calaguas, 2003). It is probable that the private sector is not willing or able to fill the gap in financing future investment needs. External development assistance now covers 20 per cent of the WSS investments in developing countries. Increasing efforts should be made to increase bilateral aid flows – from the current average of 0.24 per cent of GNP to 0.7 per cent. Increasing efforts should also be made to increase multilateral aid flows.

According to experts, public sector efficiency reforms and reallocation of domestic public sector resources is the most important way of securing future investments. Greater domestic public sector resources can best be mobilised through good governance – including accountability – and tax reforms to strengthen the revenue base and collection.

Increasing public sector investments in the WSS through debt relief to highly indebted poor developing countries (HIPC) is not a very effective measure. Increasing household and community financing according to the “user pays” principle will significantly assist in filling the investment gap. Global initiatives, such as the 20/20 initiative and Agenda 21, are another key for developing innovative financing mechanisms and should, therefore, be given increased attention.

Pricing and tariff policies and cost recovery

Water allocation and pricing decisions are mainly policy and political decisions. The lack of funding for water investments and operations is actually a result, not the root cause of the political, institutional and social reasons for failures. The approach to water pricing policies changed in the 1990s, and water was recognised as an economic good (Dublin principles). A prerequisite for viable water and sanitation services is that all costs arising

from the service must be covered, either by water users or from general public revenue or the public budget.

In practice, many developing countries, including Kenya, still apply pricing and tariff policies that do not adhere to the principles of cost recovery (Chapter 5). As concluded in Article III, full cost recovery (FCR) should be the overall policy principle, but in developing countries it is often better first to aim at full financial cost recovery (FFCR), and gradually move towards full cost recovery (FCR). The earlier commonly set target for the developing countries to aim only at supply cost recovery (O&M and capital costs) is neither realistic nor acceptable. Objectives of the WSS tariff policy are diverse: (1) social, (2) financial, (3) economic, and (4) political (Article III).

In developing economies water tariffs are generally below the financial cost of water, and wastewater charges are often not applied. Low water charges and poor recovery rates risk the efficient maintenance of existing water infrastructure as well as additional investments in future water development projects. In reality, application of higher water charges in developing countries would often increase equity. Recently, tariff structures have improved in most countries. In the future, sustainable demand-based strategies should be applied to complement water pricing based on full cost recovery.

Affordability and subsidies

The challenge is to manage water in a way that adequately reflects its economic, social, environmental and cultural value with regard to all its uses, and to move towards pricing water services to meet the cost of provision. This approach should take into account the need for equity and the basic needs of the poor and the vulnerable. Methods that secure the affordability of water by the poor are generally based on subsidies. Subsidies are still common both in developed countries and in developing countries. Subsidies, either intentional or unintentional, exist between various water use sub-sectors and between various domestic user categories. In certain cases subsidies are acceptable, but they should always be transparent and justified. For instance, subsidies for the poor in accordance with the principles of "free basic water" in South Africa can be justified. In Africa, a practical option is to support pro-poor policies internally through increasing block tariffs (IBT) or consumption cross-subsidies.

Irrigation water has commonly been strongly subsidised, but in future it should be charged for according to the actual cost. A transparent process needs to be set in place to provide accountability for the overall management of the utility and on the use and impact of subsidies. In some cases tariffs can be used as an instrument to generate resources to support investments in appropriate sanitation services.

Metering, billing, revenue collection, accounting, and financial management

Appropriate tariff policies and pricing of WSS services are essential, but proper enforcement of tariffs, effective metering, billing and revenue collection is equally important, and effective accounting and financial management of water utilities is needed to ensure cost recovery and good economic performance of utilities. Water metering has also made it possible to apply marginal cost pricing. Household water metering facilitates effective and equal enforcement of tariffs and should thus be applied whenever feasible. Contrary to common arguments, the cost of household water metering is not too high in most developing countries and should not be used as an excuse not to apply metering. Prepaid water meters are promising and could be taken in use especially in rural areas.

Billing efficiency is usually low in developing countries. It can be improved by more efficient metering, raising the motivation of staff, training the billing staff and improving their skills. Low revenue collection efficiency can be improved by better staff discipline, by fighting against corruption, and by more efficient attendance to customer complaints. Water utilities in developing countries commonly need more autonomy in tariff setting and financial management.

Economic and price regulation

A typical problem in developing economies has been that the tariffs have been too low compared to the actual cost of service production. Yet, it has been commonly agreed that independent economic and price regulation is necessary also in developing countries. Experts clearly agreed that independent economic and price regulation is needed in all cases – whether the service producer is public or private. Establishment of an appropriate regulatory framework to balance the requirements for long-term financial sustainability with social and political considerations is a central element of sector reform.

Thus, experts clearly consider that water services should not be left solely under market regulation. Deregulation is not a feasible option, although in developing countries establishment of adequate regulatory capacity is difficult. Despite the governance problems in developing countries, regulatory systems should be fairly lenient and not too bureaucratic. Yet, regulation should be adequately elaborate and strict, because poor governance and morale systems do not work "voluntarily". Self-regulation does not work well in developing countries and compliance is often poor in practice.

Innovative financing mechanisms

In general developing countries still lack suitable financial intermediaries to facilitate funding of large-scale investments. New innovative financing mechanisms have been developed especially for rural community WSS services. Examples include revolving funds and various types of social and trust funds, such as the Grameen Bank, Mvula Trust, and Habitat Trust Fund. Most of the innovative financing mechanisms – such as social funds – can only assist communities in financing O&M and minor investments, but they cannot fill the major investment financing gap. Most trust funds planned at the national level still rely heavily on donor funding, and thus do not significantly reduce donor-dependency.

Private sector participation is one way of accessing new resources. During the 1990s and the early 2000s it was still strongly believed that private sector financing would solve many of the financing problems in the WSS sector. In fact, one of the key justifications for increased PSP was the assumption that private financiers would help solve especially rural WSS funding constraints. In reality, there has been a drop of 45 per cent in private infrastructure financing between 1997 and 2002 (Terry and Calaguas, 2003). Contrary to the earlier strong support for privatisation, even the World Bank is now emphasising output-based aid, which combines private sector participation with public subsidies for the poor (World Bank, 2003b). One of the new tools developed as part of the Action Plan is REDI or "Recent Economic Developments in Infrastructure" that analyses countries' infrastructure performance and needs. The Action Plan highlights linkages with the Millennium Development Goals (MDGs).

Key elements of sustainable financing and cost recovery in water services

Brikke and Rojas (2002) have divided the key factors contributing to cost recovery in the context of community-managed water supply systems into seven main categories: (1) Setting a strategy, (2) Improving willingness to pay, (3) Optimising costs, (4) Establishing clear financial responsibilities, (5) Setting an appropriate tariff, (6) Improving access to alternative finance, (7) Organising effective financial management. This framework has been further elaborated in Article III.

Some experts see the current constraints on financing and cost recovery mainly as political, and urge for more openness in the debate. Cost recovery, tariff setting, revenue collection and other key elements of sustainable financing should be put in the perspective of developing realistic policies and strategies. These strategies should acknowledge water and sanitation as both basic needs and human rights, while also clearly defining how the financing gaps at local and user levels can be filled. It is important to remember that in addition to the cost recovery constraints at the operational level, the investment financing needs for the water and sanitation infrastructure are still huge (Chapter 1; GWP, 2000; WWC, 2003a). The three-phase strategy for implementing the proposals of the latest financing strategies is expected to answer some of these questions, as outlined in the so-called “Camdessus Report” (Winpenny, 2003, p. 35).

4.2.4 Customer-responsive water and sanitation services (Article IV)

Article IV deals with the role of customers as key stakeholders in water services and describes the need to improve customer-responsiveness of water utilities especially in developing countries. The findings of Article IV were tested in Delphi survey No. 12. Expert argumentation from this Delphi survey and additional contributions from discussion forums Nos. 5 and 8 are summarised in the following.

Stakeholders and their roles in WSS

Water services and water utilities, especially in developing countries, have traditionally focused on supply-driven production, but have recently become more interested in demand- and customer-oriented services. The role and importance of various stakeholders is also better understood (Chapter 3.4.4). The most important stakeholders in water services are: (1) water utilities, (2) consumers or direct users, (3) indirect stakeholders, (4) proactive stakeholders (such as environmental pressure groups etc.), (5) policy-making bodies, (6) regulatory agencies, (7) financing agencies, (8) owners of the water utility (Article IV, Figure 2).

The role of customers and citizens in water services has largely been undervalued in developing countries. Yet, customers are the core group of stakeholders, and therefore, their needs and perceptions are most important and should be better addressed in the future. Customers' rights should be adequately protected either through water services legislation or other general legislation, especially competition and consumer protection legislation.

Service quality parameters

Water utilities must ensure that they have water resources available in the future, and also that an adequate quantity and quality of water can be supplied to the customers. A viable water system must also meet customers' needs and expectations in a consistent manner.

Water utilities should increasingly recognise customers' expectations and react to customers' perceptions on service quality. Better customer relations and effective operation of a water utility depend on the most central service quality parameters. Service quality is difficult to measure, but for instance the International Water Association (IWA) has developed and proposed performance indicators that include service quality parameters (Alegre et al, 2000). Experts found these IWA service quality indicators highly relevant. Another SERVQUAL model of perceived service quality suggests ten components for a customer's overall perception of service quality. Affordable and fair price of water to customers should be included in the service quality indicators.

From customer-orientation to customer-responsiveness

Since most water utilities in developing countries have not been very customer-oriented, they first need to learn how to recognise water users as customers instead of beneficiaries. Water utility services also have social, political, personal health, and economic dimensions, and therefore utilities need to maintain a dialogue with their customers and the public. The demand-responsive approach (DRA) is inextricably tied to institutional reform. The DRA requires more than just an active, empowered and organised community. It should be accompanied by institutional reform and organisational change at the micro-, meso- and macro levels.

In the future, provision and production of water services is likely to be increasingly based on the rights, values, ethics, responsibilities and expectations of all stakeholders. To fully recognise customers as the key stakeholders, they should be involved more in decision making, strategic management and ownership of utilities. The next development step from customer-oriented water and sanitation services should be customer-responsive, which adequately considers the fundamental values and ethics attached to the service as well as the value added from the customers' point of view.

Customer-management and ownership

Community participation has over the years evolved into community management of water systems. Effective operation of utilities and adequate willingness to pay for services requires that the customers perceive their ownership and responsibility of the water and sanitation services. Water cooperatives and other user-owned and -managed utilities, especially in rural areas, have indicated a high level of customer satisfaction and good operational performance. Yet, water cooperatives can be successful also in large urban settings, as demonstrated, for instance, by Saguapac in Bolivia. Smaller, user-managed utilities are likely to operate closer to the customer-responsive model than most urban public water utilities, and could thus provide useful lessons. Thus, it might be possible to combine the strengths of the customer-responsiveness of user-managed (small) systems and the more professional operations and management of larger public systems. In order to improve operations and (economic) performance, customer-orientation needs to be given more attention also by the urban water and sanitation utilities of developing countries.

In principle, municipal water utilities apply local democratic control to management and indirect customer-ownership, which should ensure a high level of customer-responsiveness. In developing countries this does not often happen due to various governance problems. On the other hand, privately owned or operated water utilities can often be more customer-responsive than public utilities, because the private sector depends so essentially on good customer relations.

In developing countries community ownership of utility assets may become even more important than mere community-management of systems. Community-management of large rural piped water systems with treatment and pumping is rarely successful in developing countries. Instead, communities should preferably own these systems and outsource management to professional operators.

Future customer-orientation strategies

It is concluded that water utilities both in developed and developing countries clearly need to improve their customer-orientation. This requires clear-cut customer strategies. Customer service standards are becoming more elaborate, especially concerning technology, competition and regulation. Information technology will facilitate many improvements in customer-orientation. Currently, even those countries and utilities that are forerunners in customer-orientation are still far from true customer-responsiveness. Water utilities have become more open in their public relations, but recently the risk of terrorism and other vulnerability concerns have emerged. Thus, water utilities may have to rethink their customer involvement and public information strategies due to security concerns.

Various tools and processes have also been developed to improve customers' accessibility to information about the utility's operations. Benchmarking, use of quality systems – such as ISO standards – and balanced scorecards seem to be the most prominent tools of the near future. Accreditation and other alternative approaches are becoming more common. Traditional customer relations tools – such as leaflets and customer newsletters and other publications – are still appropriate and should be increasingly used in developing countries. Information technology provides new avenues for customer-orientation through the Internet and other electronic tools. Water utilities should also tend to think about their “reputation management” in a more innovative manner.

4.2.5 Knowledge management and visionary management in water services (Article V)

Article V deals with the management practices of water services organisations and discusses the need and approaches to visionary and knowledge management. The results of the Delphi survey No. 8 and subsequent findings based on Article V are summarised in the following. This Delphi survey was carried out before the submission of Article V, and thus the findings of the article were not yet argumented by the Delphi participants.

Based on the discussion in Articles I and V, and in Chapters 3.3 and 3.5.2, it can be concluded that water utilities – especially policy level authorities – need a more systemic and holistic approach to water services management. The systemic approach is justified, for instance, by the following dimensions of water services:

- Complexity of the operational environment
- “Soft elements” (human activity, customer focus, public participation)
- Multi-disciplinarity arising from the “ontology” of water services.

Need for visionary management and long-term thinking

Water utilities and other water service organisations operate in a sector and environment which requires continuity and long-term perspective in operational and strategic management. Yet, most water utilities have traditionally not been very futures-oriented, and in practice not very interested in the ethical aspects of socially important decisions regarding water and sanitation services provision and production (Article V). Therefore, water utilities need proactive visionary management to better conceptualise their future operational environment.

Need for knowledge management

Water utilities and other water service organisations need, and have, a lot of information and knowledge to perform their operations, but often this information is not fully utilised due to the tacit nature of the knowledge and inadequate information and knowledge management systems. Utilities need knowledge management to improve their performance through better management of critical information and knowledge resources, which form their human intellectual capital – including tacit knowledge. Knowledge management also provides a long-term approach to utility management. It allows utilities to leverage their most precious assets, collective know-how, talent and experience.

Current use of management practices

Based on the results of Delphi survey No. 8, it seems that water utilities are not very well aware of the theories and principles of various management and leadership styles (Chapter 3.5.1). Management styles or practices which the participating utilities and experts have mainly utilised are shown in Figure 4.2. Other rarely applied practices include management by opportunities (MBO) and mental management (MM).

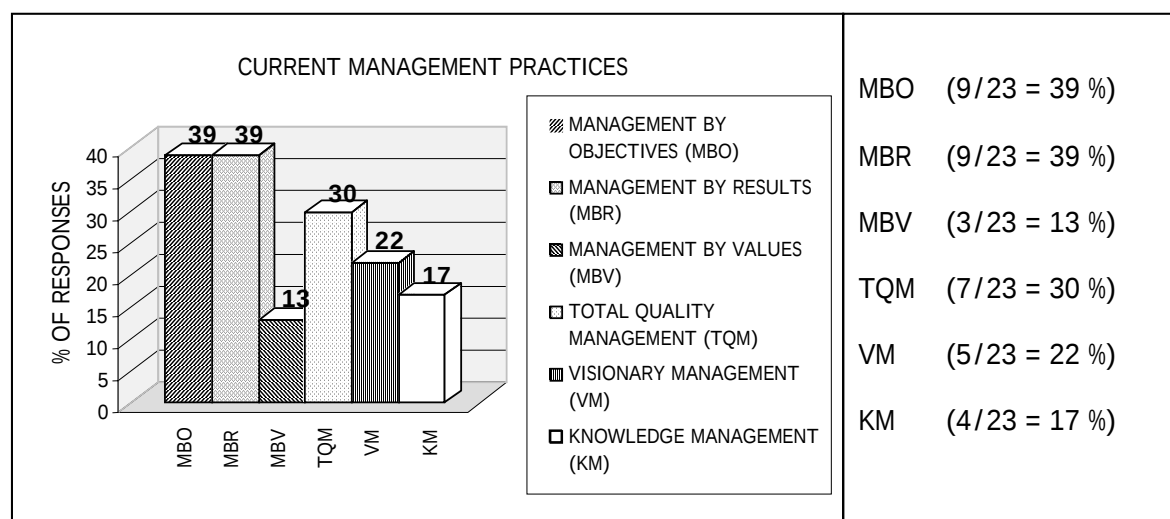


Figure 4.2 Current management practices of water utilities.

Application of visionary management tools

Water utilities have most commonly used visionary management tools for the purposes shown in Figure 4.3. Here, strategic decision making includes areas ranging from corporate strategic direction to business improvement, R&D, and operations.

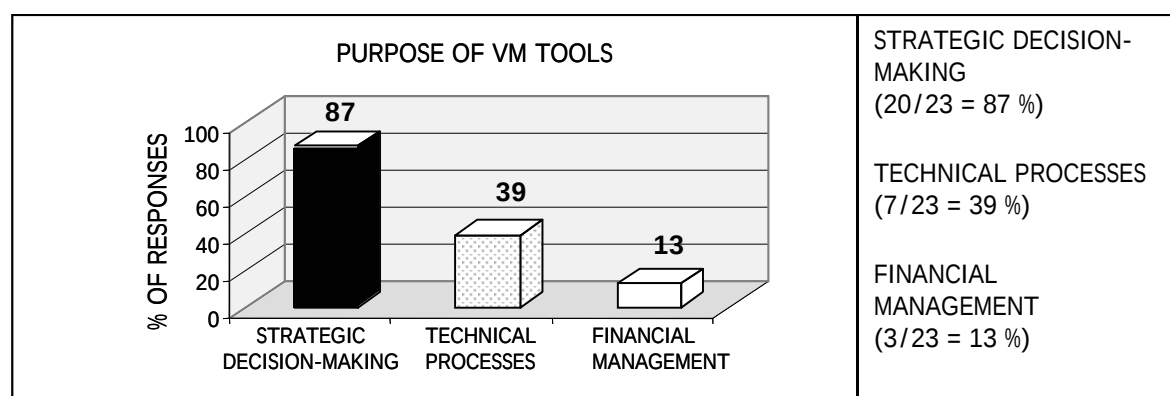


Figure 4.3 Purpose of VM tools by water utilities.

Water utilities have used the concepts of visionary management shown in Figure 4.4.

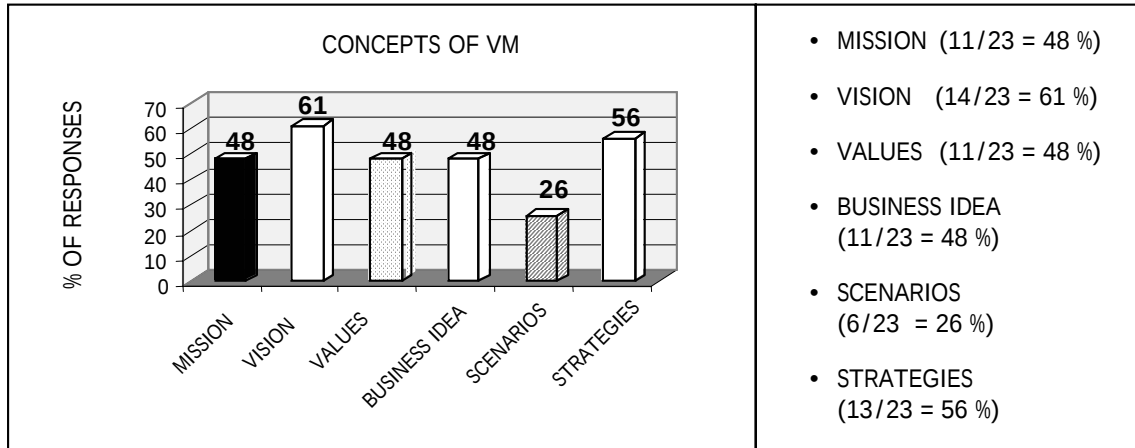


Figure 4.4 Concepts of VM used by water utilities.

Water utilities have used the visionary management tools shown in Figure 4.5.

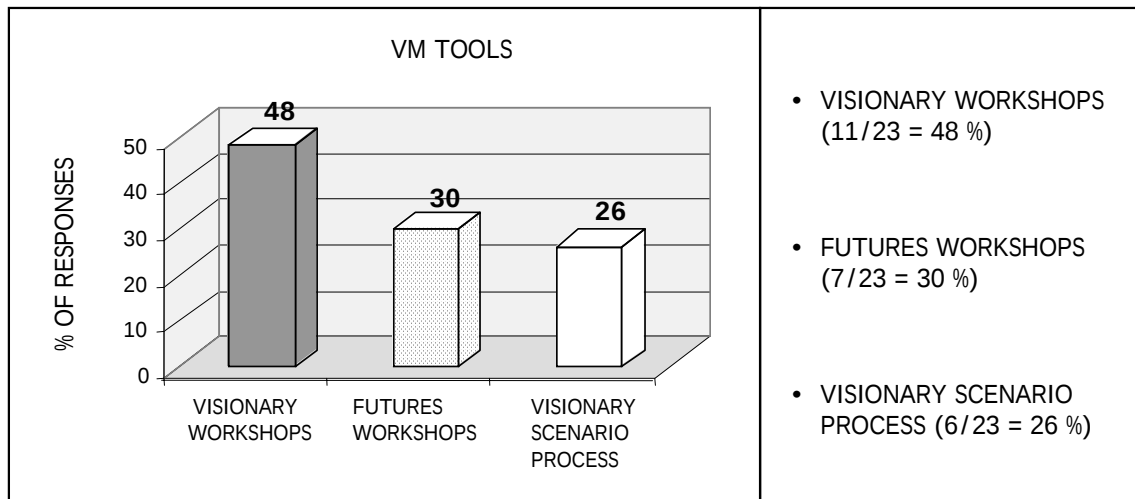


Figure 4.5 Use of VM tools by water utilities.

Water utilities have used the futures research tools shown in Figure 4.6.

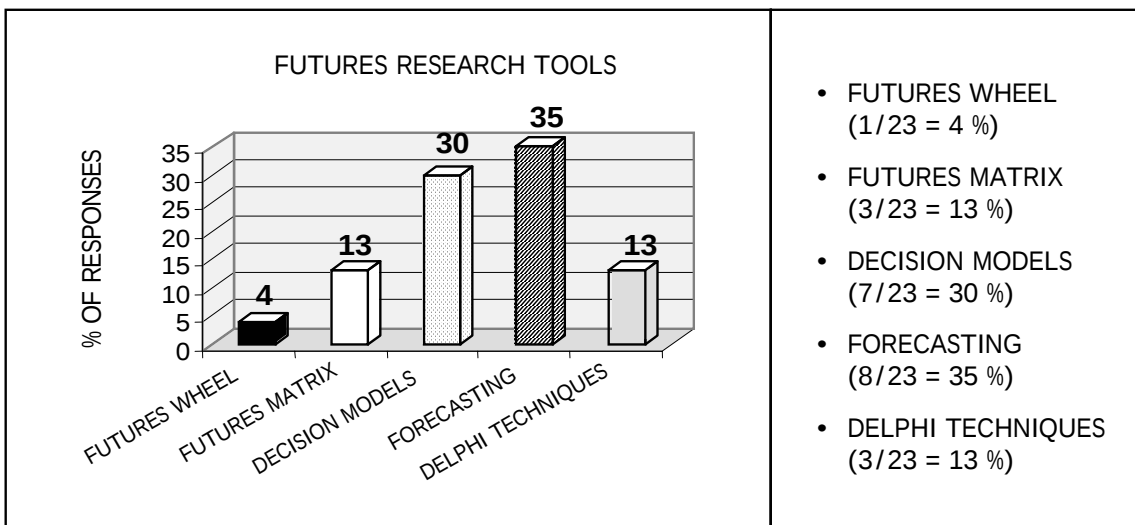


Figure 4.6 Use of futures research tools by water utilities.

Application of other strategic management tools and concepts

Water utilities have used the strategic management tools shown in Figure 4.7 in their operations. Other rarely used strategic management tools applied in the water services sector include: TOC, ADIZES, PESTE analysis, various specific tools such as the personnel programme UCan, development of and adherence to corporate performance contracts.

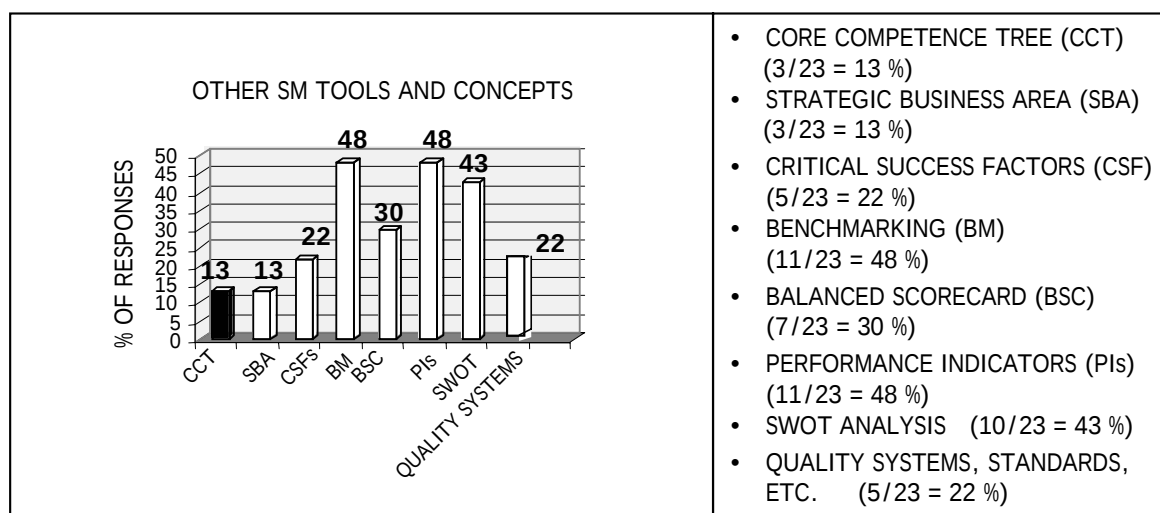


Figure 4.7 Use of other SM tools and concepts by water utilities.

Application of knowledge management tools

Water utilities have used the explicit knowledge management tools shown in Figure 4.8. None of the respondents had used artificial intelligence, cyber systems, or screen-based analyses.

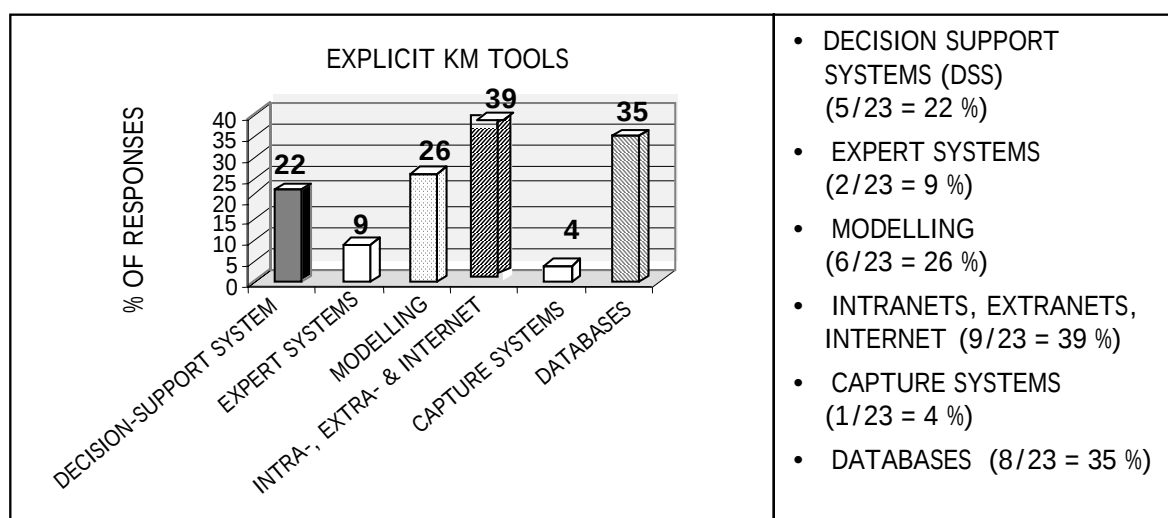


Figure 4.8 Use of explicit KM tools by water utilities.

Water utilities have used the implicit knowledge management tools shown in Figure 4.9. Other knowledge management tools used include various system combinations, and other uses of IT possibilities.

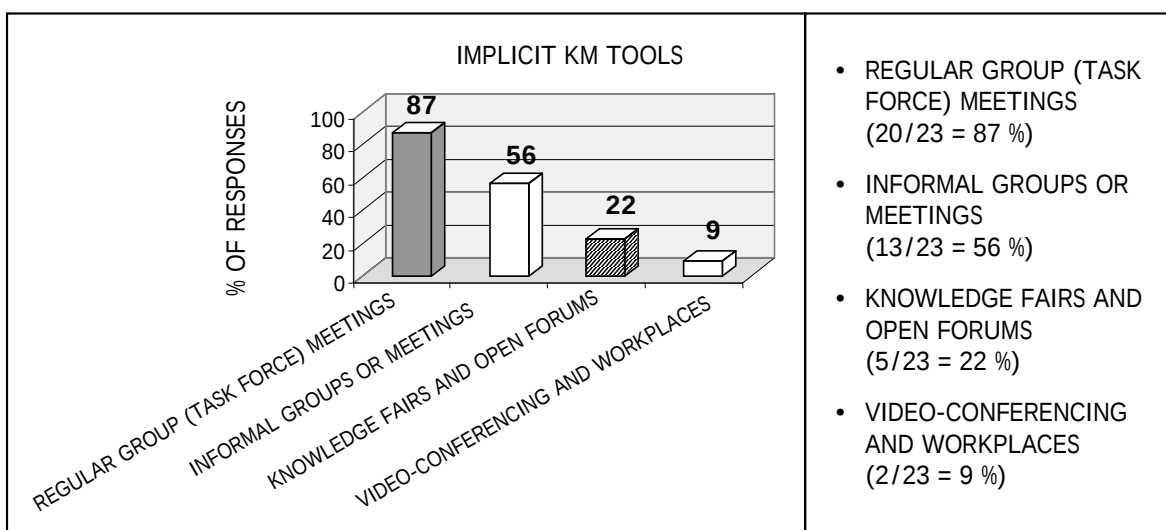


Figure 4.9 Use of implicit KM tools by water utilities.

Water utilities have most commonly used knowledge management tools for the dimensions of management shown in Figure 4.10.

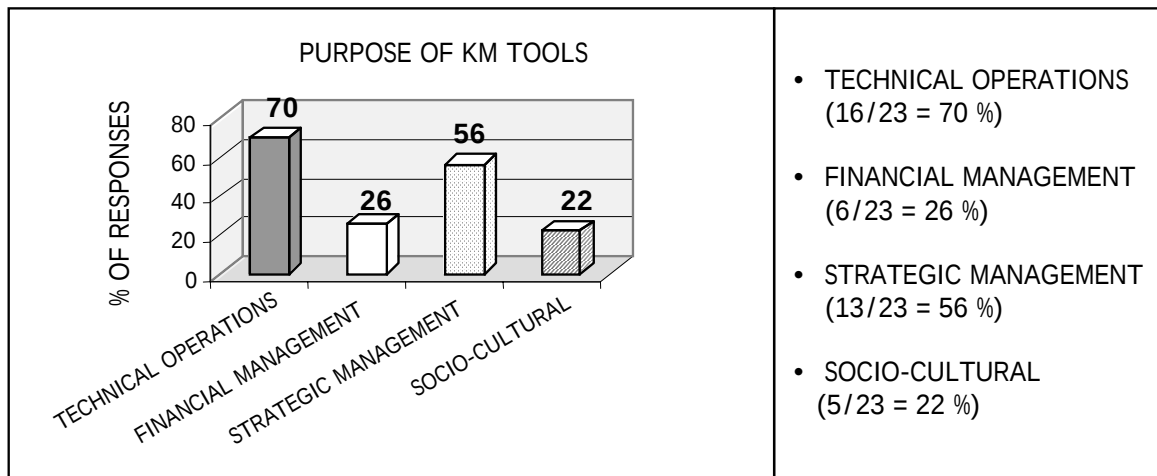


Figure 4.10 Purpose of KM tools by water utilities.

Participation in professional networks

An important part of knowledge management is the sharing of information through professional and personal networks. Utility managers and staff are in general actively involved in such networks both at a national and international level. The most common and prominent international professional networks with which utility managers are affiliated include IWA, EUREAU, AWWA, EWA, and GWP.

Innovations

Some of the most important innovations (technical, operational, managerial, or strategic) that utilities have developed or taken into use with an aim to improving their performance include:

- Lap-top network maps for all operational personnel
- Research on important parameters for making decisions on planning of rehabilitation measures
- Research on on-line information to raise the safety of drinking water production and distribution
- Novel process control systems at wastewater treatment plants
- GIS applications and modelling in water and wastewater network management
- Causal relationship mapping, matrix evaluation, neuro-linguistic programming (NLP) based visionary methodology
- Sharing knowledge as personal competence
- Value management strategic partnerships, strategic thinking system
- Business process re-engineering (BPR), introduction of integral management
- New developments in drinking water treatment processes
- Strategic dialogue, EFQM excellence model.

The main obstacles suppressing innovations include: lack of time, money and other resources, strong professional culture, lack of innovation supporting mechanisms, poor motivation of employees and staff resistance to change, cultural aspects, low public (governmental) spending on research, absence of competition which eliminates the sense of urgency of change.

Future needs and demand for VM and KM

Respondents saw the need (demand) for applying these visionary and/or knowledge management procedures in their organisation in the future in a variety of ways. Some foresaw very little need for visionary management but a continued need for knowledge management. Some saw that VM is needed to generate ambition and KM is needed to keep up with technological development and HRM. In any case, water utilities operate in an ever changing and dynamic environment with an increasing number of competitive drivers, and therefore both VM and KM systems are essential and need to be applied in proportion to improvements in management capacity of the utility. They are an essential part of doing business as they are tools that ensure sustainability. However, it is also important to develop management systems that provide added value to the practical and effective operations of the utility.

For instance, in Kenya the water services sector is currently undergoing its biggest reform in decades. A reform is truly needed, because the performance of most public water utilities has been poor in the past. As indicated in Article V, even the best performing water utilities in Kenya do not utilise visionary management tools at all. Essential performance standards and indicators for comprehensive monitoring of performance are also lacking from most Kenyan water utilities.

5 WATER SERVICES REFORM – THE CASE OF KENYA

5.1 Background and objectives

As briefly described in Chapter 2.1, the present situation with water and sanitation services in Kenya is far from satisfactory. Service coverage and service level are inadequate both in urban and rural areas (Table 5.2). The performance of existing water supply systems is poor, due to the constraints discussed in Articles I and III and Chapters 2.1 and 5.2.3.

Since 1981 Kenya has been an important partner of Finland's water sector development co-operation. The author and other members of the CADWES research team at Tampere University of Technology (TUT) have participated in several research and project assignments dealing with Kenya's water sector development since the late 1980s. This dissertation is a logical continuation of earlier research projects (Hukka, Katko and Seppälä, 1992; Hukka, 1998).

Recently, Kenya has set challenging new development targets to improve water and sanitation services (NWSS, 2003; Republic of Kenya, 2002e). The water sector reform process is a major effort launched to reorganise the sector in order to achieve the development targets. Therefore, Kenya was considered as an excellent case study for analysing the policy and reform process.

The objective of this case study was to provide a visionary management approach for Kenya's water services sector development. Futures research methodologies were applied to assess the alternative futures for Kenya's water services and to analyse the ongoing sector reform process itself.

Figure 5.1 shows the location of Kenya and some basic facts. Kenya is a typical African developing country with a low economic growth, high population growth and urbanisation, and an increasing scarcity of freshwater resources.

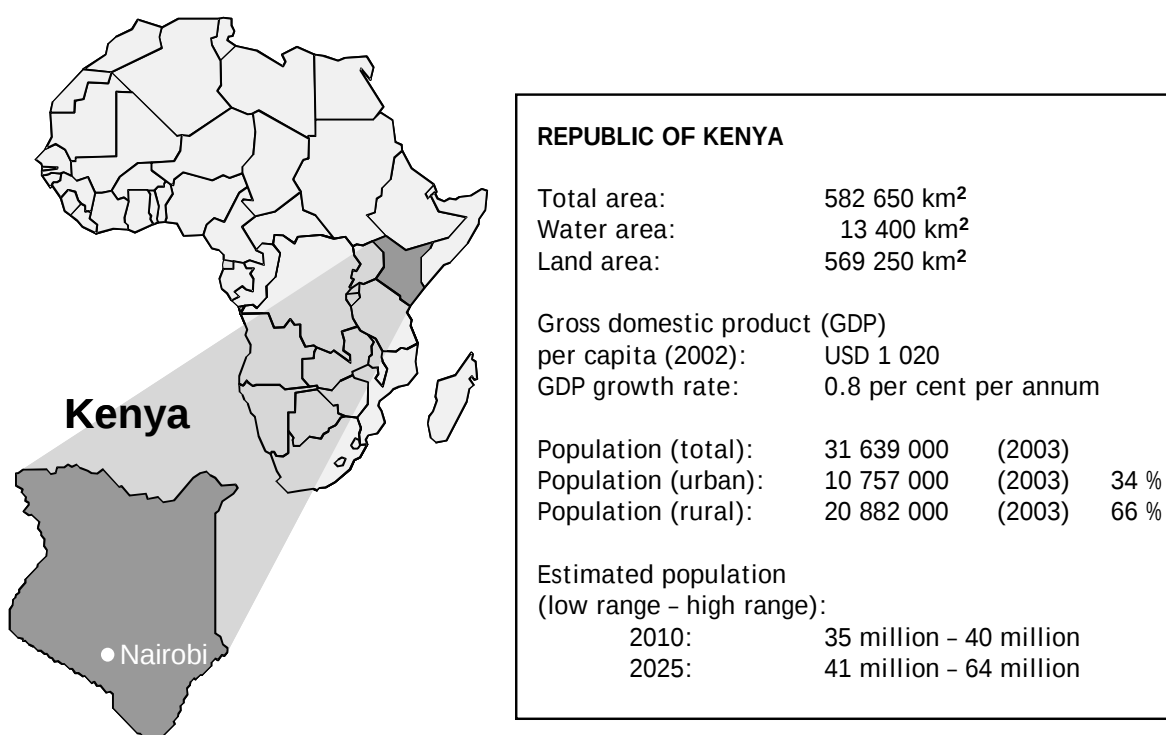


Figure 5.1 Location and some basic facts of Kenya.

5.1.1 Introduction of case study analysis

A case study analysis on the planned and ongoing water sector reform process in Kenya was implemented based on a visionary working process. The soft systems methodology (SSM) and scenario techniques were used in the visionary process.

The case study analysis was based on:

- 1) The present situation of water services management and its institutional framework in Kenya (Chapter 5.2), including (a) problem analysis (Chapter 5.2.3), and (b) core definition and system description (Chapter 5.2.4).
- 2) Futures assessment of the water services reform in Kenya (Chapter 5.3), including (a) a general description of the planned reform process (Chapter 5.3.1), (b) alternative scenarios for the future of water services in Kenya (Chapter 5.3.2 and 5.3.3), and (c) definition of core vision and system description for the future situation (Chapter 5.3.4).
- 3) Comparison of the present system description (institutional framework) and the reformed futures model for institutional frameworks (Chapter 5.3.5).
- 4) Analysis of the implementation of the reform process, with a view to assessing problems with the present reform action plan (Chapter 5.4).

The findings and results of Delphi testing of issues related to policy and institutional reform implementation (Chapter 4.2.1), and field studies in Kenya were utilised in the analysis. While concentrating on the reform process in Kenya, comparisons and lessons learned from other countries were also utilised – including Finland, Kosovo, South Africa, Uganda, and Zanzibar (Chapter 5.4.3).

The SSM process applied to Kenyan water services reform analysis is presented in Figure 5.2. The SSM process was based partly on a participatory visionary workshop in Kenya (9th May, 2003) and partly on the author's consequent working process based on the findings of the workshop.

Policy and reform implementation involves different types of action at various levels, as shown in Figure 5.3, applied to the policy reform and administrative structure of Kenya.

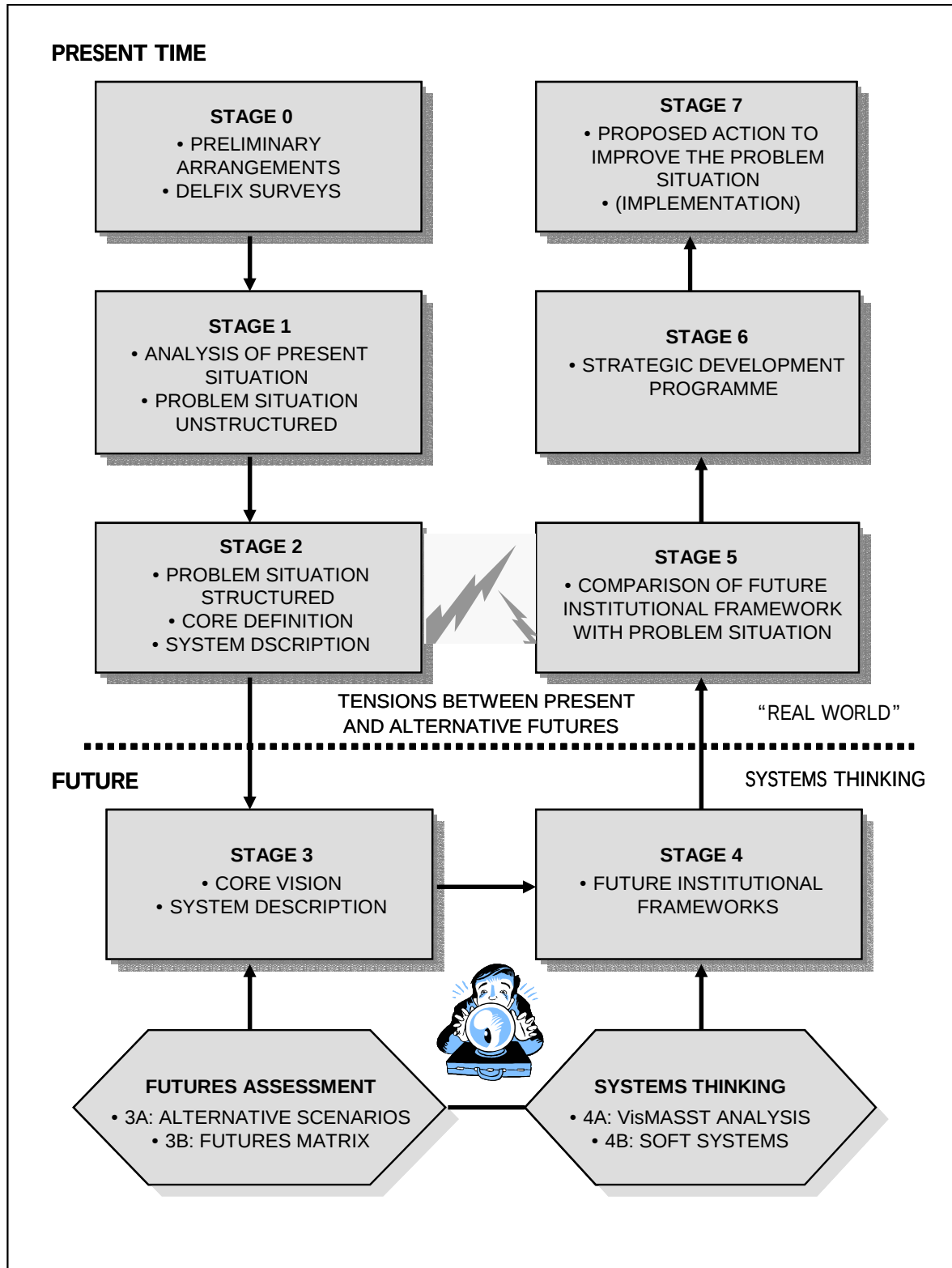


Figure 5.2 Stages of the scenario working process on Kenya's water sector reform (modified from Hovi and Kaivo-oja, 1996; Mannermaa, 2003a).

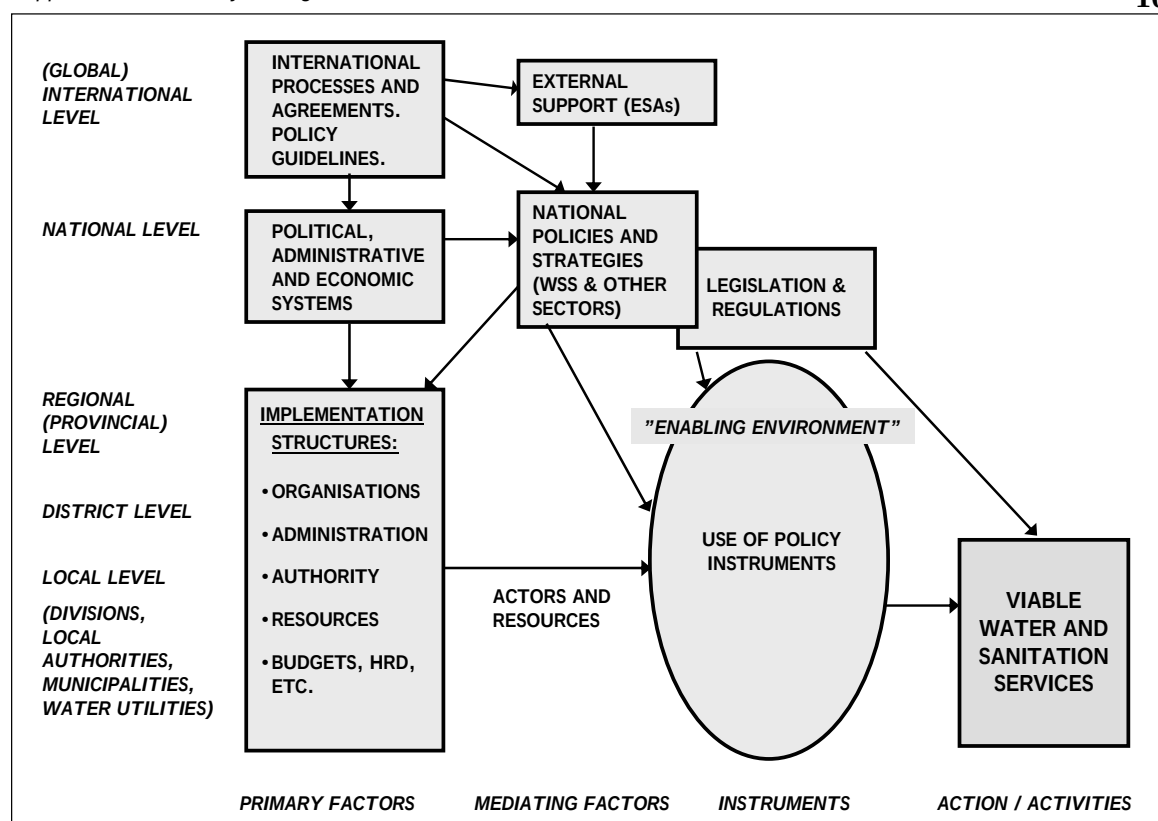


Figure 5.3 The various levels, factors and activities of water and sanitation policy implementation in Kenya (modified from Onjala, 2002a).

5.1.2 Development stages of the water and sanitation sector in Kenya

The main development stages of the water and sanitation in Kenya since independence in 1963 to the present are described in Table 5.1. A more detailed analysis of the development stages with their linkage to major political and economic policy trends is presented in Appendix 1. The main sector development trends in Kenya (Table 5.1; Appendix 1) seem to follow roughly the major international evolution trends of water sector development policies and strategies (Article I; Chapter 4.2.1).

Table 5.1 Main development stages of water and sanitation development in Kenya.

Period	Descriptive trend	Objectives ("ideal")	Implications ("real life")
1960s – mid 1970s	Social services and poverty alleviation.	Free basic water and sanitation services by the government.	Unrealistic targets: coverage remained low.
mid 1970s – early 1980s	Supply-driven approach & Self-help initiatives.	Self-help initiatives ensuring community participation.	Many self-help schemes were taken over by the government
early 1980s – mid 1990s	Decentralisation and commercialisation.	Local authorities and NWCP got increasing responsibilities.	De-concentration instead of decentralisation.
mid 1990s – Present	Towards a more decentralised and delegating policy.	Community water supply. Emerging policy: delineation and clarification of roles.	Declining government resources triggered policy changes.
Present – Future	Policy and reform implementation. Private sector participation.	Delegation. Re-regulation. IWRM. Resource mobilisation. Capacity building. Sanitation concerns.	Water Act 2002. NWSS & NWRMS 2003. Impacts of reform are still to be seen.

5.2 Present situation of water services management in Kenya

5.2.1 Water and sanitation service coverage in Kenya

Despite several developments and changes in policies and institutional arrangements, water and sanitation services in Kenya remain unsatisfactory. Table 5.2 shows the development of service coverage from the 1970s to present, both the average for Kenya and for the Western Province. Service coverage is still very low, and overall coverage has been declining in terms of quality and quantity, reliability and type of access. The level and quality of service for those who are covered is inadequate. Operational status and viability of the existing systems is poor. The poor overall situation with water and sanitation services in Kenya can be attributed to a large number of reasons. Problems and factors contributing to the poor overall performance of water utilities were described in Chapter 2 and 5.2.3. Kenya's water and sanitation service coverage figures are not all that clear, although several estimates have been published (NWSS, 2003; Republic of Kenya, 2002e; WHO and UNICEF, 2000; World Bank, 2000).

Table 5.2 *Water supply and sanitation service coverage (%) in Kenya (Aide Memoire, 2000; CWSMP, 2003; KFWWSP, 1996; NWSS, 2003; Republic of Kenya, 2002e; WHO and UNICEF, 2000; World Bank, 2000).*

Service coverage	Early 1980s	Early 1990s	2000	2003
Water supply, average				
• Kenya	22-27	45-49	49	55-60
• Western Province	about 30	43-55	60	about 60
Water supply, urban				
• Kenya	50-75	89	87	70-75
Water supply, rural				
• Kenya	12-17	25	31	48-50
Sanitation, average				
• Kenya	40-45	80-84	65-86	48-50
Sanitation, urban				
• Kenya	50-60	94	70-96	65
Sanitation, rural				
• Kenya	25-35	84	65-86	40

In the Western Province, the long-term presence of Finnish development assistance from 1981 to 2003 has had a significant impact on water and sanitation service coverage and performance (Table 5.2), although the sustainable impacts on service coverage and service quality remain uncertain (CWSMP, 2003).

5.2.2 Present institutional framework for water services management

The present main actors, that is, organisations operating and managing water systems in Kenya, include the Ministry of Water Resources Management and Development (MWRMD) (formerly Ministry of Environment and Natural Resources, MENR), the National Water Conservation and Pipeline Corporation (NWCP), the Ministry of Local Government (MOLG) and local authorities (LAs), and various community-based organisations (CBOs). Other actors include river basin authorities, communities, various institutes and NGOs which operate and maintain their own water supply systems. Local authorities provide sewerage services in municipalities and urban areas.

Some water sector actors are mainly concerned with policies, others with implementation, operation and maintenance while some have multiple roles, which has led to contradictions in the sector. Other actors indirectly involved in the water sector include the Ministry of Agriculture (MOA), the Ministry of Health (MOH), the Kerio Valley Development Authority (KVDA), the Tana River Development Authority (TARDA), the Lake Basin Development Authority (LBDA), the Kenya Wildlife Service (KWS), various non-governmental organisations (NGOs), self-help and community groups, as well as private companies.

At present there are over 1500 water supply systems in Kenya managed by various agencies. The MWRMD runs over 600 rural water supplies of which 200 systems are gazetted for revenue collection. The NWCP runs over 48 water supplies, 45 of which are gazetted. Communities together with self-help groups and NGOs run more than 865 systems and LAs run eight systems (Table 5.3). These systems supply water services to a total of about 18.6 million people, which meant average service coverage of 59 per cent of the total population of 31.6 million people in 2003.

Table 5.3 *Number of water supply systems in Kenya by service provider and population served (Aide Memoire, 2000; NWSS, 2003).*

Service provider/producer	No.	Pop. served (millions)
Ministry of Water Resources Management and Development	628	6.1
National Water Conservation and Pipeline Corporation	48	3.7
Communities	356	} 4.9
Non-governmental organisations	266	
Self-help water supply systems	243	
Local authorities	8	3.9
Total	1 549	18.6

When the new multi-party coalition government (NARC) came into power in Kenya in January 2003, the former Ministry of Environment and Natural Resources (MENR) was replaced by the new Ministry of Water Resources Management and Development (MWRMD).

Figure 5.4 describes the present institutional framework for water services management in Kenya. The Ministry of Water Resources Management and Development (MWRMD) has major responsibility for (1) water policy development, (2) water resources management, and (3) water services provision.

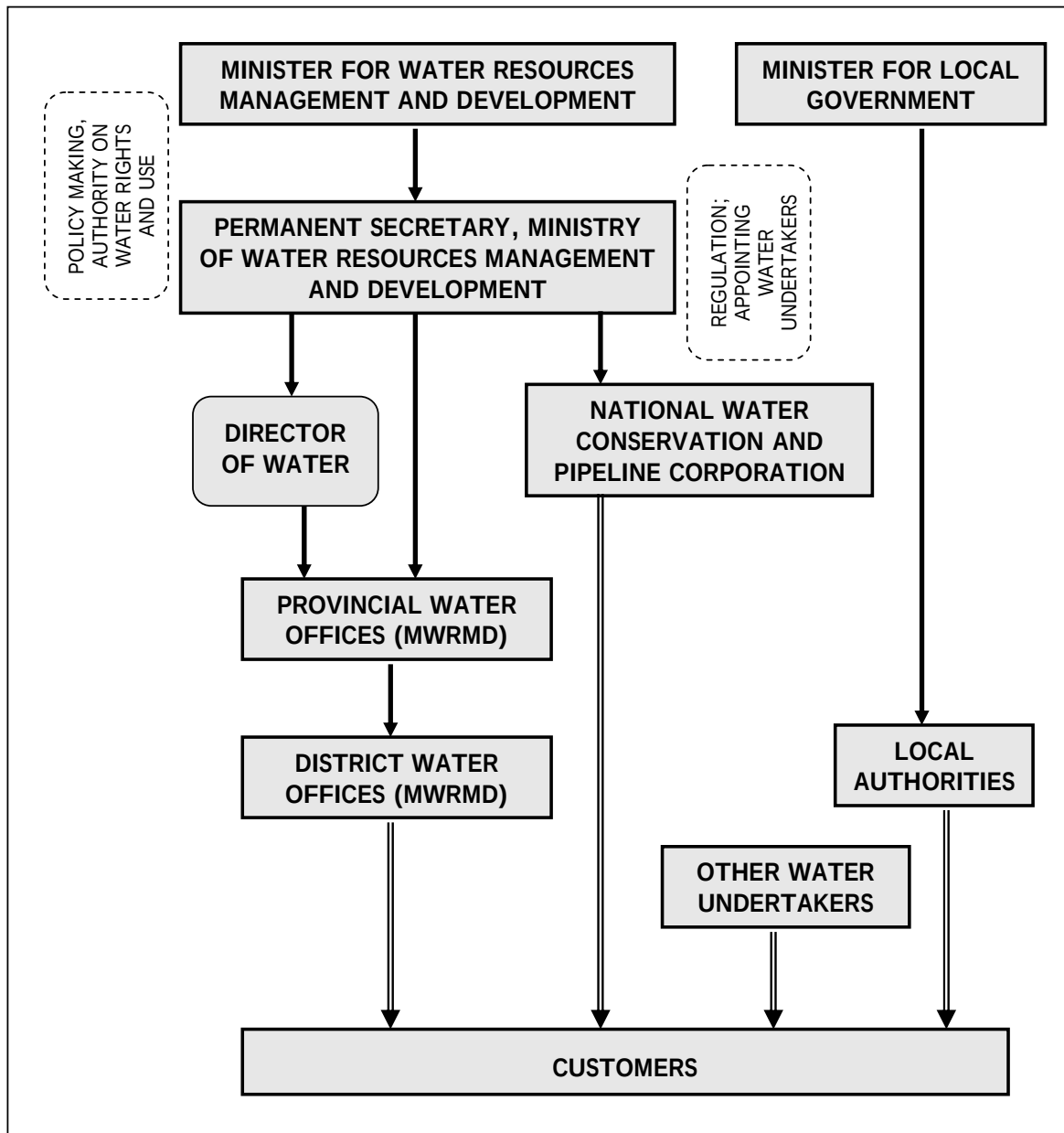


Figure 5.4 Present institutional framework for water services management in Kenya.

The present key roles and functions of the MWRMD have been defined as (NWSS, 2003; Republic of Kenya, 2002a):

- Water policy formulation
- Water resources management policy
- Apportionment of water resources and abstraction licensing
- Appointment of water undertakers
- Regulation, setting and approval of standards
- Approval of water tariffs, levies, rates and charges
- Development and O&M of urban and rural water supply systems

- Waste water treatment and control
- Water quality and pollution control
- Catchment area conservation
- Water conservation (by National Water Conservation and Pipeline Corporation)
- Irrigation and dam construction schemes
- Flood control and land reclamation.

Other policy level water and sanitation sector-related functions are the responsibilities of the following ministries:

- Environmental policy: the Ministry of Environment, Natural Resources and Wildlife
- Environmental impact assessment and co-ordination: the Ministry of Environment, Natural Resources and Wildlife
- Overall sanitary services: the Ministry of Health
- Local authorities' policies: the Ministry of Local Government.

Figures 5.5 to 5.7 show the present organisation charts of the key public agencies in water services management: the Ministry of Water Resources Management and Development (MWRMD), the National Water Conservation and Pipeline Corporation (NWPC), and the Ministry of Local Government (MOLG) through local authorities (LAs). However, it should be noted that these organisational structures are in a process of change due to the new Water Act (Republic of Kenya 2002a) and the water sector reform described in Chapter 5.3.1.

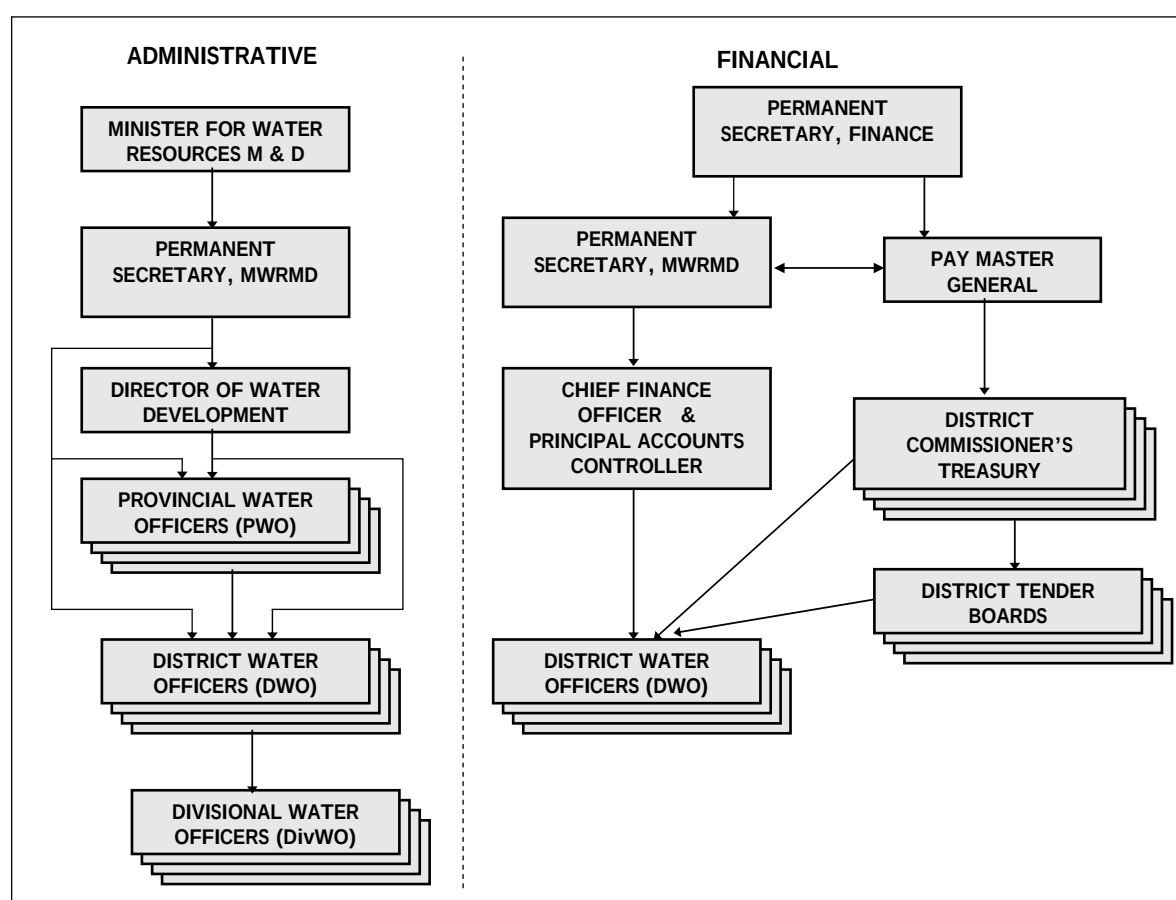


Figure 5.5 Present organisation of the Ministry of Water Resources Management and Development (MWRMD), Kenya (administrative and financial).

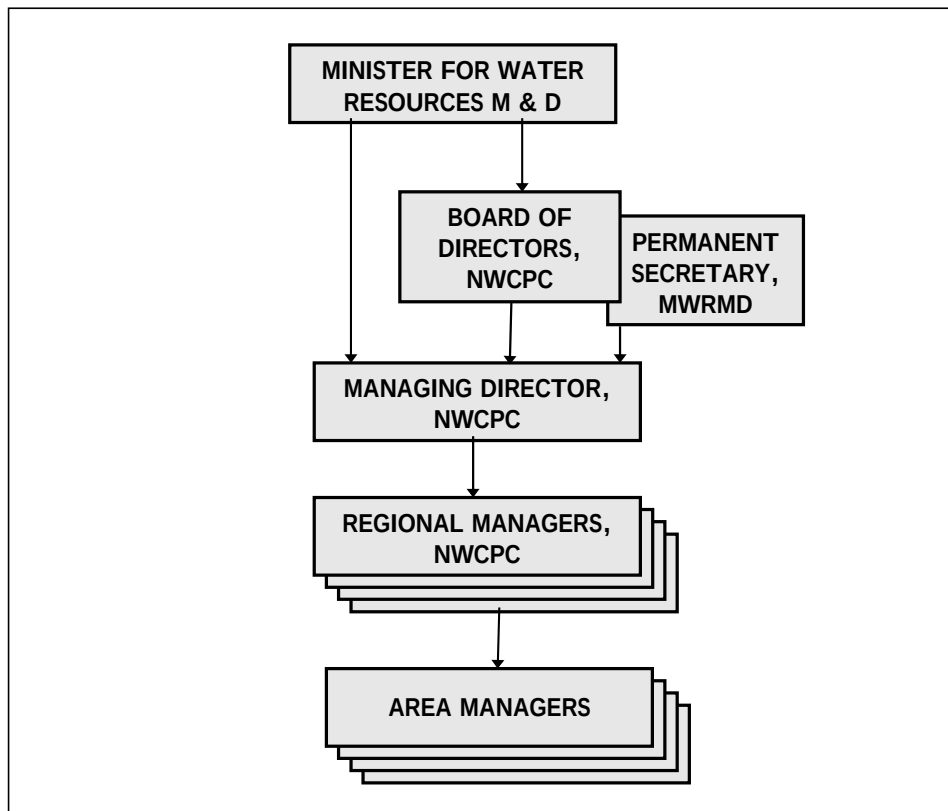


Figure 5.6 Present organisation of the National Water Conservation and Pipeline Corporation (NWPC), Kenya.

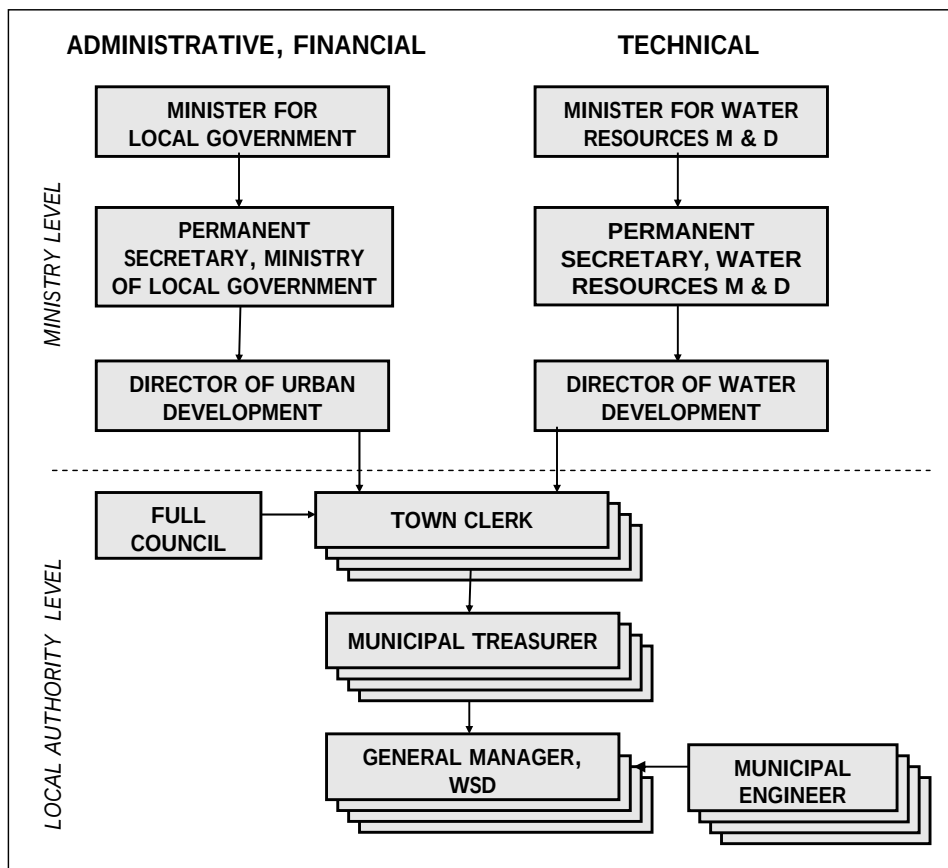


Figure 5.7 Present organisation of local authorities in Kenya (administrative, financial, and technical).

5.2.3 Problem analysis of the present situation

An *unstructured* problem definition of the Kenyan water services sector was presented in Chapter 2.1 and 5.1. To establish a more *structured* definition of the problem situation, the key problems are further categorised according to the following main issues:

- i) *Scarcity of water resources and their inadequate protection*
- ii) *Limited financial resources and inadequate water sector financing*
- iii) *Inadequate availability of skilled human resources / staff / personnel*
- iv) *Inappropriate institutional arrangements and frameworks, including legislation*
- v) *Inappropriate and poorly functioning water sector organisations.*

These five key problem areas are described below in more detail.

i) Water resources and their protection

According to water resources assessments, Kenya's water resources will be at a critical stage of scarcity already by 2010 (NWRMS, 2003; WHO and UNICEF, 2000). Kenya's population is estimated to increase to 37 million by 2010 and to 45 million by 2025 – according to the highest estimates even to 64 million. Total water demand in 2010 will be about 4.18 million m³/d and about 8.20 million m³/d in 2025 according to the highest estimates. This means that the available water resources per capita will drop from the present 647 m³/cap,a to about 520 m³/cap,a in 2010 and to about 235 m³/cap,a in 2025 (NWRMS, 2003). These figures already indicate a serious water scarcity. According to the water poverty index (WPI), Kenya ranks number 117 among the 147 countries included in the study (Lawrence, Meigh and Sullivan, 2003). Kenya's combined WPI based on the five key components (resources, access, capacity, use and environment) is 47.3, while values from 35 to 47.9 are considered severe.

Inadequate demand management has further aggravated the problem. Inadequate attention has been paid to (1) persistently high quantities of unaccounted-for water in distribution systems, (2) frequent leakages that are rarely attended to, (3) old pipelines, old leaking pumping plants and equipment, (4) poor main and distribution pipe network designs, (5) illegal connections and water theft, and (6) water tariffs that do not encourage customers to use water efficiently (NWSS, 2003).

In terms of water quality, Kenya's water resources face serious threats from pollution, siltation, reclamation, pesticides, weed attack, and human population activities (IEA, 2001; Republic of Kenya, 1997). Wastewater treatment is still very limited in Kenya's urban centres (NWSS, 2003; Republic of Kenya, 1997). Very few water intakes have any kind of protection plan.

ii) Availability of financial resources and water sector financing

The present levels of funding for the water sector are much lower in real terms than in the 1970s and 1980s (Hukka et al, 1992; NWSS, 2003). Inadequate government funding has been one of the major forces driving the policy reform. Donor funding has decreased and it is not realistic to rely on increasing donor financing in the future. Domestic water sector funding has been inadequate due to low revenues and too low tariffs, which are primarily pricing policy constraints (Article III). However, low capital investment into the water sector, poor O&M of existing systems, high volume of unaccounted-for water (UFW), and poor financial management practices have for their part undermined cost recovery

objectives. It has been estimated that about USD 350 million would be needed over a 10 year period to finance the required water supply investments in Kenya, while the actual development and recurrent budgets have amounted to hardly 50 per cent of this (Article III). On the other hand, private investments into the water sector in Kenya have so far been modest (UNCHS, 1998).

iii) Human resources in the water services sector

Despite its large number of public sector employees, Kenya has had a lack of educated and qualified professional staff in the water services sector. It has been estimated that in 2000 there were about 1600 civil engineers in Kenya and the ratio of civil engineers to total population was about 1:19500. This ratio is very low compared to any developed country: for instance in Finland the ratio is approximately 1:1310 (Hukka and Mbwette, 2000). Training of engineers and other professional staff for managerial positions in the water sector in Kenya has in the past been negligible. Most higher level professionals were trained abroad. Water utilities and the MWRMD and NWCPC have rather competent technical staff in larger cities, mainly trained at the Kenya Water Institute (KEWI). On the other hand, especially financial managers are often incompetent. Smaller towns, districts and rural areas lack trained professionals, and water management is often the responsibility of non-trained staff. In 2003 the MWRMD employed about 7200, the NWCPC about 1400, and local authorities and their autonomous WSS companies about 3700 people. The average staffing ratio is 12.2 staff per thousand connections, which is high compared to an average of 8 staff / 1000 connections in other African countries while the best operate with less than 4 staff / 1000 connections.

iv) Institutional arrangements and frameworks

The institutional arrangements of most sectors in Kenya are centralised and bureaucratic. Some of the main causes for the poor performance of the water services sector in Kenya have been attributed to the following institutional constraints (NWSS, 2003; Nyangeri, 2002; Onjala, 2002a,b):

- Institutional weaknesses and poor decision making and implementation mechanism caused by (1) limited national economic growth, (2) poor organisational structures, (3) centralised management, (4) excessive political influence and interference, (5) uncertain and inconsistent policy regime and regulatory framework, (6) lack of autonomy and clear definition of roles, which leads to conflicts. Especially the present role of the Ministry in charge of water (MWRMD) as the primary service provider and principal regulator has constrained sector development and performance.
- Poor co-ordination between the fragmented water sector institutions and organisations, leading to wastage of scarce resources and duplication of efforts. It is common that resources allocated to water services improvements are actually used for other unrelated activities.

Policy. The lack of a water policy was in principle remedied when the new National Policy on Water Resources Management and Development was launched (Republic of Kenya, 1999a). This does not mean that the present policy is appropriate, comprehensive and consistent in all its intentions and proposed actions (Chapters 5.3 and 5.4). As elaborated in Chapter 5.4.2, the new water legislation and reform plans may also to some extent contradict the policy intentions.

Legislation. Water sector legislation in Kenya has been fragmented and outdated, but has recently been partly amended. The previous Water Act Cap 372 (Republic of Kenya, 1972) – dating originally back to 1952, but amended in 1962 and 1972 – was substantially revised and amended in 2002. The new Water Act 2002 (Republic of Kenya, 2002a) still has its weaknesses – which are described in Chapter 5.4.2 – but a bigger problem than inadequate legislation and regulations is poor enforcement and compliance. At the water utility level, there is no appropriate performance monitoring system in use, and appropriate standards and performance indicators have not been applied. The Local Government Act (Cap 265) (Republic of Kenya, 1986) has been another important act affecting water and sewerage services. The Environmental Management and Co-ordination Act (Republic of Kenya, 1999b) deals with water resources protection and wastewater disposal. However, there is no specific legislation dealing with environmental sanitation issues.

Administration. In reality, Kenya's administrative system is highly centralised and de-concentrated rather than devolved or decentralised, thus providing a high degree of central control over the local level (Table 5.1; Peters, 1996). The water and sanitation services sector was centralised until the 1980s. The decentralisation policy called "District Focus for Rural Development" aimed at devolving decision-making power to the districts to avoid the delays that occur when decisions are made centrally at the national level.

Due to several reasons, this objective has not been fulfilled. Most of the provincial and district level authorities are actually only "extension arms" of the central government and do not have much decision-making power themselves. Also the District Focus system does not provide much participation. The local authorities system curtails democratic procedures through legislation and additional regulations (Peters, 1996). However, in the water sector the District Focus policy was intended as a major shift from centrally managed services to district-operated services.

v) Water sector organisations

Most of the public agencies involved in water services management in Kenya – the ministry in charge of water (presently MWRMD), the National Water Conservation and Pipeline Corporation (NWCP), and the local authorities – are highly centralised and bureaucratic and their organisational arrangements and culture provide little incentive to maintain facilities (Chapter 5.2.2). The low accountability of most water undertakers, the inadequate incentive system resulting from heavy centralisation, and the absence of accountability and transparency in financial management contribute to non-viable investments, unsustainable operations and poor service delivery.

Water sector organisations also suffer from poor staff discipline and work ethics, overstaffing by non-professionals and inappropriate deployment of staff. As a consequence, their capacity to manage, operate and maintain water utilities effectively and according to commercial operational principles is inadequate. In general, the level of innovations and technological development is low, which keeps the water systems and their management in a stagnant state and unable to cope with increasing future challenges. This is further aggravated by the inadequate skills, logistics, practices and standards that make it difficult to improve the poor situation with operations and maintenance of the existing water systems. The cost recovery of most water service organisations is too low to provide enough funds to operate the systems. Most of the water service organisations have been rather supply-driven and have not yet adopted the customer-oriented approach. Therefore, service levels have not adapted to customer needs either.

Local authorities (LAs). Kenya's local administration consists of four different types of councils: (1) 35 municipal councils providing a wide range of services, (2) 35 town councils responsible for basic services, (3) 56 county councils responsible for basic services, and (4) 23 urban councils providing only a few services (Peters, 1996). Local authorities (city, town and municipal councils) were charged with responsibilities for water and sewerage provision in the mid-1980s and started receiving substantial support from the German government.

Despite the good intentions and extensive financial support, local authorities have in general not been able to provide water and sewerage services successfully. One major reason is that all public water systems in Kenya – including those run by the local authorities – have had inadequate autonomy, especially regarding financial and revenue management. Another reason is that local authorities (LAs) have in general been poor and inefficient in their operations due to several factors. LAs are actually subordinated to the district administration and are required to submit all their development project proposals first to the District Development Committee (DDC) for district-wide co-ordination before they can even forward them to the Ministry of Local Government (MOLG). LAs also cannot adopt any by-laws that would be a prerequisite for adjusting any fees, charges or taxes without the approval of the Attorney General (AG).

LAs have had too many service responsibilities, and due to an inadequate tax collection basis and inadequate financial autonomy have not been able to manage most of their service obligations satisfactorily (Peters, 1996). LA personnel are not appointed on a merit basis but on a political basis. Yet, the incorporation of urban water utilities alone has not so far been able to adequately address the institutional weaknesses that lead to poor performance.

Local authorities (LAs) and other public sector organisations in Kenya face serious financial problems for a number of reasons (Devas, 2002; Smoke, 2000). As a result, many LAs have substantial deficits – in reality, even if not shown in the approved budget. Expenditure management is often simply crisis management. Many of these problems are caused by the structural imbalance between expenditure needs and resource availability at the local level, while other problems are caused by the failings of LAs themselves. Almost all LAs have a huge gap between the formally approved budget and what actually happens (Devas, 2002).

Additional problems regarding urban water services and the role of local authorities include the following (Nyangeri, 2002; Onjala, 2002a,b):

- Rampant corruption and continued political interference with the LA-managed water utilities
- Institutional set-up of local authorities is not conducive to efficient and effective provision of WSS services
- Application of unrealistic tariffs (which are commonly lower than MWRMD tariffs)
- Utilisation of water revenue for other services of the LAs.

The role of local authorities as water and sewerage undertakers has been defined in the Local Government Act (Republic of Kenya, 1986). Their role has changed over time, and the present water legislation treats the autonomous and incorporated companies of local authorities as potential Water Service Providers (WSPs) among other stakeholders.

5.2.4 Core definition and system description (present situation)

A systemic approach to water services sector analysis in Kenya requires that the present system (institutional framework) is adequately defined, named and described. The CATWOE process (Checkland, 1981; Checkland and Scholes, 1999) and VMAR process (Keskinen, 2002; Rubin, 2002, 2003a) can be used to structure a systemic model of the reality of the present system. CATWOE means dividing the functions of the system and its processes into components and analysing them. A CATWOE analysis of Kenyan water and sanitation services management is presented in Table 5.4.

Table 5.4 *CATWOE analysis of present water services management in Kenya.*

Customers	Direct: Water utilities and other water service organisations. Indirect: Customers of the water and sewerage systems, water users. Non-served citizens.
Actors	Personnel of water utilities, community water supply systems, etc. MWRMD (former MENR), NWCP, MOLG, and community managed systems.
Transformation process	The operative activities of the water utilities, that ensures appropriate water and sewerage services to customers.
Worldview	Kenya is a united, democratic and accountable society, which strives for more productive, prosperous and sustainable development. Customer-oriented and good quality water and sewerage services to citizens, following environmentally sustainable procedures.
Owners	Water utilities, owners of water and sewerage systems, asset custodians, government and regional authorities.
Environmental constraints	Laws and regulations on water services, their supervision and control, financing possibilities for operation and maintenance and development of water and sewerage systems.

Based on the CATWOE analysis the core definition of water and sanitation services management in Kenya as defined by the author is presented in Box 5.1.

Box 5.1 *Core definition of water services management in Kenya.*

CORE DEFINITION OF WATER SERVICES MANAGEMENT IN KENYA IN 2003

Institutional arrangements and management options that enable provision of good quality and adequate water and sewerage services to Kenyans. Services are provided by viable water utilities managed by appropriate public, private and community organisations.

The system description of the present institutional arrangements of water services management in Kenya (Figure 5.4) is based on CATWOE analysis and core definition. The present system description (Figure 5.8) is based on categorising the following essential elements of the water services operational chain: (1) internal actors, (2) external actors, (3) inputs, and (4) outputs. This interpretation of the transformation process of water and sanitation services conforms to the basic open system described by Robbins (1990, pp. 12-13).

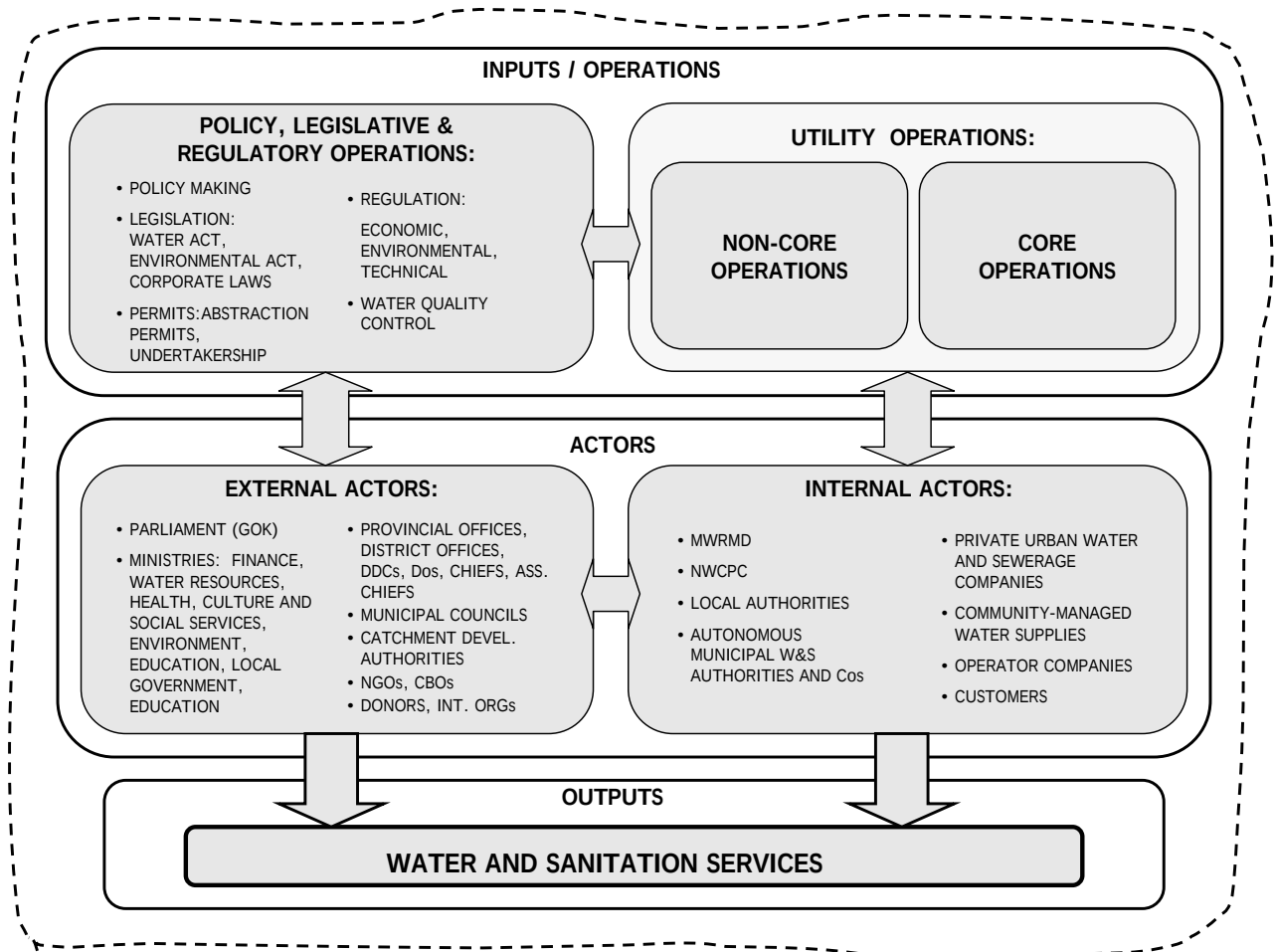


Figure 5.8 Present system description of the institutional framework for water and sewerage services in Kenya.

5.3 Visionary process of the water services reform in Kenya

5.3.1 Water sector reform process in Kenya

Past measures and policies in Kenya have not adequately addressed the problems of the WSS sector (Nyangeri, 2003). Since the 1970s, multilateral and bilateral donors have pushed major public policies as a precondition for development assistance (Article I). However, policies have lacked legitimacy and there has been discrepancy between official government policies and actual policy implementation. As a response to the perceived institutional shortcomings, the *National Policy for Water Resources Management and Development* was launched and officially approved in 1999 (Republic of Kenya, 1999a). The policy recognised the objective of handing over management responsibility of for government-owned water systems to (i) communities in rural areas, and (ii) local authorities in urban areas. Ownership of physical assets would yet remain with the government. The policy set priorities and management options in a sustainable manner, but did not adequately address the required measures for institutional changes and arrangements. A key concern was the establishment of a regulatory set-up to conform to the changing role of the Ministry of Water Resources Management and Development (MWRMD).

An Action Plan incorporated into the policy (Republic of Kenya, 1999a) was made to assist the government and sector actors in implementing and operationalising the policy. However, the Action Plan proved far too optimistic as to its time schedule (Article I), and the constraints and limitations of the policy itself complicated the plan further. As a subsequent measure the Government of Kenya (GOK) started other sector reform activities to restructure and improve performance, and to address the problems associated with water resources management (WRM) and the delivery of water supply and sanitation (WSS) services. Draft Country Strategies were prepared in 2001-02 (Republic of Kenya, 2001, 2002b). As a major enforcement measure, the Water Act 1972 (Cap 372) was amended and the new Water Act was enacted in October 2002 (Republic of Kenya, 2002a). It provides the enabling legal framework for the implementation and realisation of the stated policy objectives.

Implementation of the reform is outlined in the sector strategy documents that were further developed in 2002-2003: National Water and Sanitation Services Strategy (NWSS, 2003) and National Water Resources Management Strategy (NWRMS, 2003). A Water Sector Reform Secretariat (WSRS) was established in 2002 to coordinate the reform process, which is supervised by an inter-ministerial committee, the Water Sector Reforms Steering Committee (WSRSC) (Republic of Kenya, 2002c). A Transition Plan for the implementation of the Water Act 2002 and a Route Map for the reform process were prepared by the WSRS and consultants (Republic of Kenya, 2002d). The plan (Figure 5.9) outlines the implementation schedule of new institutional arrangements (Figure 5.11). The plan is dynamic and some changes have already been envisaged.

One of the key features of the reform process is the separation of the responsibilities for water resource management and water service provision, as stated in the policy and Water Act 2002. Water resources management issues will be regulated by the Water Resources Management Authority (WRMA), focal management bodies consisting of Catchment Area Advisory Committees (CAACs) and Water Users Associations (WUAs). The water services sub-sector will be regulated through the Water Services Regulatory Board (WSRB). The proposed Water Services Boards (WSBs) will be responsible for water and sanitation services. Water and sewerage services production will be by Water Services Providers (WSPs), which will be designated by the WSBs (Figure 5.11).

5.3.2 Scenarios for the future of water services in Kenya

Scenario techniques were used to describe alternative development paths for water services development and management in Kenya (Figure 5.9). Four alternative scenarios were built based on the overall Kenya scenarios (Kenya Scenarios, 2000). The drivers of the scenarios were based on the outputs of the Delphi surveys and findings of Article I on the main impediments and requirements for a successful reform process and on the main issues of the problem analysis of Chapter 5.2.3.

Scenarios were constructed using futures matrix techniques by first developing alternative futures images for the main drivers and then further developing them into scenarios. The results of the group work by experts in Kenya (May 2003) were utilised to further refine the scenarios. The scenario building process mainly followed the sequence presented in Chapter 3.6.3 (Figure 3.12; Mannermaa, 1999; Rubin, 2003b; Article V).

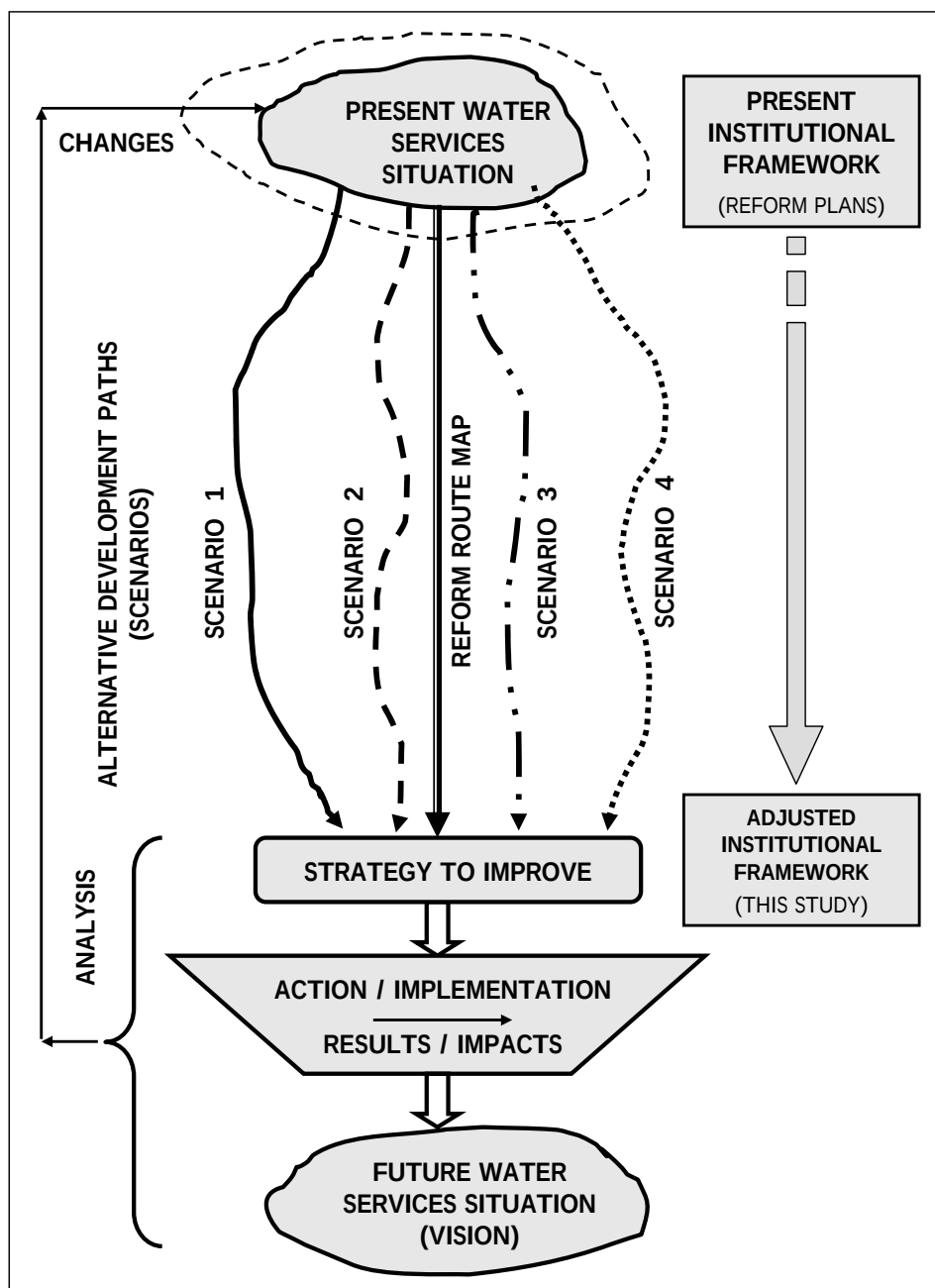


Figure 5.9 Scenario process that describes and analyses alternative future development paths for Kenya's water services management.

Various background scenarios were used in preparation of the Kenya Scenarios (2000). These include, among others, the global environmental scenarios developed by the World Business Council for Sustainable Development (WBCSD, 2000).

The four “overall environmental scenarios” used as a basis for the Kenyan water sector reform scenarios were (Kenya Scenarios, 2000, Figure 5.10):

- I. **El Nino** (No political reforms and no economic reforms)
- II. **Maendeleo** (Economic reforms with minimal political reforms)
- III. **Katiba** (Political reforms with minimal economic reforms)
- IV. **Flying Geese** (Simultaneous economic and political reforms).

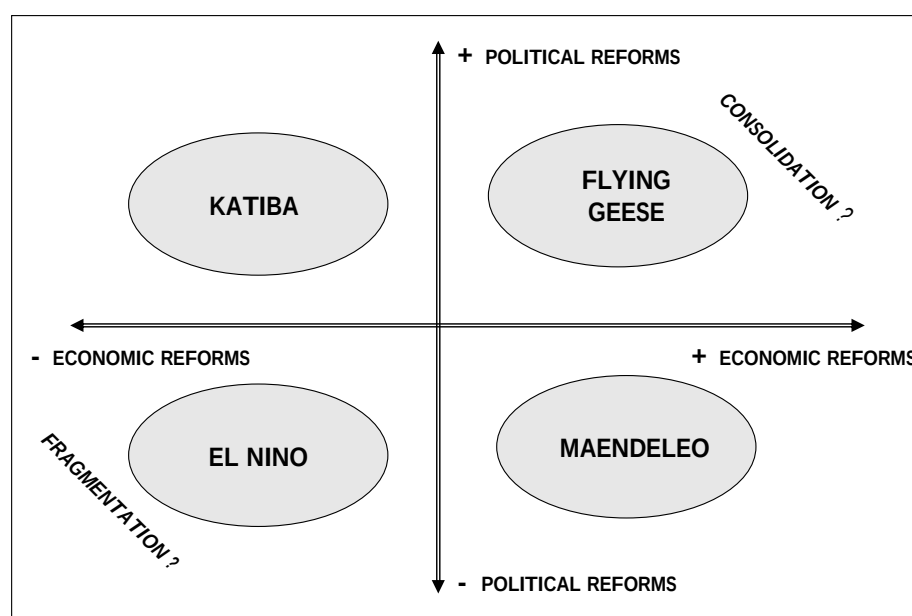


Figure 5.10 Basic scenarios related to overall political and economic reforms in Kenya.

These Kenya Scenarios (2000) are based on the overall political and economic development of Kenya with regard to major structural reforms. The “Flying Geese” scenario is the most optimistic and most desirable, while its realisation requires substantial changes in the direction of national politics and economy. Establishment of the new multi-party democratic government (NARC) in 2003 is expected to lead Kenya onto this development path.

The four alternative scenarios for the future of Kenya’s water services management are summarised in Table 5.5. These scenarios were based on the four overall Kenya scenarios in order to recognise local knowledge and commitment, which can be further strengthened in subsequent stages of the water sector reform process. The water scenarios were built by creating development paths according to five key drivers which are based on the key problem categories defined in Chapter 5.2.3: (i) water resources, (ii) financial resources and financing, (iii) human resources, (iv) institutional and legal arrangements, and (v) water sector organisations. More detailed scenarios based on the futures matrices and key drivers are presented in Appendix 2.

Table 5.5 Scenarios for alternative futures of water services in Kenya.

	EL NINO	MAENDELEO	KATIBA	FLYING GEESE
OVERALL SCENARIO DESCRIPTION (Kenya Scenarios, 2000)	<i>No political reforms and no economic reforms.</i> “El Niño is the road of neither economic nor political reform. El Niño leads to the total breakdown of Kenya.”	<i>Economic reforms with minimal political reforms.</i> “Maendeleo is the road of economic recovery without political reform. The overriding assumption in this story is that for as long as the economy is growing steadily, there will be little or no demand for political change.”	<i>Political reforms with minimal economic reforms.</i> “Katiba is the road of political reform with little parallel economic recovery as Kenyans search through their own traditions for comprehensive agreements that will allow them to face the future with confidence.”	<i>Simultaneous economic and political reforms.</i> “The Flying Geese story is about the success of determination, leadership, vision and the courage to venture into the unknown.”
OVERALL WATER SECTOR DEVELOPMENT SCENARIOS: DRIVERS: • WATER RESOURCES • FINANCIAL RESOURCES AND FINANCING • HUMAN RESOURCES • INSTITUTIONAL AND LEGAL ARRANGEMENTS • WATER SECTOR ORGANISATIONS	Water sector reforms remain highly unsuccessful and poorly integrated into overall social and economic development. Water utilities in many areas have serious difficulties to supply adequate water to customers due to acute scarcity of water resources. Financial and economic resources to maintain and improve facilities and services are inadequate, because the financial allocation and budgeting procedures of the responsible authorities have not been reformed. Human resources needed at various levels are not adequately assured. Training programmes cover only part of the sector needs and concentrate largely on the central government level personnel. Institutional arrangements for water and sanitation service provision remain largely unchanged. Separation of service provision and regulatory responsibility take longer than expected, and in practice the ministry remains the regulator of its own services for several years, thus causing an unhealthy (competition) situation among the service providers.	The water sector reform process concerns in practice only drinking water services, but in the sanitation sector institutional arrangements remain very fragmented. Authorities and implementing actors are mainly interested in drinking water services (due to expected economic gains), and as a result the sanitation and environmental situation in Kenya becomes worse, affecting seriously the quality of scarce water resources. As a result of improved economic efficiency and transparency the water sector financing receives more attention in the budgeting process, but the increased sector funding will be largely ineffective due to the inadequate institutional arrangements at the local level. An economic regulatory system will be put in place for water service providers, but institutional arrangements regarding clear separation of roles will remain poorly implemented for a number of years. Bureaucracy, incompetence, corruption and poor governance structures undermine the economic reforms carried out at the central government level.	The bureaucracy and inefficiency at the local level (districts, municipalities) is largely removed in the theory, as a result of major local government reforms. The overlapping arrangements between district administration and local authorities have been restructured by gradual downsizing and eventual abolishment of the entire district administration (for technical services). The water sector reform process puts rather effectively in place the new institutional arrangements (regarding drinking water services and water resource management), but without adequate economic reforms its practical impacts at various levels remain very limited. Competent water sector staff of the districts have been partly transferred to local authorities and partly retrained as local level regulatory staff. Inadequate economic and financial resources still limit their efficient work. Inadequate investments in water and sanitation infrastructure mean that the service coverage and quality remain low.	Simultaneous reforms within several sectors support each other and cause a boosting effect. Fragmentation of the institutional arrangements between the sub-sectors will finally be reduced, and for the first time the concept of integrated water resource management will be adequately internalised in Kenya. Sanitation and sewerage improvements are emphasised. As a result of comprehensive economic reform at the central government as well as other levels, and increased commercialisation of the sector, adequate financial resources will be secured. Financial allocations and budgeting procedures have been substantially strengthened. Resource allocation is more rational after the overlapping functions of the District Water Offices and local authorities (autonomous water and sanitation companies) were merged. The water sector reform process involved an extensive programme for human resource development and capacity building in all important areas of the sector reform and at various levels.

5.3.3 Future institutional framework for water services management

The future institutional framework for water services in Kenya is described in Figure 5.11. These arrangements are mainly based on the proposals of the water sector reform plan, legal provisions of the Water Act 2002 (Republic of Kenya, 2002a,d), and partly complemented by the findings of the scenarios on the alternative futures of water services (Table 5.5; Appendix 2). This structure shows the intended separation of the key functions of policy formulation, water resources management, regulation, and service provision and production. Although this structure is enforced by the Water Act 2002, in reality it fulfils the separation of key roles only fictitiously, as discussed in Chapter 5.4.2. Consequently, a further development of the institutional framework is presented in Figures 5.12 and 7.1.

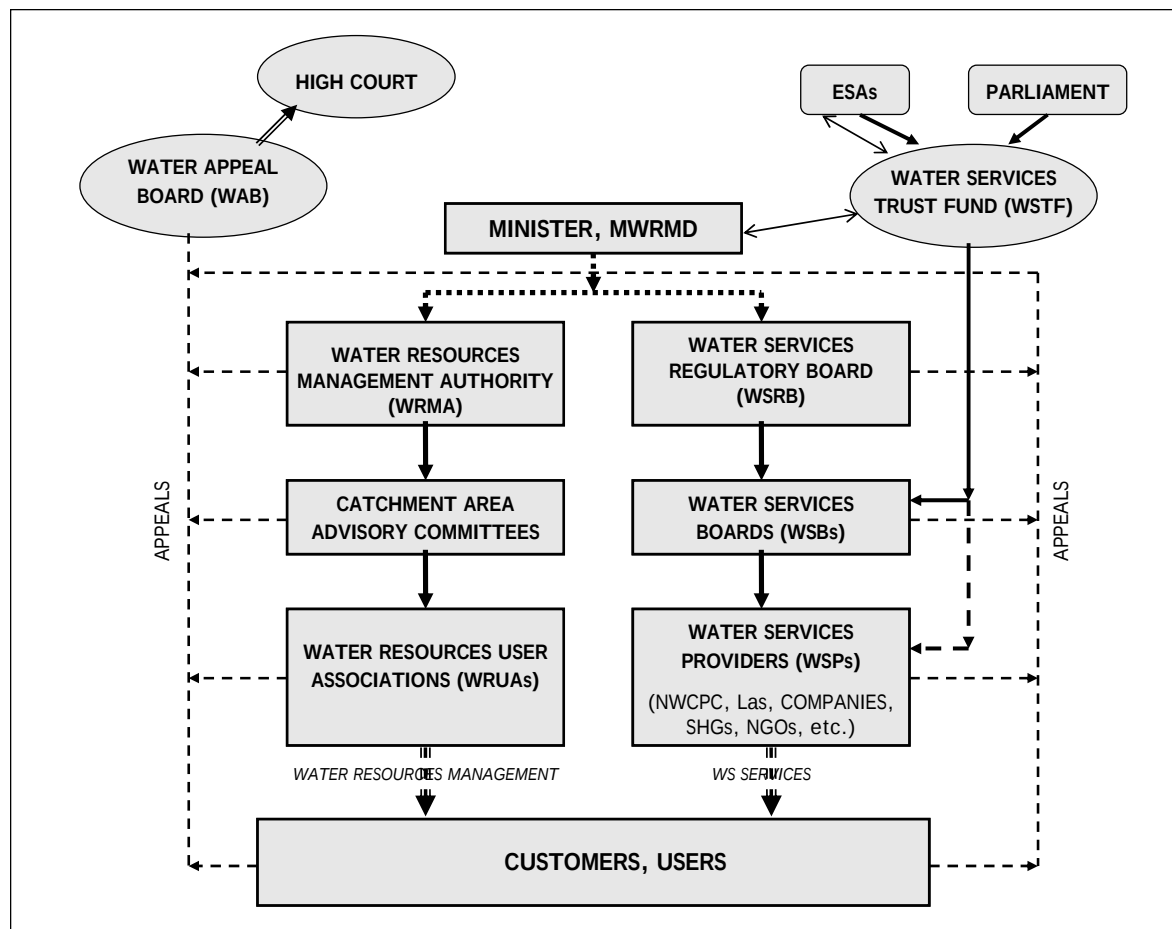


Figure 5.11 New institutional arrangements proposed in the water sector reform process (modified from NWSS, 2003; Republic of Kenya, 2002a,d).

5.3.4 Core visions and system description (future situation)

While the core definition (Box 5.1) describes the present situation of the system, the core vision describes the future situation of the system, that is, what the organisation or system could be like in the future and what its future purpose would be (Mannermaa, 2003a; Rubin, 2002, 2003a). The core vision can be based, for instance, on SWOT analysis, alternative scenarios, a futures matrix, or a futures workshop.

The ongoing water sector reform process itself includes a vision of the future state of water management in Kenya. This envisioning process has involved a large number of sector professionals and other stakeholders in several workshops and meetings, where the future of the Kenyan water sector has been outlined. The global and regional vision documents – such as WWV, Vision 21, FFA, and others – do not include detailed WSS visions for Kenya. The Global Water Partnership's (GWP) Eastern Africa regional office has developed an overall sector vision. The Kenya National Development Plan (NDP) 2002-08 (Republic of Kenya, 2002e) defines the water and sanitation sector targets. The National Water Services Strategy (NWSS, 2003) also defines long term strategies and visions.

A weakness of sectoral visions has been that they have not adequately considered the overall social and economic development in Kenya, which is a prerequisite for a successful water sector reform. An overall vision for Kenya's development was prepared in a project that continued the Kenya Scenarios project (Kenya Vision, 2003). From August 2002 to January 2003, a group of about 50 young Kenyans under the auspices of the Institute of Economic Affairs (IEA) developed a vision for Kenya spanning through to 2027. The key elements of the Kenya Vision 2027 are described in Box 5.2. Kenya Vision 2027 emphasises democratisation of the society and sustainable economic development (Kenya Vision, 2003).

Box 5.2 *Main elements of Kenya Vision 2027 (Kenya Vision, 2003).*

KENYA VISION 2027:

- ❖ A united nation with a sense of common purpose and shared destiny
- ❖ A mature, free and tolerant society
- ❖ A dignified and confident people
- ❖ A just, democratic and accountable nation
- ❖ An ethical society and leadership with integrity
- ❖ A safe, secure and caring nation
- ❖ An economically just society
- ❖ A productive, prosperous and innovative people
- ❖ Pursuing sustainable development
- ❖ A responsible African member of the global community of nations

Core visions can be defined for different time stages and cross-sections, that is, they can form an evolutionary succession against time (Mannermaa, 1999, p. 126). This makes it easier to perceive how visionary targets can be achieved in stages. Strategic target setting can thus be structured as interim sub-targets on the way to the futures vision. Consequently, core visions can be developed for alternative reform scenarios in order to consider how well the reform objectives and vision will be realised in various scenarios.

Based on the alternative core visions, respective futures models, that is, system descriptions of the future institutional frameworks for water services management in Kenya can be made. When preparing the system descriptions, an analytical tool based on the so-called VMAR method can be used (Keskinen, 2002; Rubin, 2003a). Here, the VMAR process was slightly modified into a VisMASST process which is presented in Table 5.6. The VisMASST process helps conceptualise the linkage between visionary and strategic management in reform process implementation as highlighted in Article V.

Table 5.6 *Modified VisMASST analysis of the water and sanitation services sector in Kenya.*

Vision	Kenyans have access to reliable and good quality water and sewerage services, provided by efficient and accountable service providers following customer-oriented and environmentally sustainable procedures.
Mission	To provide good quality, adequate water and sanitation services to Kenyans by viable utilities managed by appropriate public, private and community organisations based on a diversity of institutional and management options.
Actors	Water utilities and their staff, owners of water systems, asset custodians, communities, government and regional authorities, users / customers, other stakeholders and their networks, rules and regulations.
Structure	Institutional arrangements and frameworks for water and sanitation services management in Kenya, based on the appropriate roles and responsibilities of actors and sustainable technologies and utilisation of resources.
Strategy	A strategic development programme and continuous interactive stakeholder dialogue process to implement the reform process.
Transformation	The water sector reform process, which results in successful operative activities of the water utilities ensuring appropriate water services to customers.

Based on the core vision and other elements of the VisMASST analysis (Table 5.6), a future system description of the institutional framework for water and sewerage services in Kenya has been made. The future system description is shown in Figure 5.12. This system description already points out some weaknesses of the proposed institutional framework presented in the reform plans. These weaknesses are discussed in detail in Chapter 5.4.2.

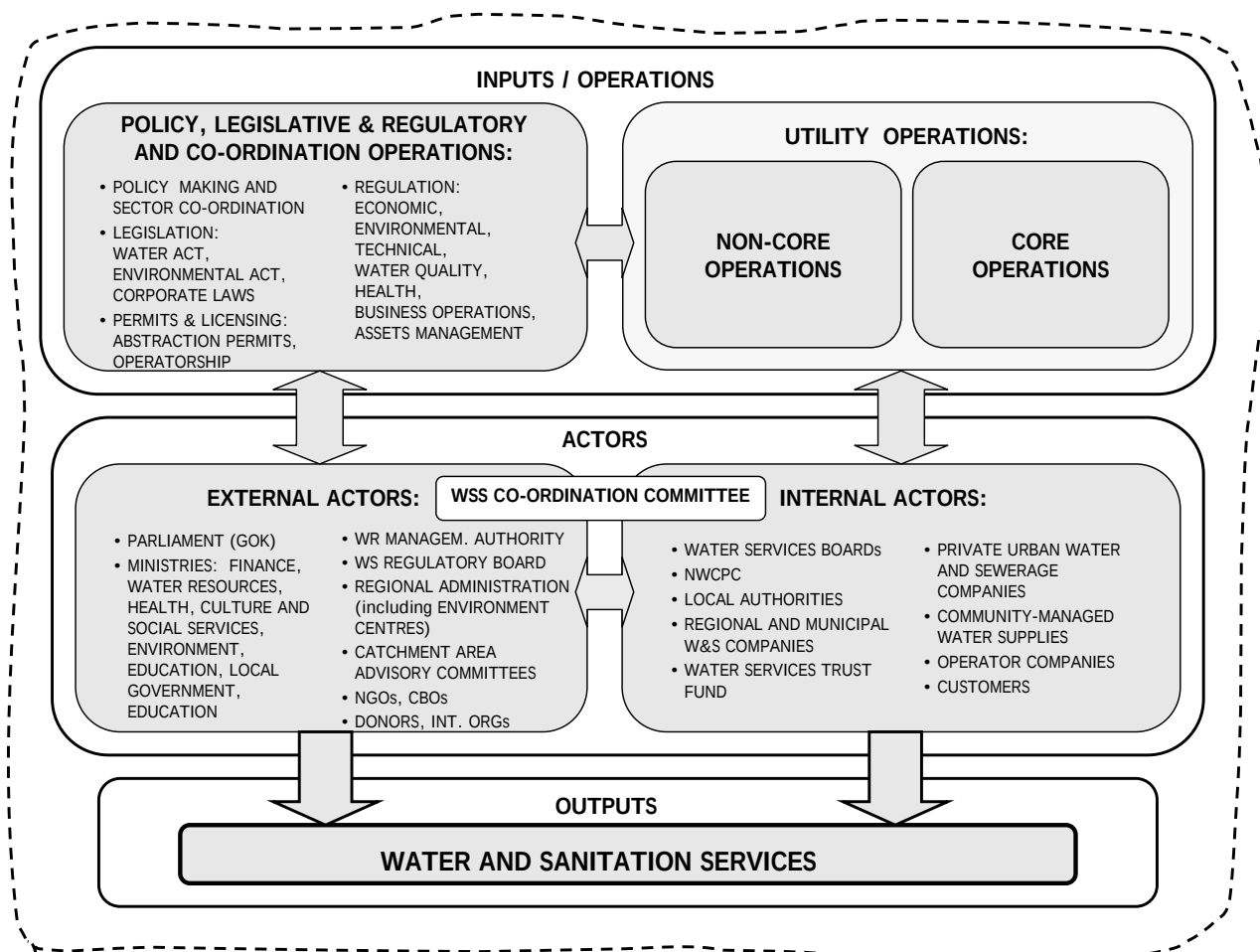


Figure 5.12 Future system description of the institutional framework for water and sewerage services in Kenya.

5.3.5 Comparison of present system description and reformed futures model for institutional frameworks

The comparison of the present and future system descriptions and the situation with water services management in Kenya are mainly based on a SWOT analysis of alternative scenarios for the future of Kenya's water services management, including the present plans for the reform process and its implementation. The SWOT analysis is based on a literature review, field experience, group work done with Kenyan experts in a workshop in May 2003, and Delphi testing among Kenyan experts. A concise SWOT analysis is presented in Table 5.7 and a more detailed SWOT analysis in Appendix 3.

The present and future system descriptions (Figures 5.8 and 5.12) differ from each other in some important areas of institutional arrangements. A WSS Co-ordination Committee is proposed to alleviate the present problems of fragmentation and poor co-ordination between (i) policy level actors in various sectors related to water management and (ii) operational level actors of WSS service provision. The Co-ordination Committee would be a non-rigid body without any separate administration. It could partly continue the work of the Water Sector Reforms Steering Committee (WSRSC) and the Secretariat (WSRS). Another significant change is the establishment of Regional Environment Centres (RECs) to deal with environmental permits and regulation at the provincial or river basin level. RECs could also be established through restructuring and reallocation of resources – either within the present river basin development authorities or even as part of the provincial administration.

Table 5.7 *SWOT analysis of the water services in Kenya and the reform process.*

STRENGTHS (S)	WEAKNESSES (W)
• Institutional change: The need for water sector reform is strong due to the long period of poor sector performance and inadequacy of resources. • New WRM strategy emphasises conservation and equitable distribution and sustainable use of water resources. • New legal framework (Water Act 2002) intends to clarify roles and separation of policy making, water resource management, and service provision and production. • Reform process creates trust and attracts external funding (strong external support from donors). • Success in some pilot utilities (Nyeri, Eldoret) encourages others to restructure and improve. • Reform facilitates improved service coverage and quality (also in sanitation). • New arrangements facilitate realistic tariffs, appropriate internal cross-subsidies, and efficiency in service provision. • Reform process is asset-based, focuses on specific areas and emphasises poverty alleviation. • Existing technical staff is already trained, but the reform aims at better technical and managerial capacity.	• Reform process has started top-down from the national level, and it is also fairly donor and consultant-driven. • Proposed and already legally enforced institutional arrangements do not fully eliminate the multiple roles of MWRMD. • Government intervention continues strong in areas that do not attract autonomous WSPs. Ownership of assets is still unclear. • Sustainable financing mechanisms have not been adequately addressed in the new policies and strategies. • Present institutional arrangements are working poorly (deconcentrated, centralised, bureaucratic). • The future role of local authorities has not been adequately expressed in the reform plan. • Assumed time schedule for reform process is unrealistic in relation to the local capacity and resources. • Sanitation is not adequately addressed in the reform process (inadequate integration). • Low motivation among civil servants. • Inadequate engineering expertise and know-how. • Inadequate customer orientation and sensitivity.
OPPORTUNITIES (O)	THREATS / LIMITATIONS (T/L)
• New political culture (NARC) can provide better political commitment to reforms. • New water policy provides enabling environment for reform continuation. Water Act 2002 provides a solid basis for appropriate institutional arrangements. • Long-term sustainability and conservation of water resources through holistic catchment area thinking and demand management strategies. Improved ethnic harmony as a result of reduced water conflicts. • Reform provides opportunities for human resource development (training and redeployment). • New arrangements encourage applied research and innovative technologies. • Good economic and business opportunities for WSPs. Increased efficiency of operations and service delivery. • Increased involvement of various stakeholders. • Independent regulatory arrangements proposed, but regulation details and local capacity need more elaboration.	• Kenya has a critical scarcity of water resources. Resource allocation may pose conflicts. • Improved service provision leads to increased water use and thus increases pollution. • Political interference in establishing WSB boundaries. Politicians may have vested interests. • Strategies and plans may be too short-sighted. • Cost of the reform process: Allocation of financial resources (and budgeting procedures) may not in practice facilitate implementation of reform. • Inadequate human resource capacity, especially at the lower levels (provincial, district, divisional). • Assets may be undervalued, causing poor cost recovery. • Local commitment to reforms may be low or at least at risk. Resistance to change may arise from several reasons, e.g. from fear of losing jobs. • New policies and strategies may be recognised in principle, but old procedures (business-as-usual) may persistently continue. Informal institutions are difficult to change. • Dissemination of the policy and other reform components may not succeed as well as hoped in the field. Lack or overlapping of communication.

5.4 Implementation of water services reform in Kenya

The Implementation Plan for the Water Act (Republic of Kenya, 2002d) and the water sector reform route map (Figure 5.13) outline the proposed implementation of the water services reform process in Kenya. Details of the required main institutional arrangements are also presented in the National Water Services Strategy (NWSS, 2003).

The SWOT analysis (Table 5.7) and alternative scenarios (Table 5.5 and Appendix 2) indicate that the reform process involves a lot of uncertainties. Therefore, a flexible and interactive strategy is required for reform implementation. The reform process is a typical case where a visionary approach to strategic management should be applied in order to assist decision making and implementation on a long-term basis to achieve the shared vision and goals (Chapter 3.6.6; Article V). As a visionary process, the entire reform process should be viewed for instance according to the guidelines of the “strategic architecture” presented by Kamensky (2000), and described in Article V (Fig.12). In the ongoing reform process the initial stages (vision, mission, various analyses, scenarios, etc.) have not been comprehensively and participatorily executed, although the process has tried to address some of these concepts. This case study attempts to demonstrate the visionary process in a more systemic manner, although various stages are simplified due to time and resource limitations.

5.4.1 Strategic development programme for reform implementation

Based on the visionary scenario process (VIS) – theoretically drawing on the soft systems methodology (SSM) – and on the concept of strategic architecture (Kamensky, 2000; Article V), a sequenced strategic development programme is needed for the implementation of the Kenya’s water sector reform. The strategy should define both the long-term strategic objectives for achieving the goals (best scenarios and vision) and the short-term strategic actions step-by-step as indicated in the concept of visionary development task by Malaska and Holstius (1999) and described in Article V.

As mentioned, the Implementation Plan for the Water Act (Republic of Kenya, 2002d) and the associated reform route map (Figure 5.13) constitute the official strategy of the Kenyan Government for reform implementation. The proposed reform route map (Figure 5.13) provides an outline of the main actions to be taken in the reform process and their time schedule. The Action Plan attached to the National Water Policy (Republic of Kenya, 1999a) was fairly unrealistic and was not in line with available resources and perceived development of other sectors. However, recent strategy documents also assume that the policy intentions and regulations of the Water Act 2002 (Republic of Kenya, 2002a) will be enforced and implemented without major drawbacks and delays.

Yet, experiences from other countries and the results of Delphi surveys suggest that policy reform is usually constrained by several impediments and uncertainties (Article I; Chapter 4; Chapter 5.4.3). Thus, the need still exists to prepare a realistic and comprehensive *strategic development programme (SDP)* for the Kenyan water sector according to the proposed visionary process. An example of a relevant structure of a strategic development programme including a medium-term action plan up to the year 2010 and strategic targets up to the year 2025 are presented in Appendix 4. This draft strategy is based on the water sector scenarios (Chapter 5.3.2) and utilises elements of several scenarios (Table 3.4 in Chapter 3.6.3). This draft strategy could be used as a basis for more comprehensive and continuous strategic planning in Kenya.

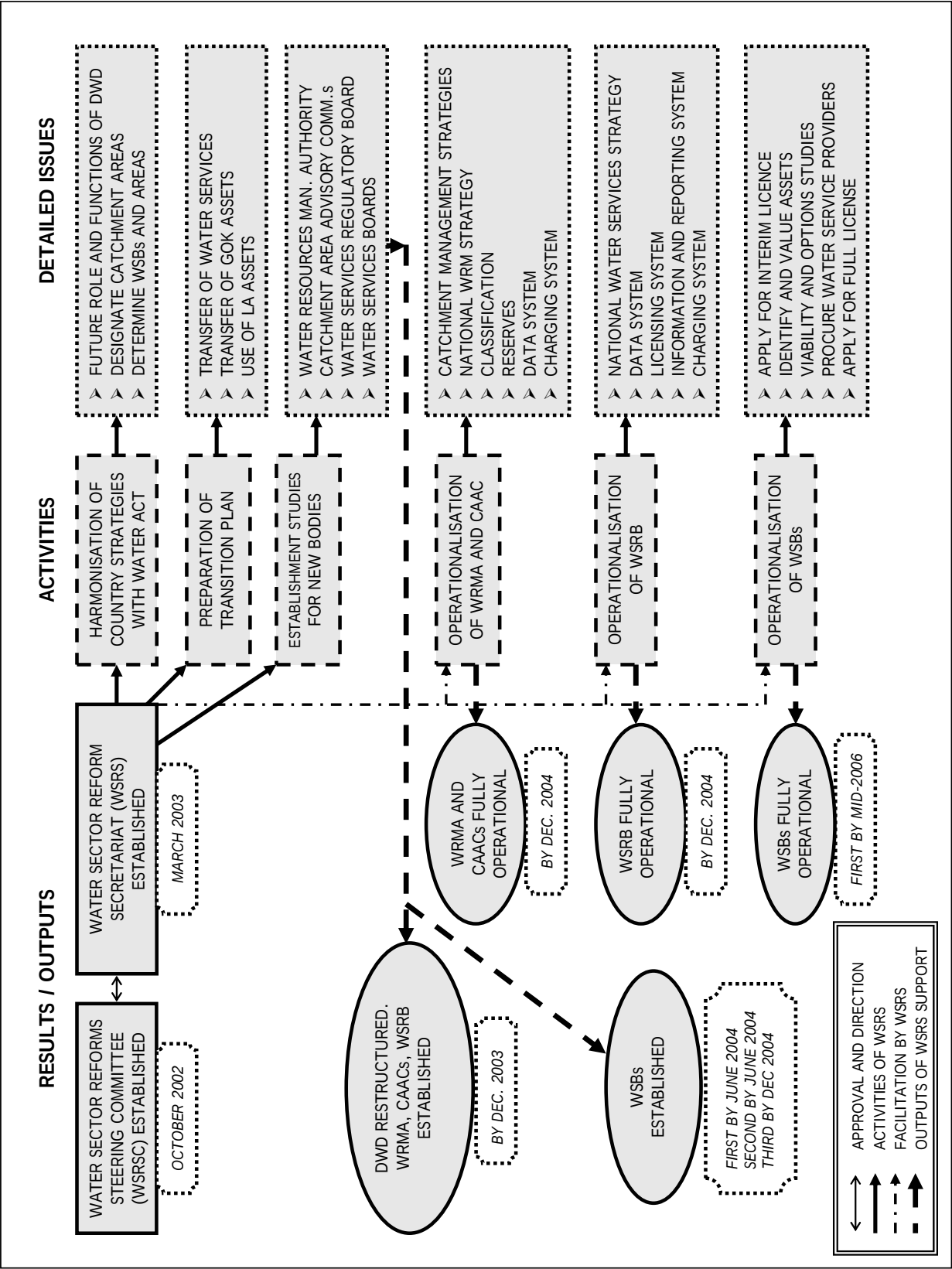


Figure 5.13 Proposed route map for Kenya's water sector reform (modified from NWSS, 2003; Republic of Kenya, 2002d).

5.4.2 Problems with the present reform implementation plan

The reform process proposed by GOK is in principle well planned and reflects an appropriate interpretation of the new policy and strategy objectives. However, it is assumed that various stages and decisions during the process will be successfully implemented according to the plans. There is no substantial assessment of uncertainties, risks and alternative approaches concerning situations where implementation does not proceed as planned. Some uncertainties and potential problems in reform implementation are addressed in the following to complement the SWOT analysis of the alternative scenarios. The issues include some of the main impediments discussed in Article I and complement the drivers described in Chapter 5.3.2.

Political constraints

Reorganisation of the water sector – and the diminishing role of the government in actual service provision and production – is expected to reduce political interference in the operation of water systems. However, it is probable that politicians and other individuals with vested interests will continue to interfere in water management at the regional or local level, for instance in the Water Services Boards (WSBs).

Institutional arrangements, including the legal framework (Water Act 2002)

The Water Act 2002 (Republic of Kenya, 2002a) provides a legal background for viable water services, but besides defining the key roles and creating new entities for water resources management and service provision and regulation, the new act does not substantially change much – especially eliminate the deconcentration – compared to the old Water Act Cap 372 (Republic of Kenya, 1972). Furthermore, sector reorganisation and new institutional arrangements as such do not ensure viable improvements in sector performance, unless organisational and individual behaviour and management practices substantially improve.

The Water Act 2002 was probably intended to clarify institutional arrangements, but it is still unable to eliminate the multiple roles of the ministry in charge of water. According to the act, almost all new bodies to be established will be directly or indirectly subordinated to the Minister of Water Resources Management and Development (Figure 5.11). These new agencies to be appointed or managed by the Minister include the Water Resources Management Authority (WRMA), the Water Services Regulatory Board (WSRB), the Water Services Trust Fund (WSTF), and even the Water Appeal Board (WAB). Indirectly the Minister (MWRMD) will also wield power over the Water Services Boards (WSBs) which he nominates and which are answerable to the WSRB. Similarly, the Minister will be involved in the nomination of the Catchment Area Advisory Committees (CAACs). Thus, eventually the Minister and the MWRMD will have – directly or indirectly – similar multiple roles both in water resources management, service provision and production, and regulatory and supervisory functions as they had in accordance with the old water act. These arrangements may perhaps be justified by better co-ordination of water sector activities, but from the point of view of good governance and autonomy of supervisory and regulatory agencies they are unacceptable.

The National Water Conservation and Pipeline Corporation (NWCP) will continue both as a bulk water supplier and as a WSP among other undertakers, but it will remain under direct jurisdiction of the MWRMD also in future. This poses a serious contradiction and a biased competition situation compared to other WSPs. Moreover, the NWCP will in some areas have a similar status as the Water Services Boards (WSBs).

Despite these serious concerns about the formal institutional arrangements (sector reorganisation and new legislation), there are other even stronger concerns regarding real action and co-ordination. Achievement of future targets will depend much more on *informal* institutions than *formal* ones. Changing people's behaviour and getting individuals and organisations to comply with established legislation and regulations as well as following the principles of good governance and transparent and open management culture are the keys to efficient and effective performance of the water services sector.

Regulatory framework

Reform plans and the Water Act 2002 indicate that all regulatory activities will be vested in two new regulatory and licensing agencies, namely the Water Resources Management Authority (WRMA) and the Water Services Regulatory Board (WSRB). Both agencies will be appointed and supervised by the Minister (MWRMD). The Water Act 2002 clearly states that the WSRB will be appointed by and answerable to the Minister, and will thus not be an independent regulatory body. This is a serious weakness in the proposed regulatory arrangements, especially as long as the MWRMD will continue as a water undertaker or WSP itself during the transition period.

The details of the structure and organisation of the WSRB are still open, but at this stage it seems that the expectations on the role and functions of the WSRB are over-optimistic. Although there is definitely no point in making such an over-dimensioned and bureaucratic regulatory framework as, for instance, in England and Wales, it is doubtful whether one fairly centralised regulatory and licensing authority can cope with all the diverse regulatory aspects. Regulation is needed at least in economic, environmental, technical, water quality, and health issues, and thus requires varied professional expertise. In the future, regulation may be needed also in business operations and assets management. While economic and technical regulation could well be mandated to the WSRB, at least water quality and environmental and health regulation should preferably be mandated to other existing agencies that already have functioning regional and local representation. These functions could be better performed by regional and local offices of health and environment authorities. In any case, there may be need in the future to establish (develop) regional (provincial) environment centres (RECs) under the Ministry of the Environment and Natural Resources (MENR) or the National Environmental Management Authority (NEMA) to deal with the increasing responsibilities. The aspects of risks and their sharing in regulatory arrangements also need to be considered.

The WSRB which consists of a chairman and ten other members appointed by the Minister is supposed to operate on the national level. The WSRB will have at least 18 main functions, most of which require extensive monitoring and supervisory capacity. It is not clearly indicated in the Water Act or in the reform plans how the WSRB will eventually be organised to ensure adequate capacity to deal with its challenging tasks nationwide. Despite a long list of functions, some important areas of regulation, such as water quality and environmental regulation, are not clearly included in the WSRB's tasks – nor are these regulatory tasks designated by the Water Act 2002 to any other agency, or placed under the jurisdiction of other relevant ministries, such as the Ministry of Health (MOH) or the MENR. There is a need to coordinate these regulatory tasks defined in the Water Act and the Environmental Management and Co-ordination Act.

Water sector organisations

The reform plan proposes establishment of several new water sector organisations and/or substantial reorganisation of the present organisations. The intention is probably good, but the challenge is how to turn the former bureaucratic mechanistic organisations into modern organic and strategic organisations (Chapter 3.4.3). Reorganisation alone cannot ensure any real change in internal operations and organisational culture. Individuals working within these organisations are the key factor, and changing the individuals' working morale, motivation, skills, and performance is essential. This, again, requires much more than reorganisation as discussed in Chapters 3.4.3 and 3.5. Comprehensive capacity building (CB) and human resource development (HRD) programmes are needed to ensure sustainable long-term development of these water sector organisations.

The Water Act 2002 and the reform plan spell out that the Water Services Boards (WSBs) bear the main responsibility for water and sanitation services to customers. WSBs can contract agents – Water Service Providers (WSPs) – who actually produce these services for customers. WSPs may include both public and private actors (Figure 5.11). The majority of the existing water systems are operated and managed by the MWRMD, the NWCPD and local authorities, which have been deemed inefficient and non-performing. It is unrealistic to assume that new competent and efficient WSPs would grow out of nowhere. Thus, it will take time and extensive capacity building efforts until new WSPs will be able to fulfil their service production functions effectively.

Water resources availability

Although the reform action plan and the strategies (NWRMS, 2003; NWSS, 2003) recognise the obvious risks of serious water scarcity in Kenya in the future, the strategies do not provide alternative plans for various scenarios. As elaborated in Chapter 5.2.3, the worst scenarios on water resources availability are really alarming. The water resources research compendium of the Kenya Scenarios (2000) provides useful information for an analysis to assess the risks and alternative futures of water scarcity and consequent conflicts in Kenya, which have not adequately and proactively been addressed in the strategies (IEA, 2001).

Financial and economic resources

The suggested reform plan and strategies do not specifically provide new strategies for increased financial resources for the water sector, but rather more efficient use of current resources. The stated new policy objectives for future sector financing are based on the following (NWSS, 2003): (1) mobilisation of local resources and complementing them with external resources, (2) increasing investment efficiency by assessing demand and prioritising rehabilitation, (3) ensuring sustainability of WSS systems through appropriate pricing policy, and (4) rationalising financial management systems to increase efficiency, transparency and accountability.

The strategies suggested to achieve these objectives include (NWSS, 2003):

- i) Provision of WSS systems with financial autonomy by WSBs
- ii) Restructuring of financing mechanisms
- iii) Restructuring of pricing policy
- iv) Making investments into the sector
- v) Making a deliberate effort to attract foreign capital and technical investment into the sector.

The investment financing needs of the water sector are enormous (Chapter 5.2.3; Article III). According to the provisions of the Water Act 2002, a Water Services Trust Fund (WSTF) was already gazetted in 2003. The WSTF is expected to raise investment funds from external support agencies (ESAs) and as budgetary allocations from the Parliament. Yet, it is likely that the above mentioned strategies and activities – including the new WSTF – cannot fill the financing gap of the WSS sector in Kenya. In addition, the transaction costs related to the implementation of the reform process are relatively high and should be adequately reflected in water sector development costs.

Human resource development and capacity building

The reform plan (route map: Figure 5.13) and the strategy documents (NWRMS, 2003; NWSS, 2003) emphasise the need for human resource development and training but do not yet address the requirements and activities in much detail. However, it seems that the main emphasis is on central level HRD, although in practice the biggest challenges will be at the local and regional levels. Successful implementation of the water sector reform and continued proper water management require a substantial increase in the number of qualified professional water sector staff. A detailed HRD and training plan, with highly diverse job descriptions, is required to address the quantitative and qualitative personnel requirements of the reorganised water sector organisations.

Short-term and non-integrated planning

Kenya maintains the five-year National Development Plan (NDP) system, which also provides a good overall framework for sector-wide strategic planning. Yet, experience shows that, in practice, NDPs do not necessarily lead to integrated and coordinated action among various sectors, and sector policies may often conflict with each other. Targets and action plans based on NDPs and sector policies have often been unrealistic. NDPs and sectoral development plans should be accompanied by long-term visionary development plans, which are adequately coordinated and comply with the overall national vision.

Communication and dissemination

Communicating and disseminating the new strategies and institutional and regulatory arrangements to all stakeholders at all levels throughout the country poses a challenge. It requires a lot of advocacy and communication, which takes time and resources. Various stakeholders also need to be properly informed about their new roles and responsibilities, since some resistance and differing interests among stakeholders may also arise. Time delays in reform implementation may largely result from difficulties in operationalising the new arrangements at the grass-roots level.

Governance issues

Governance problems have persistently undermined development efforts in Kenya as described in Chapter 2. Widespread bureaucracy and a high level of corruption are among the main symptoms. According to the corruption perception indices (CPI), Kenya has continuously stayed among the worst ranked countries in the world, being number 123 out of the 133 countries included in the 2003 study (Transparency International, 2003). What ensures that the new agencies and authorities proposed for the water sector would function any better than the old ones? Human rights issues in Kenya will also remain unsolved, although the latest developments look more promising (HRW, 2002).

Role of the private sector

The future institutional framework – as proposed in the reform plan and enforced by the Water Act 2002 – rests strongly on the assumption that private sector companies will emerge as major Water Service Providers (WSPs) in the future. The stand of the MWRMD has been fairly shaky regarding the privatisation of the water sector. Ministry officials tend to deny that there are major intentions to privatise service production, but strategic decisions prove otherwise. On the other hand, there seems to have been a lot of external pressure towards increasing private sector participation. For instance, the World Bank has already criticised the new Water Act 2002 for not being supportive enough of PSP.

However, the provisions of the Water Act 2002 do not really seem to limit private sector participation. Water Services Boards (WSBs) are mandated to contract WSPs from among either public or private operators, and similar regulations apply to both. A bigger concern is how effectively the fairly centralised regulatory agencies – especially the WSRB – can regulate, supervise and coordinate all various WSPs in a new “market-oriented” situation. Another unclear issue is the legal situation with the ownership of water system assets. The Water Act 2002 indicates that WSBs will act as asset custodians for all public water systems. The situation with private water systems and community water systems has not been defined clearly in the act.

As described by Nyangeri (2003) and UNCHS (1998), Kenya still has very little experience from private water services management. Besides the few small private water operators mainly in the Nairobi area, private sector involvement has so far been limited to consultancy and contractor services. Establishment of adequate local capacity for effective private water services management in Kenya will take substantial time and support from the government in terms of policy and capacity building efforts.

Role of local authorities / municipalities

The initial intention was clearly to hand over water services management responsibilities to communities in rural areas and to the NWCP and local authorities in urban areas (Republic of Kenya, 1999a). The recent intentions concerning the reform process, however, seem to contradict earlier intentions. It is understandable that confidence towards local authorities in water and sewerage service provision is low after a long period of poor performance. The reasons for the poor performance of LAs in the water sector were to some extent discussed in Chapters 2 and 5.2.3. The recent processes of commercialising and incorporating water and sewerage departments of local authorities into autonomous municipal companies has been a commendable effort aimed at improving their performance and should thus be fully supported instead of discouraged.

Although local authorities' efficiency and capacity to manage water systems have in the past proved inadequate, recent attempts to almost entirely sideline LAs in the water service provision and production seem short-sighted. Kenya has a long history of local government based on the British tradition, but the system was weakened and strongly controlled by the central government in the post-independence period, primarily in the name of national unity. As a result, local political mechanisms and incentives to perform were largely undermined. Many efforts were made in the 1980s and 1990s to re-strengthen local governments as indicated in Appendix 1. Most were donor-driven and were not taken very seriously by the national authorities. As a result, the performance of local governments in terms of revenue generation and service delivery deteriorated badly. In recent years, however, fuelled by political and economic pressures to reform, some genuine attempts to

strengthen local governments have been undertaken (Smoke, 2000). The Local Government Act (Republic of Kenya, 1986) is currently under review. The amended act should be adequately adjusted and modernised to comply with water legislation while also recognising the potential of reformed municipal water companies to continue as successful Water Service Providers (WSPs) and local authorities (LAs) to be owners of water utility assets.

The proposed new constitution of Kenya introduces some reform to local government structures. Yet, local authorities do not feature prominently, but basic provisions are made to strengthen them. For instance, it is suggested that only some local authorities (cities and municipalities, that is, those having a district status) should have the right to impose taxes to which the residents must agree and to receive funds from the central government. Local authorities could also conduct local referenda and the MOLG could no longer interfere with their activities as long as they are carried out within the constitutional and legal framework (Kenya Constitution, 2003). However, the formulation of the Constitution is still under way and, for instance, the “devolution chapter” has not yet been drafted.

Public utility budget reform and utility management

The problems related to public sector water utilities’ inefficiency could to a large extent be solved by adopting output-based budgeting instead of the traditional input-based budgeting. Even the World Bank is presently supporting output-based aid and budgeting as a remedy for public sector inefficiency as part of their recent water resources strategy (World Bank, 2003b). In output-based budgeting, policy decisions drive the allocation of resources instead of decisions on inputs or resources driving policy. In traditional input-based budgeting, the focus is on administrative detail. In output-based budgeting, the focus shifts from the details of material and resource inputs to considering what agencies actually do and deliver. Output-based budgeting increases the flexibility of resource management. Outputs are actually service options that agencies can either purchase or reject (Figure 5.14).

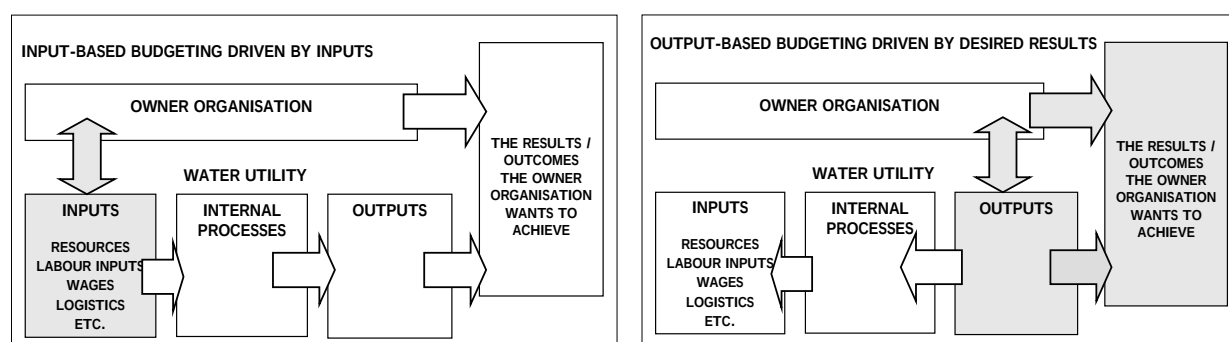


Figure 5.14 Output-based budget model for public sector organisations (modified from Butcher, 2003).

This kind of output-based budgeting and other budget reform measures could be taken into use by all types of public water service providers in Kenya. Many local authorities have already reformed their water and sewerage departments into autonomous companies that apply commercial principles of budgeting, accounting and financial management analogous to those of private companies.

Because the ownership of water utilities and their assets is still an unclear issue, the responsibility for effective owner control in the output-based budgeting model also

remains unsolved (Figure 5.14). In the case of municipal water companies, owner control should be exercised by local authorities who ideally should retain the ownership of their autonomous water companies. In the case of other public water utilities, owner control should preferably be carried out by the Water Services Boards (WSBs) and actual budgeting and financial management procedures and their reform by the WSPs themselves.

Operational and management inefficiencies of public water utilities can also be eliminated by appropriate utility level reform measures. The examples of the few successfully incorporated municipal water companies – such as Nyeri and Eldoret – prove that management reforms can transform inefficient public utilities into commercially and efficiently functioning autonomous utilities. For long-term viable operation, utilities should develop their management systems to take into account also strategic (SM) and visionary management (VM) perspectives in addition to short-term operational management. As recommended in Article V, integrated application of VM as a long-term proactive approach to SM and knowledge management (KM) as the platform to support decision making and management is strongly needed in Kenyan water utilities. Utility level reforms should include better and more reliable data and information utilisation and performance monitoring using appropriate indicators. Gradual development of a knowledge management culture is essential and possible for Kenyan water utilities, both public and private.

Role of district and provincial administration

The water sector reform will inevitably cause significant changes in the roles and responsibilities of the provincial, district and divisional level water offices. How these will change is still largely an open question, but should be carefully planned in connection with the strategic development programme (Chapter 5.4.1).

The present provincial and district level administration in general of Kenya is bureaucratic and inefficient in general. The district level is too crowded with institutions to enable efficient planning, co-ordination and implementation of projects. There are several Regional Development Authorities whose functions duplicate those of some ministries and districts. Confusion sometimes exists between the earlier powerful provincial administration and district administration: the District Focus policy strengthened districts at the expense of provinces. The present Kenyan administrative system overstrains the scarce resources of technical and managerial capacities and finance. The administrative set-up is too complex to work efficiently resulting in low morale due to the failure to professionalise the public service because of bureaucratic inefficiency and incapacity (Peters, 1996).

The same could easily happen with the water sector reform: too many new tasks may be planned for the existing and new authorities without safeguarding the required resources. Peters has proposed that it might be worthwhile considering abolishing the district administration and transferring the technical advisers to local authorities (Peters, 1996, p. 405-406). In the water sector, this could mean that a substantial part of the current District Water Offices' (DWOs) technical personnel would be transferred to local authorities that would take increasing responsibility for the ownership and management functions of urban water systems. Presently DWOs should support district-wide development plans. The demand-responsive approach has caused a situation which is not adequately controlled and coordinated.

Regional co-operation

According to the reform plans, there will be 6-8 Water Services Boards (WSBs), which are to be arranged largely according to the boundaries of river basins or catchment areas. A WSB can contract one or several WSPs in its area to produce services for customers. Thus, the new arrangements provide opportunities for regional co-operation. Subsequently, there may be several consolidated water utilities covering several municipalities. Inadequate professional human resources in the sector would support establishment of administratively large operational units. However, the benefits of economies-of-scale can also be attained through other arrangements than establishment of large consolidated water utilities based on the neoclassical concept of efficiency (Chapter 3.4). In reality, viable and efficient operation of water services sets reasonable limits for the appropriate size of water utilities. WSPs and/or their owner organisations could also apply other alternatives of regional co-operation based on experiences from other countries. Although there is no culture of regional co-operation between water utilities in existence in Kenya yet, various alternatives should be examined, tested and the feasible options promoted.

Customer orientation

As pointed out in Article IV, Kenyan water utilities have not in the past been especially customer-oriented in the past. The new strategies, the proposed reform plans and the Water Act 2002 do not seem to address customer interests specifically. The possibility customers have of making appeals concerning water service issues or water resource issues (Figure 5.11) does not yet represent real customer-orientation. Thus, there is the risk that the new water service providers will not be any more customer-oriented than the old ones. Customer issues should be given more attention in the reform process. Water utilities should start adopting appropriate service quality indicators (Article IV; Chapters 3.4.3 and 4.2.4) as the first step towards improving their customer-responsiveness. Customers' views should be adequately considered when designing model contracts for service delivery between WSPs and customers. Customers' rights should be adequately protected through appropriate legislation, and provisions should be made to, for instance, appoint a Consumer Ombudsman to deal with water services issues as shown in the recommended institutional arrangements in Chapter 7 (Figure 7.2).

The mentioned points of concern in the present reform implementation plans could still be adequately considered and subsequent improvements made during the implementation process. The diversity of the problematic areas of the reform process clearly indicates the need for a more participatory, interactive and visionary approach in reform implementation. In addition, further impediments could be avoided by studying the lessons learnt by other countries that have reformed or are in the process of reforming their water services sector.

5.4.3 Lessons from water sector reforms in other countries

As described in Article I, many countries have implemented or are presently carrying out water sector reforms. In some countries such reforms have been successful while in others they have more or less failed due to various reasons. Some information about the successful and less successful experiences was collected through the Delphi survey (Chapter 4.2.1). Relevant experiences from Finland, Kosovo, South Africa, Uganda and Zanzibar are discussed in the following in order to provide useful lessons to be applied in further reform of the Kenyan water sector.

These cases were selected due to their relevance based on experience and empirical evidence. The author has personal experience from water sector reforms in Finland, Kosovo and Zanzibar. The Finnish legislative and administrative reform is an example of good governance and could provide fruitful guidance to completing the water sector reform in Kenya. Kosovo and Zanzibar have met similar difficulties as Kenya in their reform processes and their experiences could help Kenya prevent repeating their mistakes. On the other hand, South Africa has successfully implemented its water sector reform and could provide encouraging examples in an African context. Uganda, being Kenya's neighbour, could also share its experiences from the reform, which had both its success and failure elements.

Finland. Finland has recently renewed its legislation related to the water and environment sector, including amendment or enactment of several interrelated acts. This new legislation affects significantly the working environment and the development and management of water services. The European Union (EU) Water Framework Directive (2000/60/EC) changes the prevailing Finnish legislation on water use and protection and environmental administration and its application. Regulations concerning environmental degradation are provided in the new Environment Protection Act (86/2000). The Water Services Act (119/2001), which is based on the EU Water Framework Directive, contains provisions on the organisation of water supply and sewerage as well as water and sewerage works and rates. The Water Services Act clarifies the liabilities of the municipality – currently there are 446 municipalities – and sets a general obligation for municipalities regarding the provision, that is, the enhancement and development of water and sewerage services in their jurisdiction (MAF, 2001).

The Water Services Act does not stipulate in detail the roles and responsibilities of the different control authorities which means that their powers are general and based on the statutory powers of the respective authority (the Regional Environment Centre, the municipal health protection authority and the municipal environmental protection authority). The water and sewerage utility – currently there are about 2000 including both water and sewerage utilities – is responsible for the management of services in its area of operation within the municipality's territory in accordance with the needs of community development (MAF, 2001).

The goal of the new legislation is, among other things, to improve the performance of water and sewerage utilities, especially as regards economic performance, customer services and health and environmental protection. That will increase the pressure to improve management culture and practices of the utilities in Finland as discussed in Article V.

The recent trend in Finland has also been to commercialise municipal water utilities and to promote regional (supra-municipal) co-operation. Reasonable consolidation and rationalisation of smaller water utilities is necessary, and this trend is likely to become stronger in the future. Privatisation and private operation of water utilities will not become a very common option in Finland, although municipalities are increasingly considering delegating service production to private companies. On the other hand, incorporation of municipal and regional water utilities will also increase.

The reform in Finland could provide at least the following important lessons for Kenya:

- i) Finnish legislation and other institutional arrangements factually separate the essential roles of policy making, licensing, supervision, regulation, water resources management, and service production and provision. In addition, separate laws govern

water rights and water resource management issues (Water Act) and service provision and production (Water Services Act). Kenya could readjust its institutional arrangements in accordance with the Finnish conception of good governance.

- ii) Water legislation can be fairly lenient with the aim of providing an enabling environment, as long as enforcement and compliance are adequately ensured. The Water Services Act is an example of such a lenient act.
- iii) Adequate integration and consistency of various laws is important. For instance, the provisions of health and environmental protection legislation should support, not contradict, the water act's provisions.
- iv) The good experiences from autonomous and incorporated municipal water utilities in Finland should be considered more seriously in Kenya. Despite the earlier problems with poor performance of municipal water utilities in Kenya, adequately reformed and autonomous public enterprises could yet be a more viable option than privatised utilities.
- v) Outsourcing of various non-core services to the private sector – as is extensively done in Finland – could be a potential form of gradually building the capacity of the private sector in Kenya. No substantial current private operator potential exists in Kenya, but there are a lot of private enterprises that could provide various services to public water utilities.
- vi) Finland's promising experiences from regional co-operation between water utilities – without necessarily merging smaller ones into large ones – could be explored more with a view to their application to Kenya.

Kosovo. As described in Article V, Kosovo is also undergoing a major reform in its water and environment sector. In Kosovo the water sector reform process reflects the overall impacts of a massive United Nations interim government. As part of the intended reorganisation of the water services sector, the policy trend pushed by the Kosovo Trust Agency (KTA) and major ESAs seems to be excessive consolidation of water services production. Instead of the present 32 municipal water utilities the future plans aim at having only 4-6 larger utilities. Some experts would even prefer to have only one large utility for the entire province.

Some of the key lessons from the ongoing reform process of Kosovo for Kenya could be the following:

- i) Policy, management and institutional options should not be aggressively pushed from outside. Local stakeholders can be effectively committed to reforms only if the entire process is participatory from the beginning. In Kosovo, the reform content was first decided and implementation started without adequate involvement of and full consultation with all key local stakeholders. They were allowed to comment the reform plans only when they were more or less completed.
- ii) The adequacy of trained and skilled sector professionals may not have been given enough attention in Kosovo. Very few local water sector professionals have had modern technical and management education as explained in Article V. Knowing the extensive and challenging tasks proposed for the restructured water sector organisations in Kenya, HRD and capacity building at various levels should be given high priority.
- iii) Municipal democracy has been awakening in Kosovo. Instead of the current reform plans that eventually aim at handing over management of consolidated water utilities to foreign or multinational private operator companies, the present municipal water

utilities should preferably be reorganised and strengthened. Similarly in Kenya, reforming and improving the performance of water utilities owned by the local authorities should be given priority over foreign private water service operators.

- iv) Ownership of water utilities has been left fairly open. The Kosovo Trust Agency (KTA) acts as a custodian of assets, but future arrangements are not clearly defined. This seems to resemble the proposed Kenyan situation with WSBs acting as asset custodians. Ownership should be clearly defined at an early stage of the reform.

South Africa. The South African reform process has in general been considered successful, as indicated in Article I and by the Delphi surveys (Chapter 4.2.1). As a continuation of the policy, the South African government has approved a Strategic Framework for Water Services (DWAF, 2003) to deal with matters such as service coverage and quality, role of various government spheres and the need for compassionate local government. The new framework deals with a range of issues based on the experiences from the provision of water services since 1994 when the Department of Water Affairs and Forestry (DWAF) published its White Paper on Water Supply and Sanitation.

The key lessons from South Africa for the reform process of Kenya could be the following:

- i) Better inclusion of sanitation, since the Kenyan reform still seems to be rather vague about sanitation – especially rural sanitation. Urban sewerage has now been incorporated better than in the original policy (1999), but other aspects of sanitation remain weak.
- ii) The South African water policy reform also puts a lot of emphasis on water conservation and demand management strategies, especially in the latest amendments to the new strategic framework. Since Kenya will face a critical stage of water scarcity in the future, demand management and effective water use cannot be emphasised too much. Water use priorities need to be given attention. Although agricultural water use is important for food production and its quantitative share is the largest, domestic water use should be secured as the highest priority.

Uganda. In the late 1990s, Uganda initiated a water sector reform programme involving decentralisation and liberalisation and a general move from projects to programmes. With these changes, the roles of the central government changed to include policy formulation, setting standards, regulations, developing capacities of local governments to deliver services and formulation of guidelines. The roles of districts have also changed: they now focus on planning and budgeting.

The Ministry of Water, Lands and Environment has conducted studies on reform in rural water and sanitation, urban water and sanitation and water for production. A water resources management study is still to be commissioned. The Ministry has also developed the Strategic Investment Plan 2000-2015 for rural water supply and a five-year operational plan for rural water and sanitation (2002-07). Despite decentralisation and increased private sector involvement, NGOs remain the most active players in the planning process at the district level – identifying areas and types of interventions for which they have received donor funding. They must continue to support local participation, skills development and sensitisation to ensure the sustainability and affordability of water and sanitation initiatives (DWD, 2002).

Although some of the experts participating in the Delphi surveys (Chapter 4.2.1) considered the water sector reforms in Uganda a failure, it has been quoted as being exemplary in the African conditions due to its substantially local origin and leadership, and

its participatory nature (A. Robinson, 2002). Thus, the key lessons from the reform process of Uganda for Kenya could be:

- i) It is important for ownership that the reform process is strongly led from the beginning by the government of the country and not dominated too much by external experts or ESAs.
- ii) The reform process should be as participatory and interactive as possible from the beginning. This enables adequate commitment among stakeholders at all levels and appropriate integration of water sector reform activities with other sectors – full recognition of the poverty reduction strategies and other related initiatives.

Zanzibar. In Zanzibar, earlier attempts at water sector reform largely failed as described in Articles I and III. The biggest impediments to policy formulation and subsequent reform implementation were political, although other severe constraints were also met (Articles I and III; Chapter 4.2.1).

Some of the key lessons from Zanzibar for the reform process of Kenya could be the following:

- i) Political facilitation and adequate advocacy and awareness among decision makers should always be given a lot of attention in the early stages of the reform process. Yet, political interference may affect reform implementation also at later stages at various levels, and thus has to be taken seriously throughout the reform also in Kenya.
- ii) Even appropriate and comprehensive legislation and regulations do not ensure improved performance. In Zanzibar the old regulations from colonial times were still officially enforced, but were not followed at all in practice (Article I). In Kenya compliance at the personal and organisational level is also a much bigger challenge than the regulations themselves.
- iii) Implementing financial and pricing reforms is often more difficult in rural areas where affordability is low than in urban areas. In Zanzibar it was clearly felt that substantial cross-subsidies would have been needed between the better-off urban areas and the poorer rural areas with a low revenue base. Similar challenges can obviously be foreseen also in Kenya. There is concern about how water service providers (WSPs) can be made to take this into account, especially if private operators are increasingly brought in as WSPs.
- iv) Now that the political situation in Zanzibar seems to have improved and external support agencies are returning with their assistance programmes, there may be a temptation to revert back to major investment programmes without adequate policy and institutional reforms as preconditions – as was the case at the time the Finnish assistance was terminated (Article I). The recent water sector assistance programmes financed and implemented by the Japanese, Chinese and Arab development organisations in Zanzibar already indicate this kind of trend. Kenya could also develop along the same lines if major ESAs return to the water sector with higher hopes of improved governance and democracy after the NARC government took over.

6 DISCUSSION AND REVIEW

6.1 The systemic and visionary management approach in water and sanitation development

The development of water and sanitation services in developing countries is a complex challenge – “*problematique*” – and thus requires a multi-disciplinary approach and concerted efforts between several sectors of society – “*resolutique*” – as elaborated in Chapter 3.3. The Millennium Development Goals (MDG) comprise a set of multi-sectoral challenges for both developing and developed countries. The policies and strategies meant to achieve the global and national goals of water and sanitation development have evolved over the last decade to consider this need for a holistic and multi-sectoral approach (Article I; Chapter 4.2.1). Integrated water resources management (IWRM) has introduced a more comprehensive approach and practical management tools for implementing these policies in practice, but is yet only one step in the integration.

The water and sanitation services sector is in a dynamic state of change globally. The main drivers of change and emerging trends were discussed, for instance, in Article V (Maxwell, 2003; Westerhoff, 2003). There have been several efforts to develop global and regional visions, scenarios and frameworks for action in the water and sanitation sector. These visions, such as Vision 21 and the World Water Vision, have provided a good basis for understanding the global challenges and substantially increased the knowledge base for the important advocacy work among top decision-makers. The process has led to a series of sectoral mega-forums that have raised public recognition of global water and sanitation challenges to a new level. However, the sustainability of the practical results in improving water and sanitation services in developing countries has so far remained modest.

As indicated in Article III and Chapter 4.2.3, financial constraints are severely limiting successful achievement of targets. Concerted mobilisation of resources and new innovations in financing are needed. One of the biggest mega-trends is increased privatisation and private sector involvement in water and sanitation services. As discussed in Article II and Chapter 4.2.2, this is not a new phenomenon at all. However, it regained popularity among policy-makers in the 1990s, when it was argued that the private sector can correct the inefficiencies of public water utilities and bring in substantial new investments after many public organisations faced financial resource crises (Hukka and Katko, 2003b). The fashionable admiration of the private sector is another reason for a long-term visionary approach to water management. We should be able to look much further ahead, beyond short-term “panaceas”. There are several alternatives for improving the efficiency, effectiveness and viability of water utilities (Chapters 3.4 and 4.2.2). Institutional and management options should be designed to suit local conditions, and a diversity of options allowed, since there is no universal best practice – especially when dealing with the overall development of the WSS sector and not only with arrangements of service production.

As described in Chapters 3.5 and 4.2.5 and Article V, water utilities and other water service organisations have so far been rather conventional and conservative in their management and leadership practices. They have mainly concentrated on operational and strategic management. There are several reasons why water utilities need a proactive long-term approach to their management and operations, as pointed out in Chapter 3.5.2 and Article V.

It is much more demanding to successfully implement water and sanitation policies and strategies than to merely formulate comprehensive policies. A number of impediments to

policy implementation, as discussed in Article I and Chapter 4.2.2, need to be adequately considered and strategies designed to cope with these impediments. A visionary approach to water management is also needed to proactively prepare for uncertainties in the policy implementation and future changes in the operational environment. Alternative development paths and possible impacts of the reform process can be “simulated” using scenario processes and a combination of relevant futures research methodologies. Experiences from such an integrated approach to the water sector reform process in Kenya, applied in Chapter 5, prove that there is a lot of potential for a visionary management process in similar reform processes in other developing countries. It is also applicable to the long-term strategy processes of water utilities.

6.2 Implications for future development co-operation and reforms

Most multi- and bilateral donor organisations apply methodological processes in project planning and preparation, such as logical framework analysis (LFA) (NORAD, 1990). This method has made project planning more systematic and standardised, which makes it easy and logical for both donor and recipient organisations to monitor and evaluate interventions. However, no systematic methodologies have been applied in project implementation. Although LFA is an analytical, target group- and objective-oriented tool for participatory planning and administration of projects, it does not really provide a perspective of alternative development paths that may require different strategic decisions and actions.

As elaborated in Chapter 3.6.5, in hard systems thinking the world consists of various interactive systems, some of which do not function well and can, therefore, be modified to function better. LFA is based on this type of hard system thinking and does not apply well to solving the problem situations of human activity systems, which involves consideration of people and their activity culture. LFA is well suited, for instance, for preparing a project document after the project has first been formulated through, for instance, a scenario working process. Especially in project preparation it is important to carefully consider the different alternative development paths and futures. With the use of futures research methodologies uncertain futures can be explored and alternative ways of action found.

The essential benefit of applying the futures research approach and methodologies in project implementation is that while studying the alternative futures learning is advanced, that is, we can observe the forthcoming consequences of implementing a project in a certain direction. By applying, for instance, the visionary scenario process (VIS) the uncertainty related to the future can be better managed, although it can never be fully eliminated (Article V; Chapter 3.6.6). Because the future cannot be reliably predicted, alternative manuscripts or scenarios for the future are prepared. The quality and usefulness of the scenarios depends on whether they can create new thinking and action (Chapter 3.6.3).

Futures research methodologies and tools could be used to complement the traditional project cycle in order to take these issues into account. Figure 6.1 shows an example of how futures research tools could be integrated into the cycle and applied at various stages of the project cycle.

The Finnish Ministry for Foreign Affairs (MFA) is increasingly moving from “fragmented project support to holistic sectoral development programmes”. Broad sector development programmes require a systemic approach to problems (Article I). The traditional project preparation guidelines and processes of MFA are no longer an adequate response to these increased challenges. A systemic and visionary approach utilising the futures research

methodologies would offer valuable tools also for the planning and implementation of new sector-wide development programmes.

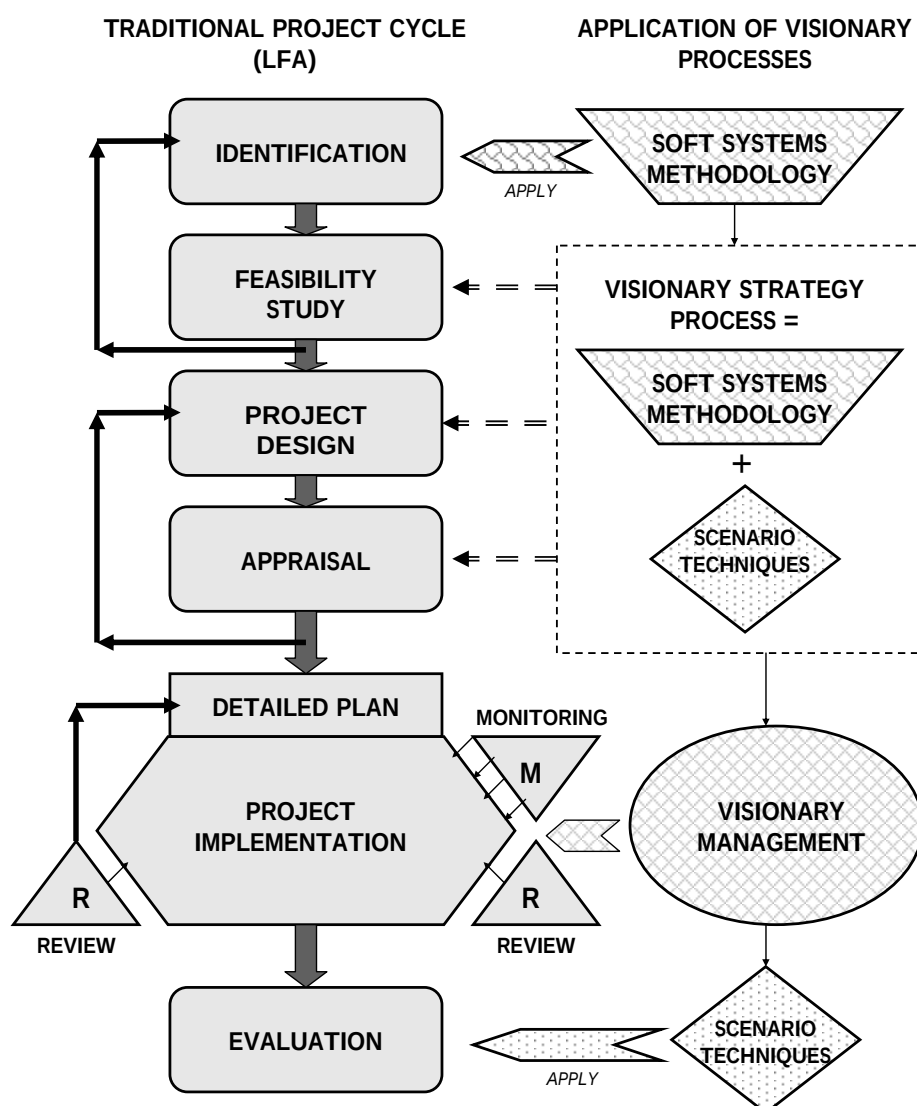


Figure 6.1 Proposed application of futures research tools to the development project cycle (modified from MFA, 2000, p. 10).

As concluded in Article I, assessment of the impacts of water policies and institutional reforms is difficult – due to the complexity of the operational environment which typically consists of soft human activity systems. Methodologies and approaches commonly applied, for instance, in environmental impact assessment (EIA) are not readily available for assessing the future success of policy and institutional reforms. Futures research methodologies – such as scenario techniques and the soft systems methodology – can be modified and used as tools for *policy impact assessment (PIA)* and *institutional impact assessment (IIA)*. A combination of soft systems methodology and scenario techniques enables us to decipher alternative futures and prepare for uncertainties in the impacts of reforms. This approach was tested in the case of the Kenyan water sector reform process and was generally well received by the key officials of the process and experts participating in the visionary process.

This visionary approach – ISSP as elaborated in Chapter 3.6.6 and Article V – could be incorporated into the *integrated assessment approach (IAA)* described by van Asselt (2001).

6.3 Assessment and self-evaluation

Importance, complexity and diversity of the research topic

Judging by the wide international discussion about the huge global challenges of securing access to safe water and improved sanitation services to all people, the research topic is undoubtedly very important. Yet, despite the significance of the topic and problems, little inter-disciplinary research has been carried out – especially from the infrastructure's point of view. The research topic was broad and complex which made it a challenge to find the appropriate focus for the dissertation. An inter-disciplinary knowledge base and an understanding of the diversity of the scientific disciplines relevant to the topic were required. The problem situation is complex and diverse, which made definite problem and context formulation one of the most difficult tasks. It was felt necessary to review and analyse a diversity of theoretical considerations on various issues (Chapter 3) to adequately understand the complex problem situation and create an inter-disciplinary approach. However, theoretical considerations and the literature review of Chapter 3 cover only part of the issues that had to be studied for the dissertation and this synthesis report. The theoretical analysis consolidated in the synthesis is mainly related to the issues discussed in the Original Publications – which are related to the identified five key elements of the research – and support the case study of Kenya in Chapter 5.

The research paradigm and the scientific approach are likely more hermeneutic than positivistic, posing a challenge to a researcher with an engineering background – though with futures research skills – in an academic community where the positivistic research approach strongly dominates. The hermeneutic approach also led to most of the research data and analyses being more qualitative than quantitative. This, again, caused some difficulties in results verification and replication. For instance, the results of the Delphi surveys may not be fully reproducible in reconstructed research. The tacit nature of expert knowledge is rather dominating, and it is difficult to extract enough tacit knowledge in expert surveys although tools such as Tacitix have been developed. The hermeneutic nature of this research also meant that value judgements and ethical considerations could not be avoided, although they are usually banned in positivistic research.

The inter-disciplinary nature of the topic affected the selection of methodologies, which eventually consisted of a combination of various quantitative and qualitative methods. The selected methods commonly utilised in futures research were found most feasible, especially the Delphi technique, scenario techniques and the soft systems methodology.

Applicability of futures research methodologies – particularly SSM

Futures research epistemology and methodologies was found to be the best available scientific foundation for addressing the complex and somewhat fuzzy problem situation. However, the huge uncertainties related to futures make it challenging to apply an analytical and scientific approach. The complex human activity systems related to water and sanitation services in developing countries are difficult to truncate to a manageable “system model” that can be analysed by the soft systems methodology (SSM). The SSM process was applied in the case study of Kenya, although not in its most comprehensive form. The core definition should essentially describe the transformation process itself (Checkland and Scholes, 1999; Schubeler, 1996), which was a challenge in Kenya's complex institutional environment. Although the CATWOE process is the most commonly used process in developing the core definition, it does not always produce the expected results (Schubeler, 1996). The VMAR process – in this dissertation a modified VisMASST process – is more suitable for constructing the core definition and system description of an

organisation under pressure to change. In the VMAR process the situations of the system are described in a cross-sectional manner at certain moments. VMAR fulfils better the continuity conditions of the formal system than CATWOE, which is more of a streamline type of approach based on a single event (Keskinen, 1999, 2002; Rubin, 2002, 2003a).

Applicability of the Delphi technique

The Delphi technique was useful in collecting and analysing expert views on the key elements of the research and in testing the hypotheses presented in the articles. In practice the use of the Delphi technique was reduced from the original plans. Participation of experts in the Delphi surveys was much lower than expected, especially in surveys on topics that were not among the most “fashionable” ones (such as financing, customer-orientation, and visionary management). Despite several reminders only a few experts participated. There may have been several reasons for the low participation and commitment. Invited experts were the most knowledgeable experts on these topics, which also makes them extremely busy. Anonymity of the experts is usually claimed to be an essential feature of Delphi surveys, but the author’s experience is that many top experts may be more interested in participating in conventional conferences and e-conferences, where their expertise is openly exposed, than in such personal and “low status” surveys as the Delphi surveys of this dissertation. Because of the low participation in the first Delphi surveys, it was considered unfruitful to carry out several iterative Delphi rounds in the manner that comprehensive Delphi studies require. For the same reason, the Debatix argumentation sessions following Delphi surveys were used to a very limited extent. The originally planned large Delphi panels were partly replaced by smaller e-mail discussion groups and personal interviews of experts, which were found useful although expert feedback thus remained less quantitative than expected.

Applicability, limitations and problems of the scenario process

Experiences from visionary processes integrating scenario techniques and strategy development were positive and confirmed the need to further develop and apply this process in water services organisations. However, the process should ideally be applied in a more intensive and interactive manner. The experiences from Finland – for instance with the South-West Regional Environment Centre and the municipalities in the area (Elomaa et al, 2002) – clearly showed that the participants and clients should commit themselves more steadfastly to the process and use their local knowledge and creativity more. Process facilitators should not be responsible for producing most of the ideas and ingredients for the scenario and strategy process which often seems to be the case.

Visionary process applied to Kenya’s water sector reform

Experiences from the visionary process applied to the Kenyan water sector reform were good, although the process was too concise due to time and resource limitations. Yet, it showed the potential and applicability of an integrated scenario and strategy process in ensuring that all uncertainties and impediments to reform implementation can be adequately addressed at an early stage of the process. Participants of the visionary process in Kenya were satisfied with the approach and commented that visionary tools and processes should have been incorporated into the reform process from the very beginning. The water sector reform process in Kenya as such has been carefully planned and professionally led. The main concern is whether the implementation of the reform and its real impacts on sector performance will be successful. Good intentions and plans do not help, if business-as-usual continues and individuals and organisations do not substantially change their old attitudes, working styles and procedures.

Limitations of data reliability

There were limitations on the amount of reliable quantitative data on the case study countries that could be obtained. The water sector data, for instance in Kenya, was largely unreliable and difficult to verify due to inadequacies in local data collection and knowledge management processes. Verification of data through comprehensive field tests and missions was not possible, although some efforts were made during field visits connected to the author's involvement in development co-operation projects in Kenya and Zanzibar.

Achievement of objectives

The objectives of this research (Table 1.1 in Chapter 1) were diverse and challenging. In general, objectives were met fairly well and results were satisfactory. Resource limitations – especially time and funding – affected some of the planned key activities, such as carrying out the visionary process in Kenya and testing of the findings of the articles and synthesis report among a wide expert base. Experiences from the Internet-based Delphi studies were to a large extent discouraging due to low participation and commitment of invited experts.

The positive experiences from the visionary process applied to the water sector reform in Kenya proved the feasibility of futures research methodologies also in practical problem solving related to complex human activity systems. Most of the nine basic tasks of futures research as defined by Bell (1997) – described in Chapter 3.6.1 – were to some extent experimented with in practice and utilised in the Kenyan case study. Especially the last two tasks related to the role of futures research in assisting stakeholders in participative and proactive decision making by unveiling alternative future development paths were well demonstrated.

6.4 Dissemination and utilisation of results

The results and findings of this research can be utilised in several ways to improve the conventional approaches to water and sanitation sector development. Proactive visionary assessment of the implementation and impacts of development projects and reform processes, as described in Chapters 6.1 and 6.2, is the most important and potential way. This approach and methodology would be worth introducing and advocating to various development agencies.

The ideas and findings drawn from the visionary process applied to Kenya's water sector reform could be further utilised by Kenyan water sector professionals and decision-makers during the ongoing reform process to improve its quality. In particular, the weaknesses and inadequacies of the proposed institutional arrangements could be constructively addressed through appropriate dissemination of the results.

The proposed *integrated scenario and strategy process (ISSP)* is an applicable and important approach for both policy-making organisations and water utilities. Its benefits and requirements for further refinement should be communicated to interested water sector organisations and particularly water utilities.

The results will be utilised and exchanged within ongoing European Commission funded research projects – such as PRINWASS and WATERTIME – on decision making and management of water services in developing countries and Europe.

7 CONCLUSIONS AND RECOMMENDATIONS

7.1 Conclusions and recommendations

Water and sanitation services are essential basic infrastructure and recognised nowadays as basic human rights. Yet, nearly 20 per cent of the world's population lack access to safe and improved water supply and about 40 per cent lack access to improved sanitation services. Water and sanitation problems are significant especially in the poorest developing countries. Solving the problem requires vast but not insuperably difficult to procure financial and human resources. Despite the seemingly simple technologies, water supply and sanitation services comprise a complex social human activity system.

This dissertation produced the following **key conclusions**:

Complex problems can best be solved by a **systemic multi-, inter- and trans-disciplinary approach**. The **soft systems methodology (SSM)** is a useful tool for handling the complex problems of human activity systems. There have been several global initiatives to address water and sanitation problems in developing countries, while sustainability of practical results has remained modest. Water services management requires very long-term considerations. In the future its complexity and uncertainty will continue to increase – therefore a **visionary approach** is needed. Various global visionary processes have successfully addressed future challenges and uncertainties, but they have not been able to trigger the required concrete world-wide action to solve the problems. This research aimed at **incorporating selected futures research methodologies and visionary management as an integral factor in the water services management and reform process**.

Although the problems are reflected in various practical ways – such as inadequate service coverage and quality, and poor operation of existing water systems – many of the water and sanitation sector's **problems are rooted in inadequate institutional and management arrangements**. Scientific research on the institutional development of water and sanitation services is still inadequate and poorly linked to the bulk of the practical action in the field.

Many developing countries are presently undergoing or planning substantial policy and institutional reforms in their water sector. Often these reform processes are to a large extent driven by foreign experts and donors. International water policies and strategies have in the past concentrated on a few fashionable aspects instead of being holistic and comprehensive. Consequently, the policies of developing countries usually follow the same fashionable trends. Instead, a **systemic approach to policy reforms** is needed, and reforms should always be tailored to local circumstances.

Integrated water resources management (IWRM) is a remarkable step towards an integrated and holistic approach to water management, but the practical complexity of water sector problems requires an even much broader approach to societal interactions. Fragmentation of water sector institutions and organisations is pronounced in many developing countries, but inter-sectoral collaboration is necessary for the success of water sector reform implementation. Reforms should effectively address all levels from national and even trans-national policy making to the local user and the household. Often reforms concentrate too much on the upper level and emphasise policy, legislation and administrative changes only. Therefore, water and sanitation services sector **reform should include specific strategies for both the “policy level” and the “utility level”**. Institutional and organisational arrangements, financial and human resource provision and capacity building programmes should thus be appropriately designed to cover all levels in a balanced manner.

Reform processes involve many uncertainties and, especially in developing countries, they often fail due to various impediments to implementation. This research emphasised the use of the **visionary management approach and appropriate futures research methodologies** to reveal uncertainties and to provide alternative strategies. The main purpose of the selected futures research methods – such as the Delphi technique and scenario techniques – should be to **assist stakeholders in the reform process and decision making as well as in assessing the potential impacts of reform**. These futures research methods combined with established strategic management methods and visionary leadership provide a novel visionary management approach to water services management, which is needed both at the **policy-making and water utility levels**. Here, this approach is called the **integrated scenario and strategy process (ISSP)**.

Figure 7.1 summarises the author's view on how the scientific basis of this dissertation – including theoretical considerations in Chapter 3 as shown in Figure 3.1 – and selected futures research methodologies can be utilised to assist decision making and strategic management both at the policy and utility levels (Figure 3.2) in the water sector reform process.

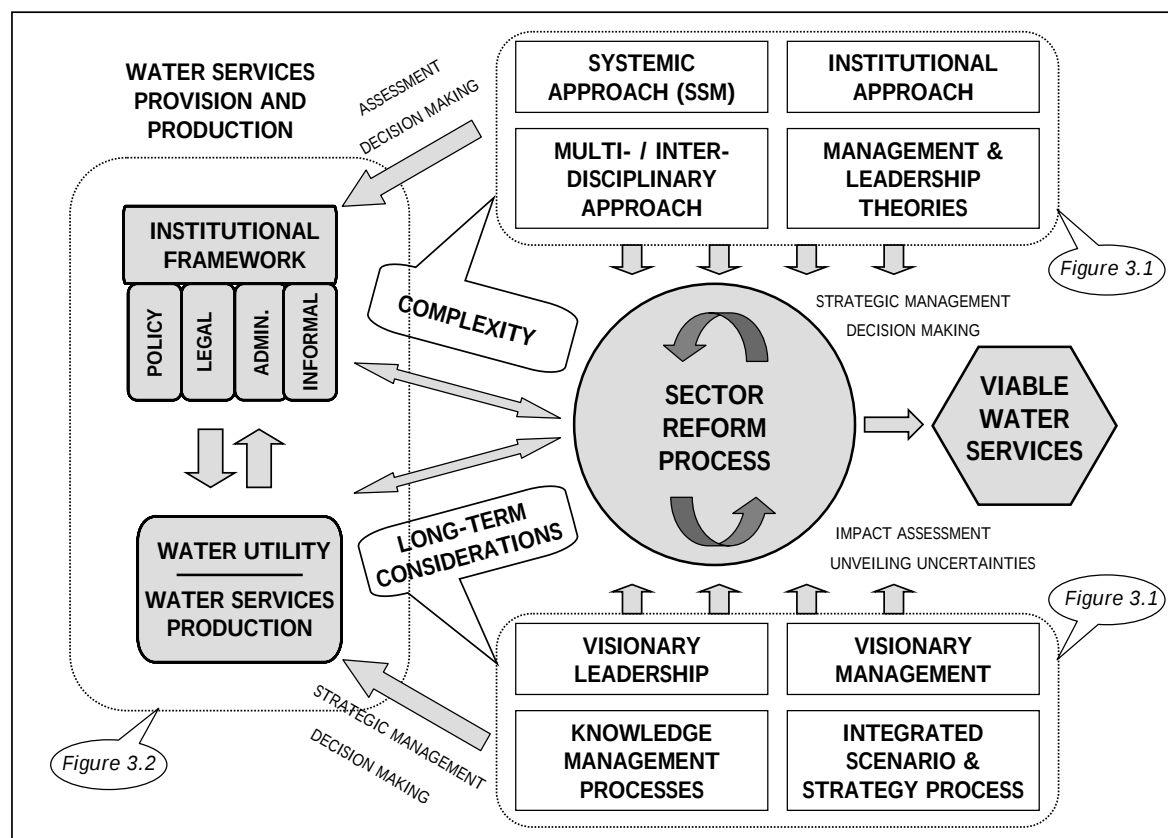


Figure 7.1 Visionary management approach for the water sector reform process.

The ISSP was proposed and tested in connection with the **water sector reform process in Kenya**, which has been professionally planned and led as such. Yet, the intended clarification of the roles of the Ministry of Water Resources Management and Development (MWRMD) – and the important separation of water resource management and service provision and production – seems to make the reform inadequate. The MWRMD and, especially the Minister, still retain ultimate power over all new agencies that should be independent. Another main concern is whether the implementation of the reform process and its real impacts on sector performance will be successful. Good intentions and plans do not help, if business-as-usual continues and individuals and organisations do not substantially change their prevailing attitudes, old working styles and

procedures. Yet, the experiences were positive, and a similar approach would be beneficial in proactively assessing the impacts of institutional and reform processes elsewhere. Futures research methodologies and visionary processes should also be utilised more in project identification, preparation and planning by development co-operation agencies.

Based on the findings of the visionary process and an analysis of the water services reform in Kenya, the following **modified structure** is recommended for the water services' institutional framework and organisational arrangements (Figure 7.2). These arrangements would better ensure good governance and the independence of licensing, regulatory and supervisory bodies than the structure introduced in the reform plan.

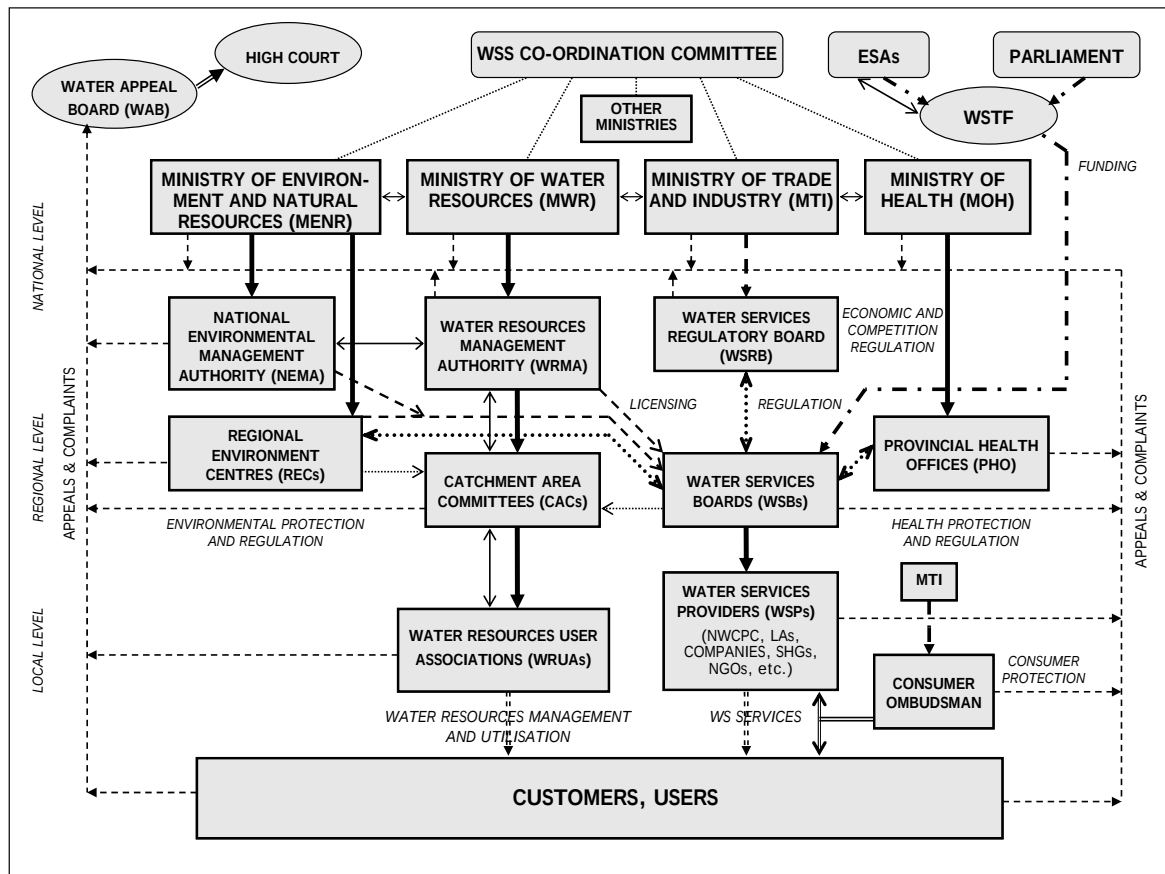


Figure 7.2 Recommended future organisational structure for the water services sector in Kenya.

7.2 Need for further research

Based on the results of this dissertation, the need for further research in the following areas was identified:

◆ Wider application of futures research methodologies in the water services sector

So far, futures research methodologies have rarely been applied to water services compared to other social and infrastructure sectors. The findings of this dissertation confirm the applicability of, for instance, the Delphi technique, scenario techniques, and the soft systems methodology to the water services sector. Scientific research results and sector specific applications can be accumulated through increased research inputs in methodological development. Technology forecasting and foresight studies on the water services sector can provide valuable outputs, for instance, for development of technologies and applications to cope with the increasing vulnerability of the water infrastructure. External support agencies (ESAs) could start applying futures tools in combination with the prevailing logical framework approach (LFA) in their development interventions.

◆ ***Visionary process and institutional change in reform implementation***

Experiences from the application of the integrated scenario and strategy process to Kenya's water sector reform were positive, although the case study was of limited scope and duration and should thus be continued. The commitment and interaction between local stakeholders in the visionary process is essential and requires improvement. Therefore, it is recommended that additional visionary workshops be arranged during the ongoing reform process for the key stakeholders. The preliminary work done by the author in this dissertation would thus be expanded into a comprehensive visionary process to assist Kenyan water authorities in preparing a strategic development programme for water services management. The process could also be applied more elaborately to other cases while experiences should be adequately documented to provide proper guidelines for reform facilitators in developing countries. Also, the key factors affecting institutional change during the reform process should be more closely studied in connection with selected reform case studies.

◆ ***Identification and creation of the visionary and knowledge management framework needed in water and sanitation services management in the future***

Knowledge management (KM) provides an essential platform for supporting decision making and management in water utilities. KM should be adequately integrated with the operational, strategic and visionary management of water utilities. Experiences from the case studies and the findings of Article V suggest further development of the visionary and knowledge management framework particularly within water utilities. The preliminary survey included in this dissertation should be continued to study current management practices of water utilities in more detail. The potential of applying the proposed ISSP approach to selected pilot water utilities should be studied further.

◆ ***Identification and conceptualisation of the ontological and epistemological foundations of viable water and sanitation services management***

Fashionable and neo-liberal policies presently widely support the idea that water and sanitation services and infrastructure are very similar to any other infrastructure sector – such as energy, electricity, telecommunications, and transport – and could thus be reformed and restructured along the same lines. However, water supply and sanitation have their special and specific features including environmental, health, social, ethical, equity and gender dimensions that should be addressed in the reform process. There is a need to carry out scientific research on the specific features – “ontology” – of WSS services to provide stronger evidence and arguments for the reform debate.

◆ ***Regulation of water and sewerage services***

The need for regulation is always emphasised in water sector reform processes, but is not often adequately elaborated. In response to increased private sector participation, the need for economic regulation is usually addressed. However, there is a need for various components of regulation – economic, environmental, water quality, technical, service quality, business operations, and assets management – which are often undermined. Regulatory arrangements in reform processes often focus on the central (national) level, although regional and local level regulatory arrangements may be equally important. There is a need to carry out scientific research on the appropriate regulatory arrangements and framework for developing countries, keeping in mind their limited local resources. The case study of Kenya showed that the essential independence of licensing and regulatory authorities is not always adequately conceptualised.

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TERMS AND DEFINITIONS

Accountability	Responsibility to account for actions. In economics, relates to standards of reporting the costs and benefits of actions to the principals of an organisation (Kasper and Streit, 1998, p. 303).
Adaptive efficiency	Box 3.4. Concerned with the kinds of rules that shape the way an economy evolves through time. Provides the incentives to encourage the development of decentralised decision-making processes that will allow societies to maximise the efforts required to explore alternative ways of solving problems (North, 1990).
Allocative efficiency	Box 3.4. Component of efficiency that deals with allocation of resources through prices, markets and administrative interventions (Israel, 1987). Producing the maximum output possible, given quantities of inputs and using cost-minimising techniques of production (Todaro, 1999).
Asset	Any tangible or intangible possession of resources which has value.
Asset specificity	Specialised physical facilities and human assets lose their value in other activities, because they can only be utilised for their specific purposes. Water supply infrastructure is typically asset specific.
Asymmetric information	A situation in which the agent acting on behalf of the principal has better knowledge about the operation than the principal (principal – agent theory) (Kasper and Streit, 1998, p. 67).
Benchmarking	Comparative technique by which an organisation tries to emulate or exceed standards achieved or processes adopted by another organisation.
Bounded rationality	Cognitive limitations to make decisions based on incomplete information.
CATWOE	Customer – Actors – Transformation – Worldview – Owners – Environmental Constraints. A method to prepare core definition of a system by analysing the sub-systems, systemic processes and factors affecting the function of the entire system.
Charismatic leadership	Leadership by a person, who is obeyed or followed without question, on the basis of the power of the leader's personality or some other attributes.

Commercialisation	In this research: Application of commercial operational principles in public organisations.
Complexity	An obscure entity consisting of different components, elements and chains of events, which is difficult to conceptualise, analyse or solve (Vapaavuori and von Bruun, 2003).
Core competence	Combination of knowledge and skills that an organisation considers its strong business areas and is doing well compared to its other internal activities.
Core definition	Describes the components of a system and functions of a system (present situation).
Core vision	Describes the future situation of a system: how the system would be in the future and what its purpose would be.
Corporatisation	Incorporation. Transferring a public organisation into a public company.
Cross impact analysis (CIA)	Qualitative matrix method of forecasting, or a method of revising estimated probabilities or impacts of future events in terms of estimated interactions among them.
Customer-orientation	A management approach or philosophy in which the customer is central to everything that the company or organisation does.
Decision support system	System used by management to aid decision making on unstructured, complex, uncertain or ambiguous issues.
Delphi	A group problem solving and forecasting technique based on survey of expert views, commonly used in futures research.
Deregulation	An act of removing selective legislative and regulatory constraints or restrictions on the use of property rights, goods and services, facilitating co-ordination by market forces (Kasper and Streit, 1998, p. 485).
Driving forces	Factors or phenomena that affect future development, decision making and choices in the operational environment of an organisation.
Dynamic efficiency	Box 3.4. Component of efficiency affected also by external effects such as market forces, competition, and operational environment.

Economic efficiency	Box 3.4. Component of efficiency producing the maximum-valued output possible, using cost-minimising techniques of production and considering effective market demand. Emphasises costs, but usually neglects economic and non-measurable worth / values.
Effectiveness	Box 3.3. Performance in activities that support the mission. Measures how well an organisation achieves its own objectives and goals.
Efficacy	Box 3.3. Capacity to produce a desired effect. Measures the long term impacts and sustainability of activities, that is, how they work. Describes also the relative importance of aspects.
Efficiency	Box 3.3. Performance in relation to resources available. Refers to the way in which resources are used to achieve the objectives. Measurement of the output per unit of cost. Process of maximising the productivity of inputs.
Epistemology	Science which investigates how humans gain and convey knowledge, 'theory of knowledge' (Kasper and Streit, 1998, p. 48).
Equality	The condition or quality being equal in terms of quantity, measure, value, or status.
Equity	Equality or natural justice of rights. Fairness or impartiality.
Ethics	Morale principles that govern the behaviour of individuals and organizations and their decision choices. The enquiry into morality (that is, what is right and wrong, and the yardsticks by which people assess what is right or wrong).
Externalities	Positive or negative external effects on third parties resulting from production and consumption activities.
Field anomaly relaxation (FAR)	Tabular collection of sectorally organised characteristics of alternative futures images.
Formal institutions	Formal frameworks through which individuals and organisations interact, such as policies, legislation and regulations, and administrative structure.
Futures image	A view or description of the future situation, a state of mind of the future, based on the understanding of the pasts and presents.

Futures matrix	A sectorally arranged collection of various futures images.
Globalisation	Process of integrating and opening markets across national borders (Gleick et al, 2002).
Governance	Exercise of economic, political and administrative authority to manage issues, comprising mechanisms, processes and institutions which citizens and groups articulate their interests, exercise their legal rights, meet their obligations and mediate their differences. Governance is a more inclusive concept than government, because it embraces the relationship between a society and its government.
Hermeneutics	Scientific paradigm based on <i>understanding</i> or <i>interpreting</i> the phenomena. Dominant in human and social sciences.
Human activity system	A purposeful system of activities in which humans are involved (typically in an organisation)
Informal institutions	Norms of moral and ethical behaviour, codes of conduct, conventions, and other informal factors that shape human interaction.
Infrastructure	Physical facilities needed to provide water and sanitation services to customers. Public works, plants and networks.
Institutions	Box 3.2. Man-made <i>rules</i> which constrain possibly arbitrary and opportunistic behaviour in human interaction (Kasper and Streit, 1998, p. 28). <i>Rules</i> of the game in a society, or <i>constraints</i> that shape human interaction (North, 1990, p. 3).
Institutional arrangements	The structured set of linked or interdependent institutions, which comprise the social system of the economic, social and political domains – and guidelines or governance structures through which decisions are implemented.
Institutional framework	The totality of institutions in which decisions are made and implemented; consisting of the institutional environment, institutional arrangements, and organisational actors (individuals, agencies, and organisations).
Institutional change	Consists of changes and new thinking of both formal and informal institutions. A prerequisite for any major reform or restructuring in a society.

Institutional environment	The background constraints that guide individual and organisational behaviour – based on both formal and informal institutions.
Institutional structure	Patterns of organisational action concerned with the formation of and transformation and change of institutions.
Justice	Fair distribution of benefits and burdens in cases that should be treated alike. Conformity to the principles of righteousness.
Legitimacy	The state of being in conformity with law. Undisputed credibility.
Megatrends	“Big waves of development” that shape society and have a certain direction of development.
Mission	Purpose of an organisation’s future action.
Moral hazard	When people act opportunistically, they fall into moral hazard. Situations where self-interested individuals are tempted to violate general standards of honesty and reliability because circumstances allow them to get away with it (Kasper and Streit, 1998, p. 67; North, 1990, p. 128).
Morphological analysis	A technique or method aiming at systematically recognising all possible means to achieve certain future goals. Often used in connection with futures matrix (FAR). (Vapaavuori and von Bruun, 2003)
Natural monopoly	A sector or technology which cannot be exposed to market competition due to its basic characteristics, such as extensively high sunk costs.
Neoclassical economics	A conventional stream of economics that emphasises rational economic efficiency and disregards the importance of institutions.
New institutional economics (NIE)	A stream of economics that emphasises the role of institutions and transaction costs in economy, and extends and modifies the neoclassical approaches. Further evolution of OIE.
Old institutional economics (OIE)	A stream of economics that emphasises the role of institutions in economic performance, and abandons the neoclassical approach. Views economic behaviour in its cultural context.
Oligopoly	Situation in the market where there is only one customer but several competitive suppliers.

Ontology	A branch of metaphysics that deals with the nature of being. Study on the basic principal nature and characteristics of a certain science or sector.
Operational efficiency	Box 3.4. Component of efficiency dealing with maximising the use of labour and capital through sound management of enterprises, projects and programmes (Israel, 1987).
Operational management	Management that focuses on the operational activities of an organisation at the present time or in the near future. Time horizon usually 1-2 years.
Opportunism	Taking advantage of opportunities without regard for the consequences for others. Action following from bounded rationality and self-interest.
Opportunity costs	Costs caused by anticipated forgone opportunities (alternatives that have to be forgone). The potential benefit that is given up when one alternative is selected over another.
Organisations	Box 3.2. Purpose-oriented, reasonably durable combinations of resources which are to some extent co-ordinated in a hierarchical way by a leadership (Kasper and Streit, 1998, p. 99). Groups of individuals bound by some common purpose to achieve objectives (North, 1990, p. 5).
Organisational memory	Mechanism that allows knowledge to be distributed and transferred over to individuals in an organisation over time and space, facilitating information transfer without loss of information and knowledge or complex new search activities.
Outsourcing	Outside resource using; buying services or using external resources instead of doing or building self.
Paradigm	A generally accepted basic theory, established assumption, perspective, or a cognitive scheme of things to explain phenomena.
Path dependence	Path dependence means that decisions made in the past are likely to have long-term impacts by binding, limiting or postponing alternative future options.
Performance indicator	A quantitative measure of a particular aspect of the organisation's performance or standard of service; used in monitoring and evaluation of the efficiency and effectiveness
PESTEL	Political – Economic – Social – Technological – Environmental – Legal. An approach to analyse

from a holistic perspective the present and future state of an organisation.

Positivism

Scientific paradigm based on *explanatory* and *describing* approach to phenomena, emphasising that explanations must be empirically verifiable. Dominant in natural sciences.

Principal-agent

A situation that arises whenever people act on behalf of others (principals), and when the agents have better knowledge about the operation than the principles (asymmetric information).

Privatisation

Transfer of property rights from collective to private ownership, and transfer of management rights from collective to autonomous private decision making. (Kasper and Streit, 1998, p. 481). Transferring some or all of the assets or operations of public water systems into private hands (Gleick et al, 2002).

Problematique

The complex and interdependent set of crucial problems – political, economic, social, technological, environmental, psychological, and cultural – facing societies and humanity.

Productivity

The ratio of the quantity and quality of units (goods or services) produced to the labour unit of time. Productivity is commonly defined in terms of labour, which is the contribution of people to a business process.

Property rights

The rights (of ownership) that individuals appropriate over their own labour and the goods and services they possess (North, 1990, p. 33). Describing the nature of the decision-making entity holding the rights pertaining to use of a resource (Challen, 2000).

Public-private co-operation (PPC)

A wide concept of private sector participation in water and sanitation services, including outsourcing various non-core activities and services from the private sector.

Public-private partnership (PPP)

A form of private sector participation in which usually a joint project company is established to finance and carry out an infrastructure investment project in partnership between the public agency and a private company.

Regulation

Supervision and control by the government or other regulatory body through set of rules over the activities of private and public businesses in the interests of societal efficiency and fairness and to control market. (Williamson and Masten, 1999).

Resolutique	An approach that necessitates coherent, comprehensive and simultaneous efforts to resolve as many as possible key problems at various levels.
Rich picture	Unstructured – often artistic and individualistic – expressions that assist in conceptualising the perceived problem situation.
Scenario	Box 3.5. “Manuscript of alternative development paths to futures”. Logically progressing chain of events that describe how a possible future situation develops step by step from the present. Describes both the state of the future and decisions and actions needed to achieve the desired future state.
Service level	Level of technology used to provide water and/or sanitation services to customers, that is, for instance hand pumps, yard taps, or house connections.
Service capacity	The ability or capacity of the service unit to produce services and to consider customers in its operations.
Service coverage	Proportion of people having access to improved water and/or sanitation services (percentage of people served compared to total population).
Service production	Technical process of transforming inputs to outputs, making a product, or rendering a service. Actual supply of water services to customers. (Hukka, 1998, p. 27; Ostrom, Schroeder and Wynne, 1993).
Service provision	Decisions made through collective-choice mechanisms to ensure that water services are provided to customers. (Hukka, 1998, p. 27; Ostrom, Schroeder and Wynne, 1993).
Service quality	Measure of quality and reliability of the service received by the customer. Measured using various service quality indicators.
Social capital	Features and resources of social organisation, such as networks, communities, norms, and social trust that facilitate co-ordination and co-operation for mutual benefit, support, reciprocity, and obligation.
Soft systems methodology (SSM)	An action research based methodology commonly used in futures research to describe and analyse transformation process of an organisation.
Stakeholders	Any group or individual who can affect or is affected by the achievement of an organisation’s objectives. Direct or indirect actors related to operation of an organisation.

Static efficiency	Box 3.4. Component of efficiency related to internal ownership effects of the organisation.
Strategic management	Management which focuses on the changes and challenges in an organisation within the long-term strategic planning period. Time horizon 3-5 years.
Strategy	A concrete systematic and stepwise plan of action to achieve the shared vision of an organisation in accordance with the mission.
SWOT	Strengths – Weaknesses – Opportunities – Threats. A method to analyse internal strengths and weaknesses, and external opportunities and threats of an organisation.
Technical efficiency	Box 3.4. Component of efficiency related to producing the maximum output possible, given quantities of inputs and existing technology, without regard to effective market demand (Todaro, 1999).
Transaction costs	“Friction of the economic system”. Additional costs related to organising any business transactions.
Transformation costs	The costs of production (North, 1990, p. 28).
Vertical integration	Arrangements to reduce transaction costs internally and aiming at reducing competition to achieve dominant market position (North, 1990, Williamson and Masten, 1999).
Viability	Box 2.1. A viable water system is defined as one that (1) is self-sustaining, (2) has the commitment, and (3) has the financial, managerial and technical capability to meet performance requirements on a long-term basis.
Vision	An active and desired future state of an organisation, based on its values and mission.
Visionary management	A participatory and prospective method of strategic management. Long-term activity that focuses beyond the foreseeable near future. Time horizon usually 10-30 years.
VisMASST	Vision – Mission – Actors – Structure – Strategy – Transformation. A method of preparing the future system description of an organisation, and linking the system description to the strategy and transformation process.
VMAR	Vision – Mission – Actors – Structure. A method of preparing the future system description of an organisation.

APPENDICES

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| APPENDIX 1: | Policy trends and main events in the evolution of water and sanitation services in Kenya |
| APPENDIX 2: | Scenarios for the alternative futures of water services in Kenya and the water sector reform process |
| APPENDIX 3: | SWOT analysis of the water services in Kenya and the reform process |
| APPENDIX 4: | Strategic development programme for Kenya's water sector reform implementation |

APPENDIX 1

Policy trends and main events in the evolution of water and sanitation services in Kenya

Time / Period	Political events and trends	Economic policy events and trends	WSS policy events and trends	Water supply	Sanitation
1895	Kenya became a protectorate of the British Empire.				
1920	Kenya became a British Colony until 1963.				
1951			Water Resources Authority (WRA) established.		
1952			Water Act (Cap 372) (1952).		
1957			Mombasa pipeline Board was established, ordinance No. 15 of the laws of Kenya.		
1962			Water Act (Cap 372) – revision (1962).	“Overall ownership of water resources is vested in the government” (Section 3)	
1963	Independence. Self Government. Kenyatta regime started.				
1963-1968	Period of first multi-party democracy.	First National Development Plan	Water Development Department established 1964 under the Ministry of Natural Resources.		
1965	“African Socialism and its Application to Planning in Kenya” (Sessional Paper No. 10)		Basic services free or subsidised by the Government. Involvement of other actors than Government minimal.	Poverty alleviation through provision of drinking water (1960s)	
1969-1973		Second National Development Plan	Water Act (Cap 372) – revision (1972). Water Development Department transferred from Ministry of Natural Resources to Agriculture. WDD took over the functions of the WRA.		
1970s		“Harambee” (pulling together)		Large number of self-help water projects initiated.	

APPENDIX 1

Policy trends and main events in the evolution of water and sanitation services in Kenya

Time / Period	Political events and trends	Economic policy events and trends	WSS policy events and trends	Water supply	Sanitation
1974			National Water Master Plan 1974. Ministry of Water Development (MoWD) as “fully fledged water ministry”.	“Ensuring availability of potable water within 4 km of every household by 2000”. MoWD domination distorted the cost-sharing principles of self-help schemes?	
1974-1978		Third National Development Plan	“Need to manage the resources for ecological, socio-cultural and economic benefits”. User charges. Rates for urban water supply and sewerage recommended to be based on full cost recovery.	Government (MoWD) taking over self-help water supplies and county council water supplies. Municipal Water Supply Programme.	Plans to develop sewerage in principal towns to reach the level of water supply (failed).
1978	Moi regime started.	Local Government Act (Cap 265), revised 1986		Establishment of Local Government Loans Authority (LGLA). Water and Sanitation Departments (WSD) in Local Authorities.	
1976-1981			National Water Master Plan (Sida)	“Sustainable management of water as a limited natural resource”.	
1981		Legal Notice No. 194, December 1981	Ministry of water development standardised water tariff throughout the country and abolished metered connections in the rural areas.		
1979-1983		Fourth National Development Plan	Policy change: “everybody should pay for water services”	“Water for all by 2000”.	
	Period of de-jure one party state (1982-1990).	Structural Adjustment Programmes (SAPs), from 1980/81	“Restoring efficiency in all sectors of economy, including water”	Attempts to restructure LGLA along the lines of municipal development bank	
1982		Sessional Paper No. 4	Government’s economic and institutional resources for water services became inadequate.		
1983		District Focus for Rural Development	Decentralised responsibility of planning and implementation from the ministry headquarters to the districts.		

APPENDIX 1

Policy trends and main events in the evolution of water and sanitation services in Kenya

Time / Period	Political events and trends	Economic policy events and trends	WSS policy events and trends	Water supply	Sanitation
1983 - 1988		Fifth National Development Plan	Cost recovery as an essential element. Reverted to the theme of the Third Development Plan. Legal Notice No. 194, December 1981 was not withdrawn until 1991 even after the publication of Sessional paper No. 1 of 1986 that introduced cost recovery in provision of social services.		
1986		Policy Framework Paper for Economic Management for Renewed Growth (Sessional Paper No. 1).	“Commercialisation of water and sanitation facilities”. Local Government Act (Cap 265) – revised.	Decentralisation of water provision to Local Authorities	
1987		GTZ/Urban water programme	Policy of assisting water undertaking Local Authorities to improve management and sanitation services. Genesis of institutional reforms.		
1988			Establishment of National Water Conservation and Pipeline Corporation (NWCPC) through legal notice No. 290 of 1988. Legal notice rendered Mombasa Pipeline Board Act 373 inoperable.	Objectives: To commercialise water sector operations, to achieve financial autonomy in water operations, to improve performances and efficiency of water schemes and to reduce dependence on public funding of independent water schemes.	
1989-1993		Sixth National Development Plan	Proposed consumers’ ability to pay to be considered when establishing charges and rules for their application.	Coverage targets: rural WS from 26 % to 50 % by 1993, urban WS from 75 % to 95 % by 1993.	
1991	Period of second multi-party democracy starts.			Urban Development Department (UDD) created within MoLG	
1990-1992			National Water Master Plan (JICA)	Focusing on technical issues. Yet: long-term plan for reforms (water pricing and legal framework).	
Early 1990s			Demand-driven approach (DDA) →	Establishment of Water and Sanitation Companies (under Companies Act, Chapter 486)	

APPENDIX 1

Policy trends and main events in the evolution of water and sanitation services in Kenya

Time / Period	Political events and trends	Economic policy events and trends	WSS policy events and trends	Water supply	Sanitation
1994			National Environmental Action Plan (NEAP)	Incentives for recycling water.	Introduction of proper facilities for pollution control. Use of cleaner process technologies.
1994-1996		Seventh National Development Plan		Ensure water resource conservation and management.	
1996		Policy Framework Paper on Economic Reforms for 1996-1998.	Preparation of National Water Policy begun.		
1999			National Policy on Water Resources Management and Development (Sessional paper No. 1.	Separation of water resources management from service provision. Rural water supplies managed by communities, urban water supplies managed by local authorities and NWCPC.	Environmental Management and Co-ordination Act (1999).
2000		Draft Poverty Reduction Strategy Paper		Aftercare study on NWMF: envisage 100 % access by 2010.	
2001			Country Strategy on Integrated Water Resources Management. Country Strategy on Water and Sanitation Services	Increasing role for the private sector in service delivery. Establishment of Water and Sanitation Companies (WSC).	Background documents for the Sanitation Policy: (1) Technology and information, education and communication and (2) Legal and institutional framework.
2002			Water Act 2002 enacted and published. It repeals Water Act 372 and some sections of local government Act Cap 265 that deal with water and sanitation services. Transition Plan for Implementation of Water Act. Water Sector Reform Secretariat (WSRS) and Steering Committee (WSRSC) established.	Establishment of Water Services Boards (WSB) (Nairobi). WSS Regulatory Board (WSRB) gazetted.	
2003	NARC regime starts.	Poverty Reduction Strategy finalised.	Ministry of Water Resources Management and Development (MWRMD) established. National Water Services Strategy (NWSS). National Water Resources Management Strategy (NWRMS).	Water Services Trust Fund (WSTF) gazetted.	Environmental Sanitation and Hygiene Policy drafted.

APPENDIX 2	EL NIÑO	MAENDELEO	KATIBA	FLYING GEESE
OVERALL SCENARIO DESCRIPTION (Kenya Scenarios, 2000)	<i>No political reforms and no economic reforms.</i> “El Niño is the road of neither economic nor political reform. El Niño is the road that leads to the total breakdown of Kenya.”	<i>Economic reforms with minimal political reforms.</i> “Maendeleo is the road of economic recovery without political reform. The overriding assumption in this story is that for as long as the economy is growing steadily, there will be little or no demand for political change.”	<i>Political reforms with minimal economic reforms.</i> “Katiba is the road of political reform with little parallel economic recovery as Kenyans search through their own traditions for comprehensive agreements that will allow them to face the future with confidence.”	<i>Simultaneous economic and political reforms.</i> “The Flying Geese story is about the success of determination, leadership, vision and the courage to venture into the unknown.”
OVERALL WATER SERVICES SECTOR DEVELOPMENT SCENARIO	Service coverage will not cope with the population growth. Water service coverage will be: in 2010 urban 80 %, rural 30 %, and in 2025 urban 75 %, rural 25 %. Sanitation service coverage will be: in 2010 urban 90 %, rural 75 %, and in 2025 urban 80 %, rural 65 %. Water sector reform implementation failed to a large extent, due to various impediments. As a result, the restructured water sector organisations continue performing poorly and business-as-usual prevails. New water legislation has not succeeded to improve sector performance, because compliance is poor due to inadequate enforcement and supervision. At individual and organisational level, old and inefficient working procedures and habits have continued. Bureaucracy has not been reduced. New WSPs have not been able to create customers' confidence and cost recovery remains low. Service quality to customers has remained low. The overall water and sanitation sector development has continued unsatisfactory: the WSS services situation has not been able to cope with the population growth.	Economic reforms enable slight improvement of service coverage, but far behind the overall targets. Water service coverage will be: in 2010 urban 85 %, rural 45 %, and in 2025 urban 85 %, rural 50 %. Sanitation service coverage will be: in 2010 urban 90 %, rural 75 %, and in 2025 urban 90 %, rural 75 %. Inadequate political support and commitment has constrained the water sector reform implementation. Establishment of new institutions and organizations has taken much longer than anticipated. Economic and financial resources for water and sanitation improvements have been rather good, but delayed implementation of the new sector administration and operational structure has largely undermined the efforts. The overall water and sanitation sector development and services situation has remained unsatisfactory as compared to the set goals and performance targets.	Restructuring enables more efficient service provision, but inadequate financial resources lead only to modest coverage improvements. Water service coverage will be: in 2010 urban 90 %, rural 60 %, and in 2025 urban 95 %, rural 70 %. Sanitation service coverage will be: in 2010 urban 95 %, rural 85 %, and in 2025 urban 95 %, rural 85 %. Water sector reform has succeeded well with the new institutional arrangements in principle, but their practical impacts on sector performance are limited due to inadequate financial resources for implementation. At the operational level (WSPs, districts, etc.) restructuring has improved staff motivation and skills, but also there inadequate financial resources seriously affect the activities. As a result, water and sanitation services have been improved only slightly and fall far behind the targets. Especially new investments in infrastructure have been too low.	Comprehensive reform both in institutional and economic arrangements facilitate coverage improvements which are in line with national and MDG goals. Water service coverage will be: in 2010 urban 95 %, rural 70 %, and in 2025 urban 100 %, rural 80 %. Sanitation service coverage will be: in 2010 urban 100 %, rural 90 %, and in 2025 urban 100 %, rural 95 %. Well coordinated and collaborate reforms between several sectors effectively remove the earlier fragmentation of water management. Joint efforts and coordinated use of resources enable real improvements both in water resources management and service provision. Diverse and balanced institutional and management arrangements of service provision – together with appropriate supervision and regulatory functions at all levels – have made it possible to improve WSS service coverage and quality in line with the optimistic national targets. Customers enjoy improved services and appreciate the new customer-oriented service concepts made available by a wide diversity of WSPs.

DRIVERS	EL NINO	MAENDELEO	KATIBA	FLYING GEESE
WATER RESOURCES	Scarcity of water resources falls critical in many areas. WPI falls to 40 by 2010 and to 35 by 2025. Water utilities in many areas have serious difficulties to supply adequate water to customers due to acute scarcity of water. Quality of both surface and ground water resources has deteriorated to alarming limits.	Scarcity of water resources remains persistently bad. WPI remains at about 45 by 2010 and gradually falls to 40 by 2025. Exploitation of water resources especially for agricultural and other productive uses continues high, and protection of water resources to ensure good water quality gets minor attention.	Scarcity of water resources continues the earlier trend. WPI remains at the current level of 47 by 2010, but then falls to 40-45 by 2025. Financial resources for water resource protection and conservation remain low, which leads to deterioration of water quality and serious problems for water utilities to supply adequate water.	As a result of sustainable conservation and environmental programmes, water scarcity has been kept in reasonable limits. WPI remains at 47 by 2010 but will be improved to 55 by 2025. Concerted efforts by WRM authorities, WSPs, customers and communities, availability of good quality water resources for domestic use has been possible to secure in all parts of Kenya.
FINANCIAL RESOURCES AND FINANCING	Financial and economic resources to implement water sector reform are not adequately ensured, because the financial allocation and budgeting procedures within the responsible authorities have not been reformed.	As a result of improved economic efficiency and transparency the water sector financing receives more attention in the budgeting process, but the increased sector funding will be largely inefficient due to incomplete institutional arrangement at the local level. Bureaucracy, incompetence, corruption and poor governance structures undermine the economic reforms carried out at the central level.	Due to minimal economic reforms the financial and budget situation of water sector organisations continues to be poor. Investments in water and sanitation infrastructure remain low, which leads to decreasing service coverage.	As a result of comprehensive economic reform at the central government and also at other levels, and increased commercialisation of the sector, adequate financial resources will be secured. These financial resources facilitate not only the implementation of the reform process itself, but also strengthening the capacity of all major actors at various levels.
HUMAN RESOURCES	Skilled human resources are highly inadequate at various levels. Training programmes associated with the reform process cover only part of the sector needs and concentrate largely on the central level personnel (policy and regulatory level staff at the headquarters level). Staff profile is rather narrow (administrative and technical) and does not cope well with the new and diverse WSS sector requirements.	Better economic status of WSS sector and better incentives has made it easier to attract skilled and educated personnel. However, inadequacies in the HRD and staff deployment planning have caused a lot of inefficiency: human resources are not properly utilised.	Restructuring has caused substantial staff relocations. Competent water sector staff of the districts have been partly transferred to local authorities and partly retrained as local level regulatory staff. Inadequate economic and financial resources still seriously constrain effectiveness of their work.	An extensive and well planned programme for human resource development as part of the water sector reform process has ensured adequate human resources and capacity at various levels. WSS sector HRD plans have been well coordinated with other sectors.
INSTITUTIONAL AND LEGAL ARRANGEMENTS	Institutional arrangements for water and sanitation service provision largely remain unchanged. Separation of service provision and regulatory responsibility take longer time than expected, and in practice the ministry remains regulator of its own services for several years, thus causing an unhealthy (competition) situation among the service providers.	Water sector reform process concerns in practice only drinking water services, but in the sanitation and sewerage sector institutional arrangements remain very fragmented.	The water sector reform process puts rather effectively in place the new institutional arrangements (regarding drinking water services and water resource management), but without adequate economic reforms its practical impacts at various levels remain very limited.	Simultaneous reforms within several sectors support each other and cause a boosting effect. Fragmentation of the institutional arrangements between the water and sanitation sub-sectors will finally be reduced, and for the first time the concept of integrated water resource management will be adequately internalised in Kenya.

Scenarios for the alternative futures of water services in Kenya and the water sector reform process

APPENDIX 2

DRIVERS	EL NINO	MAENDELEO	KATIBA	FLYING GEESE
WATER SECTOR ORGANISATIONS	New and restructured water sector organisations do not in practice change sector operations: business-as-usual continues due to inadequate change in the internal structures and informal institutions.	Restructuring of water sector organisations is well planned, but bureaucracy, incompetence, corruption and poor governance structures undermine the economic reforms carried out at the central level.	New and restructured water sector organisations do not receive adequate financial resources to work efficiently according to their prospected roles.	Delineation of sector organisations has succeeded well and roles are clear. Additional measures have been taken in sector co-ordination (national level) and regulation and supervision (regional level).
WATER POLICY DEVELOPMENT	The water policy (1999) has remained unchanged, which has led to inconsistencies and contradictions in several policy areas (asset ownership, regulation, etc.).	Tariff, cost recovery and financial management objectives of the water policy (1999) have been emphasised, and water legislation strengthened to adhere to the new requirements. Other policy objectives have largely been neglected due to lack of political commitment or inadequate institutional instruments.	Water policy (1999) objectives have in principle received sound attention at the political level, but economic and financial resources for water sector have not been secured due to persistent competition of scarce resources between various sectors.	The water policy (1999) has been amended in various points to improve earlier weaknesses: Asset ownership issues have been clarified and legislation amended accordingly. For instance in rural areas communities own the systems, but piped systems can be managed by (private) professional operators
POLICY TOWARDS LOCAL GOVERNMENT STRENGTHENING	Local government structures (towns and especially rural settlements) are much neglected in the national development policy. Municipalities and local authorities will have no role in water and sanitation service provision, all systems earlier managed by LAs have been handed over to other WSPs.	Local government gets improved taxation authority, which secures their economic base. However, their institutional and administrative restructuring has been inadequate, which makes them to continue performing poorly also in the future. A few water and sewerage systems operated by LAs function very poorly.	Local government gets increased political support, but economic resources are not secured. Some local authorities continue operating water and sewerage systems, but their economic and operational performance remains poor.	Local government is essentially strengthened both in urban and rural context. Both political and economic decisions on strengthening local government are made. Municipalities and local authorities continue as important and well performing WSPs in selected areas.
POLICY TOWARDS PRIVATE SECTOR PARTICIPATION AND ROLE	PSP is emphasised in official policies, but practical measures have not strengthened local PSP capacity, which is nearly non-existent. While LAs do not anymore operate WSS systems, the government (through MWRMD and NWCPC) have been forced to resume as main WSS service providers.	Economic policies emphasise strong role of private enterprises in all service sectors. Economic efficiency requirements challenge both public and private WSS sector WSPs, without adequate institutional arrangements their operational and management capacity cannot cope with the performance targets.	Official PSP and privatisation policies aim at a dominating role for the private sector in WSS service provision. However, economic and financial policy instruments have not been adequately implemented, which makes it difficult for both private and public WSPs to perform well.	PSP is recognised as an important and complementary way of resource mobilisation. Local private sector has systematically been strengthened to avail PSP capacity as prominent new WSPs. Diversity of management options is ensured: policies and strategies facilitate a balance of public and private stakeholders in WSS.

REFORM	EL NINO	MAENDELEO	KATIBA	FLYING GEESE
WATER SECTOR REFORM SCENARIOS	Water sector reform largely fails, because required reform in other sectors are not adequately implemented. Financial and economic resources to implement water sector reform are not adequately ensured, because the financial allocation and budgeting procedures within the responsible authorities have not been reformed. Human resources needed at various levels are not adequately assured. Training programmes cover only part of the sector needs and concentrate largely on the central level personnel (policy and regulatory level staff at the headquarters level). Institutional arrangements for water and sanitation service provision largely remain unchanged. Separation of service provision and regulatory responsibility take longer time than expected, and in practice the ministry remains regulator of its own services for several years, thus causing an unhealthy (competition) situation among the service providers.	Economic regulatory system will be put in place for water service providers, but institutional arrangements regarding clear separation of roles remain poorly implemented for a number of years. Water sector reform process concerns in practice only drinking water services, but the reform in sanitation and sewerage services remains only partly implemented. In sanitation services the institutional arrangements remain very fragmented. Authorities and implementing actors are mainly interested in drinking water services (due to expectations in economic gains), and as a result the sanitation and environmental situation in Kenya becomes worse. As a result of improved economic efficiency and transparency the water sector financing receives more attention in the budgeting process, but the increased sector funding will be largely inefficient due to incomplete institutional arrangement at the local level. Bureaucracy, incompetence, corruption and poor governance structures undermine the economic reforms carried out at the central level.	The water sector reform process puts rather effectively in place the new institutional arrangements (regarding drinking water services and water resource management), but without adequate economic reforms its practical impacts at various levels remain very limited. The bureaucracy and inefficiency at the local level (districts, municipalities) is largely removed theoretically as a result of major local government reforms. The overlapping arrangements between district administration and local authorities have been restructured by gradual downsizing and eventual abolishment of the entire district administration (for technical services). The competent water sector staff of the districts have been partly transferred to local authorities and partly retrained as local level regulatory staff. However, the possibilities of the staff to work efficiently and the new structures to improve sector situation at the local level remain very poor, because minimal economic reforms cause the financial and budgeting situation to continue drastically low.	During the initial stages of the water sector reform process it was realised that the success requires collaborative efforts between various sectors. Simultaneous reforms within several sectors support each other and cause a boosting effect. Sanitation and sewerage sector will be more strongly associated to the water sector reform process. Fragmentation of the institutional arrangements between the sub-sectors will finally be reduced, and for the first time the concept of integrated water resource management will be adequately internalised in Kenya. The amended and improved water sector reform process will be complemented with a massive programme for human resources development in all important areas of the sector reform and at all levels. As a result of comprehensive economic reform at the central government and also at other levels, and increased commercialisation of the sector, adequate financial resources will be secured. These financial resources facilitate not only the implementation of the reform process itself, but also strengthening the capacity of all major actors at various levels. Financial allocations and budgeting procedures have been substantially strengthened. Resource allocation is more rational after the overlapping functions of the District Water Offices and local authorities (autonomous water and sanitation companies) were merged.

SWOT analysis of the water services in Kenya and the reform process.

STRENGTHS (S)	WEAKNESSES (W)
POLITICAL • Need for reform is strongly felt due to long lasted poor sector performance and inadequacy of resources. • Reform process creates trust and receives support from several external support agencies. ECONOMIC • Reform process attracts external funding from ESAs. • New arrangements facilitate realistic tariffs, appropriate internal cross subsidies and efficiency in provision of water services. • Reform is asset-based. SOCIAL • Reform focuses on specific geographic and social areas. • Reform emphasises poverty alleviation targets. TECHNOLOGICAL • Success in some pilot utilities – such as Nyeri and Eldoret – encourages others to make restructuring and improvement. • Reform facilitates improved service delivery and coverage also in sanitation. • Existing technical staff is well trained, but the reform aims at improving both technical and managerial capacity. ENVIRONMENTAL • New WRM strategy emphasises conservation and equitable distribution and sustainable use of water resources. LEGAL / INSTITUTIONAL • New legal framework – especially Water Act 2002 – enables reforms and clarifies roles and separation of policy making, water resource management, and service provision.	POLITICAL • Reform process has started top-down from the national level, and it is also fairly donor and consultant driven. • Proposed and already legally enforced institutional arrangements do not fully remove the multiple roles of MWRMD. • Government intervention continues strong in areas without established WSPs. ECONOMIC • Sustainable and innovative financial mechanisms have not been adequately addressed in the new policies and strategies. SOCIAL • Reform and new arrangements are insensitive to individual consumers. Customer-orientation will not increase. • Assumed time schedule for implementing the reform process is unrealistic in relation to the local capacity and resources. • Low motivation among civil servants will continue. TECHNOLOGICAL • Sanitation has not been adequately addressed in the reform process, and not adequately integrated to water supply. • Operations and maintenance of existing systems is poor, which leads to inadequate service capacity and quality. ENVIRONMENTAL • Water scarcity is already presently severe in many areas. • Quality of water resources is deteriorating. LEGAL / INSTITUTIONAL • Present institutional arrangements are working poorly (deconcentrated, centralised, bureaucratic). • Ownership of assets is still unclear, especially in areas where WSB boundaries are not yet known. • The future roles and responsibilities of local authorities in WSS have not been adequately expressed in the reform plan.

SWOT analysis of the water services in Kenya and the reform process.

OPPORTUNITIES (O)	THREATS / LIMITATIONS (T/L)
POLITICAL • New political culture (NARC) can provide for better political commitment and goodwill to reforms. ECONOMIC • Systematic and economically efficient development strategy • Increased efficiency in operations and service delivery. • Good economic and business opportunities for WSPs. SOCIAL • Increased involvement of various stakeholders. • Improved ethnic harmony as a result of reduced water conflicts. • Sensitisation on water demand management (ownership) • Provides opportunities for human resource development, especially for training specialised people. • Reform encourages education and development of women. TECHNOLOGICAL • New arrangements encourage applied research and innovative technologies. ENVIRONMENTAL • Long-term sustainability and conservation of water resources through holistic catchment area thinking and demand management strategies. LEGAL / INSTITUTIONAL • New water policy provides enabling environment for reform continuation. • Water Act 2002 provides a solid basis for appropriate institutional arrangements. • Independent regulatory framework proposed, but regulation details and local capacity need more elaboration.	POLITICAL • Political interference in getting up WSB boundaries. Politicians may have vested interests. • Multinational companies may dominate water markets especially in major cities. • Lack of visionary management ECONOMIC • Cost of the reform process: Allocation of financial resources (and budgeting procedures) may not in practice facilitate implementation of reform. • Assets may be undervalued, causing poor cost recovery. SOCIAL • Local commitment to reforms may be low or at least at risk. Resistance to change may arise from several reasons, e.g. fear of losing jobs. • Dissemination of the policy and other reform components may not succeed as well as hoped in the field. • Lack or overlapping of communication. TECHNOLOGICAL • Water resource allocation may continue posing problems: Water resources scarcity and variation in availability. • Inadequate human resource capacity, especially at the lower levels (provincial, district, divisional) may limit implementation and effective operations. ENVIRONMENTAL • Kenya will have an increasingly critical scarcity of water resources. Resource allocation may pose conflicts in future. • Improved service provision leads to increased water use and thus increases pollution. LEGAL / INSTITUTIONAL • New policies and strategies may be recognised in principle, but old procedures (business-as-usual) may persistently continue. Informal institutions are difficult to change.

STRATEGIC DEVELOPMENT PROGRAMME FOR KENYA'S WATER SECTOR REFORM IMPLEMENTATION APPENDIX 4

DEVELOPMENT NEEDS AND TARGETS	TARGET LEVEL (2025)	KEY STRATEGIES (2025)	NUCLEI OF ACTION (2010) (development programme)
WATER AND SANITATION POLICY DEVELOPMENT	Holistic, integrated and realistic national water and sanitation policy is in place and implemented.	Access to safe water and improved sanitation services provided to all Kenyans.	1999 National Water Policy updated and a realistic sanitation policy put in place.
(INTEGRATED) WATER RESOURCES MANAGEMENT STRATEGY	Adequate quantity of good quality water is available for various uses in all situations.	Protection and conservation of water resources through IWRM concept.	Finalisation of all specific catchment area / IWRM strategies and updating and monitoring of National Water Resources Management Strategy (NWRMS). Water Resource Management Authority (WRMA) established and operationalised by 2004. Catchment Area Advisory Committees (CAACs) established by 2004.
WATER ABSTRACTION AND SUPPLY FOR DOMESTIC USE	Ground and surface water resources to satisfy both present and future requirements for domestic water use are ensured.	Appropriate water resources and source protection and abstraction plans and programmes.	Protection plans for ground water intakes and important aquifer areas. Also protection plans for water towers put in place and being enforced.
WASTEWATER TREATMENT AND WATER PROTECTION	All urban centres have adequate and appropriate level of wastewater treatment. Discharge of untreated wastewater from urban and rural centres is minimised.	National strategy and development programme for water protection and wastewater treatment.	Revised and improved standards for wastewater treatment and disposal (effluent standards). Establishment and strengthening of water quality monitoring and regulatory programmes.
WATER SERVICES PRODUCTION	Good quality and sustainable water services are available for all Kenyans. Diversity of management options for service provision is available.	National water and sanitation policy, water legislation and institutional arrangements facilitate various types of management options.	Restructuring of water services sector: Contracting of Water Service Providers (WSPs) and operationalisation of all Water Services Boards (WSBs) by 2006. Restructuring of sewerage services sector: Establishment of Water Service Providers (WSPs) and Water Services Boards (WSBs) by 2006.
SEWERAGE AND SANITATION SERVICES PRODUCTION	Improved sewerage and sanitation services are available for all Kenyans. Diversity of management options for service provision is available.	National water and sanitation policy, water legislation and institutional arrangements facilitate various types of management options.	Restructuring of sewerage services sector: Establishment of Water Service Providers (WSPs) and Water Services Boards (WSBs) by 2006. National Sanitation Policy finalised by 2005.

APPENDIX 4

STRATEGIC DEVELOPMENT PROGRAMME FOR KENYA'S WATER SECTOR REFORM IMPLEMENTATION

DEVELOPMENT NEEDS AND TARGETS	TARGET LEVEL (2025)	KEY STRATEGIES (2025)	NUCLEI OF ACTION (2010) (development programme)
MANAGEMENT OPTIONS FOR WATER SERVICES	Diversity of management options for service provision is available.	Private sector participation encouraged. Local authorities strengthened. Community- and user-managed systems supported. Regional co-operation between utilities encouraged.	Capacity building for local authorities who already are Water Service Providers (WSPs) starts in 2004. More local authorities that wish to become WSPs encouraged and supported.
FINANCIAL AND ECONOMIC RESOURCES FOR WATER AND SANITATION DEVELOPMENT	Adequate resources are available for sustainable development and operation of water and sewerage facilities and services.	Sustainable cost recovery and tariff policies and strategies. Financial management procedures of WSPs based on commercial and self-supporting principles.	Proper investment programme finalised. Tariff development policy put in place. Water Services Trust Fund (WSTF) operationalised by 2004.
REGULATORY FRAMEWORK	Independent regulatory system is in place for • economic • environmental • water quality • technical operations • business operations • assets management	Clear standards are put in place. Linkage with other institutions with mandates clearly defined.	WSRB established by 2005 (economic & technical regulation). Ministry of Health resources strengthened for WQ regulation. Ministry of Environment and its regional offices for environmental regulation. Establishment of Regional Environment Centres (RECs). Role of National Environmental Management Authority (NEMA) clarified as an environmental licensing authority.
PERFORMANCE ASSESSMENT AND IMPROVEMENT FOR WATER AND SEWERAGE UTILITIES	Water and sewerage utilities (WSPs) operate well and perform their functions efficiently and effectively.	Performance assessment and improvement strategies and programmes for WSPs.	Development of appropriate Performance Indicators (PIs) for WSPs.
IMPROVED OPERATIONS AND MAINTENANCE AND ECONOMIC PERFORMANCE OF WATER AND SEWERAGE SYSTEMS	All water and sewerage systems are operated with minimum breakdowns according to FCR principles.	Financial management procedures of WSPs based on commercial and self-supporting principles. Full Cost Recovery (FCR) principle applied to all WSPs. Preventive O&M strategies applied.	Alternative options of management in rural areas introduced to take into account cost recovery mechanisms.

APPENDIX 4

STRATEGIC DEVELOPMENT PROGRAMME FOR KENYA'S WATER SECTOR REFORM IMPLEMENTATION

DEVELOPMENT NEEDS AND TARGETS	TARGET LEVEL (2025)	KEY STRATEGIES (2025)	NUCLEI OF ACTION (2010) (development programme)
HUMAN RESOURCE DEVELOPMENT AND TRAINING	Adequate human resources available for all sector organisations at all levels.	National strategy for WSS sector HRD and capacity building.	Comprehensive WSS sector training and HRD programmes at various levels planned by 2006, and linked to National Human Resources Development by Directorate of Personnel Management (DPM).
INSTITUTIONAL ARRANGEMENTS AND WSS SECTOR ORGANISATION	Roles and responsibilities of WSS sector actors are clear. Good enforcement and compliance of laws and regulations. Good governance principles followed.	Continuous follow-up and necessary adjustment of policy and institutional framework.	Improved enforcement and supervision mechanisms established for Water Act 2002. Good governance principles operationalised in WSS organisations through a training and advocacy campaign.
ROLE OF MINISTRY OF WATER RESOURCES DEVELOPMENT AND MANAGEMENT	The Ministry has the role of policy maker and overall coordinator of water resources management.	The Ministry is carrying out its functions to the satisfaction of all stakeholders in the sector.	Reorganisation of MWRMD completed by 2005. Clarification of roles between MWRMD and other ministries to remove multiple roles by 2007. MWRMD to be adjusted to MWR.
ROLE OF OTHER MINISTRIES INVOLVED IN WATER RESOURCES UTILISATION AND MANAGEMENT	Overall co-ordination between various ministries is effective. Roles and functions of all ministries and authorities have been clearly defined.	Improved separation and delineation of responsibilities and powers of ministries according to the principles of good governance.	WSS Co-ordination Committee established at the national level by 2006.
ROLE OF LOCAL AUTHORITIES AND MUNICIPALITIES	Local authorities have an essential role in owning and managing urban water and sewerage systems.	Strengthening the role and capacities of local authorities (by reactivating e.g. the Kenya Local Government Reform Program, KLGRP).	Urban water systems handed over to autonomous water companies created by Local Authorities by 2006.

ARTICLE I

Seppälä, O.T. 2002. Effective water and sanitation policy reform implementation: need for systemic approach and stakeholder participation.

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Effective water and sanitation policy reform implementation: need for systemic approach and stakeholder participation

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Abstract

This paper analyzes development trends in water and sanitation policies and strategies of donor organizations and developing countries. The review covers Finnish development assistance and recent water and sanitation sector policies of Kenya, Zanzibar, Sri Lanka and South Africa.

Donor agencies have earlier concentrated on fashionable issues that have once been considered crucial, but a holistic and systemic approach has been lacking. Integration of water and sanitation policies with other sector policies is important. Implementation of reform processes in the field has often failed, because involvement and commitment of stakeholders at all levels has been inadequate. It is essential to build the capacity of sector professionals, civil society and communities to understand, commit to and promote the new policies.

Successful policy and reform implementation requires political will and facilitation, but technical, economic, environmental and social considerations are also important. The impediments to implementation are complex, and effective solutions are demanding and highly interrelated. Futuristic systems thinking and visionary approach are useful tools in dealing with the complex institutional environment and assessment of future reform impacts.

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Keywords: Water policy; Reforms; Institutional framework; Institutional change

1. Introduction

International assistance in water supply and sanitation (WSS) for developing countries started on a large scale in the 1970s. The support grew substantially during the International Drinking

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Water Supply and Sanitation Decade (1981–1990). The investments were financed mainly by donor agencies, but the actual improvement in service coverage and operations of water and sanitation facilities in developing countries remained modest. Since then, actual investment in the water and sanitation sector has increased little. Actually, the trend has been to reduce investments in rural and peri-urban areas. Besides, the provision of sanitation facilities has not been given the priority by decision makers. The recent approach of the external support agencies (ESAs) has been to concentrate more on capacity building and policy support. Yet, in the beginning of the new millennium, the situation in developing countries remains far from satisfactory.

The common water sector problems in developing countries are (modified from Saleth & Dinar, 1999, 2000)

- increasing relative water scarcity and stress;
- deterioration of water quality;
- inter-sectoral and inter-regional water allocation conflicts;
- inappropriate pricing of water, inadequate cost recovery, and non-viable operational and financial performance;
- excessive government involvement and bureaucratic control;
- outdated institutional arrangements; and
- fragmented and poorly coordinated water administration.

There are causal relationships between water scarcity, water quality, and allocation conflicts. Similar linkages also exist between cost recovery and operational performance of water systems. These linkages are rooted in institutional arrangements, since they are related to ownership, policy issues such as water pricing, and administrative issues such as investments and cost recovery arrangements (Saleth & Dinar, 1999).

The WSS policies of many developing countries seem good on paper, but are not effectively implemented. The policy statements may be well defined, but the action plans aiming at implementing the policy are often unrealistic and impractical. This paper reviews and discusses the impediments to policy implementation and proposes some improvements to future policy development and the institutional framework in the light of some lessons learned from past policies and strategies of donor organizations and developing countries. The paper is partly based on the author's own field experiences from water policy development and implementation mainly in two developing countries: Kenya and Zanzibar (Tanzania).

2. Past experiences and inadequacies of international water and sanitation policies and strategies

2.1. Trends in policy development

The arrangements for dealing with water resources have evolved mainly in industrialized countries, particularly, as concerns the roles played by bilateral and multilateral ESAs providing official development assistance. Early water development assistance tended to be project-specific and fragmented with little exchange of information and experiences between countries and among agencies (Grover, 1998). Towards the end of the 20th century, international agencies and

countries have begun to have much more interaction and cooperation with regard to development of water policies and strategies. Global and supranational strategies and visions have been developed.

Table 1 describes the evolution and development features of water and sanitation policies and strategies of main donor agencies, which are also extensively reflected in the policies of recipient countries:

Mikkola (1997) has compiled an interesting review of donor strategies and policies (including WSS sector policies of 13 bilateral and six multilateral development agencies). The policies had a lot of similarities and international consensus is strong in certain areas. WSS sector policies are not directly derived from the general strategies of donors. There are links between the two and the evolution of thinking at the general strategy level is reflected in WSS sector policies, e.g. environmental and gender issues. Human rights, democracy, good governance and environmental issues have become key considerations for most donor agencies. Some policies state that water is elementary for all goals of development assistance except human rights and democracy issues (Mikkola, 1997). In practice, however, WSS sector interventions could actually be seen as an exemplary means of developing human rights, democracy and good governance at the local level and as an entry point for development in other sectors as well. This potential has not been adequately recognized by donor agencies.

Some of the major paradigmatic changes in WSS policy thinking both among international agencies and developing countries within the last few decades include the following (Table 2).

2.2. Why have past policies not been successful?

The concept of appropriate policy is not universal and cannot be generalized. The water policy must be appropriate to the particular social, environmental and economic context in which it is implemented. Implementation of WSS policies has not been very successful. It is fairly easy to formulate policies, and relatively easy to pass legislation, but much more difficult to change informal institutions such as attitudes, human and organizational behavior, codes of conduct and behavioral patterns.

Many governments assume that their WSS policies are appropriate and justified. Therefore, it is difficult to get them interested in reforming their policies. Another issue is that even appropriate and systemic water policies may not become effectively operational at the field level. There are several impediments to policy reform implementation at various levels. These factors seem to be similar everywhere and are largely independent of nationality and culture. The most important of these factors can be grouped as in Table 3. As can be seen, these factors are broadly applicable to water policy implementation (Glenn & Gordon, 2000).

Abrams (2000b) listed some barriers to implementation of water policy reforms that are largely in line with those mentioned in Table 3. They include

- technically inadequate policy;
- socially and culturally unacceptable policy;
- economically infeasible policy;
- reliance on too optimistic availability of human resources;
- contradiction with constitutional requirements;

Table 1
Evolution of water sector development policies and strategies

Period	Overall description of policy and strategy thinking among donor agencies (and developing countries)	Landmark events with impact on international water policies	Emphasis on selected issues and aspects	Slogans characterizing the period
1950–1960	Recognizing the importance of water and sanitation for better health and development. Most developing countries were still under colonial water management.	First bilateral donor agencies established.	Health aspects.	
1961–1970	Series of water crises and linkage of the crises with population growth. Free or heavily subsidized water in many developing countries. Post-colonial efforts for independence and self-reliance by developing countries.	Regional development banks (ADB, AfDB, IADB) established.	Technical aspects. Water production.	Technology transfer. Intermediate technology.
1971–1980	UN initiative and preparation of the water decade with a series of international conferences. This period still followed the classical public health paradigm of engineering solution in tackling the challenge. Water as a social good.	UN Conference on the Human Environment. (Stockholm, 1972). UNEP established (1972). UN Water Conference (Mar del Plata, 1977). UNDP-WB Water and Sanitation Program established (1978). UNCHS (Habitat) established (1978). Hydrology decade.	Technical aspects. Project implementation. Social aspects. Rural water supply. Urban sanitation.	Appropriate technology. Crash programs.
1981–1990	Major international effort through the Water Decade activities. Supply-driven approach (SDA). Introduction of low-cost affordable technologies, capacity building, and the realization that community participation is the key for sustainable projects. Decentralization. Water was considered as an economic good. Yet, emphasis was on the public health aspects of water supply and sanitation.	International drinking water supply and sanitation decade (IDWSSD, 1981–1990). Global consultation on safe water and sanitation for the 1990s (New Delhi, 1990). UN General Assembly (1990). Water Supply and Sanitation Collaborative Council (WSSCC, 1990).	Technical aspects. Project implementation. Operation and maintenance. Social aspects. Economic value of water. Capacity building. Rural water supply and sanitation. Handpump technology.	“Water and sanitation for all by 2000”. Sustainable development. Community participation. Cost recovery. Cost sharing. Willingness and ability to pay. Human resource development. Capacity building. Women in development.
1991–2000	Post Water Decade period with some frustration on modest decade achievements.	UNDP Capacity Building Symposium (Delft, 1991). Nordic Freshwater Initiative	Environmental aspects. NGO and CBO	Community management. Stakeholder

Table 1 (continued)

Period	Overall description of policy and strategy thinking among donor agencies (and developing countries)	Landmark events with impact on international water policies	Emphasis on selected issues and aspects	Slogans characterizing the period
	CSD6 considered water one of two important issues. In the UN Special Session for Rio + 5 in 1997, water supply and sanitation was identified as the priority area for UN and all organizations concerned. Yet, there has been a reduction in actual global investment in WSS. Water and sanitation as a basic human need. Management and use of water as a part of environmental protection and sustainable development. Concern about water scarcity and pollution. Management of water at the lowest possible level. Customer orientation. Demand-driven approach (DDA). Demand-responsive approach (DDA). Development of the World Water Vision until 2025.	(1991). International Conference on Water and the Environment (Dublin, 1992). UNCED Earth Summit (Rio, 1992). Rio Declaration. Agenda 21. CSD. Drinking Water and Environmental Sanitation Conference & Ministerial meeting (Noordwijk, 1994). UN Conference on Population and Development (Cairo, 1994). World Summit for Social Development (Copenhagen, 1995). Habitat II (Istanbul, 1996). World Food Summit (Rome, 1996). World Water Council (WWC, 1996) and Global Water Partnership (GWP, 1996). First World Water Forum (Marrakesh, 1997). Second World Water Forum (The Hague, 2000). World Water Vision (2000). Vision 21 (2000). Iguacu Action Programme (2000). UN Millennium Assembly (New York, 2000). UN Millennium Declaration 2000.	role becoming stronger. Role of women. Gender issues. Water as an economic good. Institutional strengthening. Poverty alleviation. Urban and peri-urban water supply and sanitation.	participation. Demand management. Demand-driven Approach (DDA). Demand-responsive approach (DRA).
2001-	Implementation and empowering the Vision. Increased responsibility to user communities, governments as facilitators. Networking and partnership approaches. Advocacy. Attention to water scarcity in certain regions. Transboundary and crossboundary water resources. Water conflicts. River basin management. Water and sanitation as a basic human right.	International Conference on Freshwater (Bonn, 2001). World Summit on Sustainable Development (WSSD, Rio + 10, Johannesburg, 2002). Third World Water Forum (Kyoto, 2003). International Freshwater Year 2003.	Private sector. Hygiene and sanitation. Tradable water rights. Water allocation. Hydrosolidarity. Water security. Water ethics. IWRM. Good governance.	Privatization. Public-private partnerships. 'People first'. Community ownership. 'Everybody lives downstream'.

Sources: Ghosh (1999), Grover (1998), Black (1998), Katko (2001), Björklund (2002).

Table 2

Major paradigmatic changes in water and sanitation policy thinking

Old thinking	→	New thinking
Water development	→	Water allocation
Emphasis on water quantity	→	Emphasis on water quality or quality-quantity
Water and sanitation as basic human needs	→	Water and sanitation as basic human rights
Water as a social good	→	Water as an economic good
Centralized management and administration	→	Decentralized management and administration
Government (state) provision	→	Government facilitation
Administrative domain	→	Service domain
Supply driven approach	→	Demand-driven approach → Demand-responsive approach
Water supply	→	Water services
Production (agency) orientation	→	Customer orientation
Hardware projects	→	Software projects

- policy implementation blocked by other government departments because of lack of coordination and consultation; and
- external factors such as poor public servant morale and public resistance.

2.2.1. *The Finnish experience*

Finnish support to WSS sector in 1968–2000 was recently evaluated (Skyttä, Ojanperä, & Mutero, 2001). Although the evaluation recognized the high overall quality and success of Finnish water sector development co-operation—especially concerning implementation of projects—the overall development policy and administrative regime needs to improve a lot. The evolution of Finnish development assistance probably reflects fairly well the paradigmatic changes in water sector development co-operation in general. Past assistance and interventions have generally been criticized for the following:

- Policies, strategies and interventions have not been very holistic, but rather fashionable.
- They have, to a large extent, been dominated by launching of new development slogans rather than innovative action.
- Policies and strategies seem not to have provided continuity, but rather discontinuity depending on changes in politics or administrative staffing.
- Interventions have not been planned on the basis of long-term sustainability, rather based on intention to withdraw from assistance as soon as possible.
- Planning has been based on short-term thinking restricted, for instance, by lengths of parliamentary terms.
- Visionary thinking has been scarce both in project planning and implementation.
- Recipients have not adequately committed themselves to the donor interventions, which has resulted in poor sustainability.

Finnish experiences and the summary in Table 1 shows how ESAs in various decades have concentrated on selected policy level issues that have been considered crucial at the time while

Table 3

Impediments to action and decision-making with implications for water policy reform and implementation

Constraint/impediment	Description
1. Political constraints	Policy or action interferes with national (or personal) interests. Action proposed by a political opponent. Inadequate involvement of stakeholders and interest groups. Lack of political commitment and motivation. Political risks inadequately evaluated
2. Institutional constraints	Reluctance to act. Lack of adequate coordination. Lack of institutional inertia. Lack of institutional incentives. Fragmentation of institutions
3. Strategic constraints	Lack of clear-cut strategies and goals. Lack of coordinated strategies and action among actors and stakeholders
4. Disinterest in the future (Myopic approach)	Near-term issues stressed more than long-term issues with future consequences. Lack of visionary thinking and leadership
5. Complexity of issues	Poor understanding of the magnitude of problems. Lack of models to conceptualize complex interdependence of events and policies. Poor understanding consequences of actions. Stereotypical thinking
6. Planning inadequacies	Non-integrated planning. Lack of long-term views in planning. Unrealistic action plans
7. Financial constraints	Lack of funding and appropriate financing mechanisms. Unwillingness to pay. Transaction costs of reform
8. Human resources constraints	Lack of professional sector personnel, yet organizations often overstaffed. Lack of decision-making skills. Inability to understand complex and holistic nature of decisions and policies. Lack of staff motivation and incentives. Lack of morale
9. Information and communication constraints	Lack of accurate, reliable and sufficient data and information. Uncertainty of the risks. Conflicting information. Lack of coordinated scanning. Inadequate communication and dissemination of policy decisions
10. Consensus and coordination constraints	Differing interests and ideology among stakeholders. Inadequate interaction and coordination among stakeholders

Source: Adapted from Glenn and Gordon (2000, p. 82).

ignoring the systemic approach to a large extent. In the future, the ‘*institutional landscape*’ should cover all those issues in a balanced manner, to enable development of viable water and sanitation services.

2.2.2. Donor dominance

WSS policies of most developing countries have been developed with donor assistance. Therefore, the policy documents often reflect the strategies of the donor countries and organizations rather than the indigenous strategies of the recipients. Since the donor policies and strategies have been fairly shortsighted and fashionable, recipient country policies have also become susceptible to similar limitations. Donor dependence in policy formulation resembles, in a way, the ‘*principal-agent syndrome*’. While donors are anxious to assist programs that will become self-sustaining, their assistance can create dependence with respect to both funding and technical assistance. In the past, the overriding efficiency criteria resulted in the introduction of technologies and policies that are inappropriate to the existing institutional structure (Carruthers & Morrison, 1996).

One of the drawbacks of past policies is the lack of sufficient monitoring and enforcement mechanisms. Political, institutional and social questions are often more difficult and challenging than technical ones (Dinar, 1998). One key constraint is that institutions and principles of water rights have in many cases been set up in past times and are not compatible with present demographics (Catley-Carlson et al., 1999). Information requirements for institutional and policy reform are often downplayed. Policy-makers are unaware of the value of information or do not know what their information needs are (Dinar, 1998). The economic value of water has not been adequately recognized and inadequate emphasis has been given to incentives that signal the value of water and induce conservation and better management (Dinar, 1998).

2.3. Case studies: institutional lessons from selected regions/countries

2.3.1. East African region

Until recent years, few countries in Africa have had formal WSS policies. Many have had strategic plans, targets and projects, but these have existed largely in a policy vacuum. In fact, there is political reluctance to develop policy because an official policy would constitute a public standard against which performance can be measured (Abrams, 1996). Most of the countries have fragmented institutions dealing with water, sanitation and related issues, but the mandates of diverse institutions tend to be fragmented, uncoordinated and unclear. Yet, many African countries, specifically those in the Eastern and Southern parts of the continent, have renewed or launched national water policies during the last decade. These include, for instance, Kenya, Tanzania, Ethiopia, Zambia, Mozambique, Namibia and South Africa.

Some institutional and policy shifts in East Africa at both national and international levels have been established by the first and second Drawers of Water studies carried out 30 years apart (Thompson & Bradley, 2000). These changes have had a profound effect on people's access to efficient, effective and equitable water and health services. The factors include increasing private provision of water and sanitation services and financing, and the growing importance of non-governmental organizations (NGOs) and community-based organizations (CBOs). Donors have played a significant political and financial role in the water and sanitation sectors in East Africa. The voluntary sector consisting both of NGOs and CBOs is also driven by donor funds and priorities to a large extent. The linkage of the voluntary sector to the state and donor agencies still remains crucial (Thompson & Bradley, 2000).

A new vision of improved access to and use of water and environmental health services in East Africa will require a combination of innovative policies and flexible funding arrangements to address the water, health and hygiene needs of poor people in both rural and urban communities. It will also require strengthened public and private organizations to develop, operate and maintain water systems and services sustainably, and new partnerships between the state, local administration, private sector and civil society that promote market-based water development while creating co-operative management arrangements that work for the benefit of both people and the environment (Thompson & Bradley, 2000).

2.3.2. Kenya

Past measures and policies in Kenya have not effectively addressed the problems facing the WSS sector in urban areas. The main reasons for the inefficiency and ineffectiveness have been

(Fama Resources, 2000)

- Politics of water and the attendant tendency to consider water a social good despite new policy changes.
- Uncertainty over the policy regime and regulatory framework.
- Unclear role of the private sector in the WSS sector.
- Lack of performance standards for water utilities.
- Highly centralized system of managing public water utilities [e.g., National Water Conservation and Pipeline Corporation (NWPC) and Ministry of Environment and Natural Resources (MENR)].
- Lack of managerial and operational autonomy of service providers.
- Inadequate customer/user involvement.

Corporatization of urban WSS in Kenya (mainly through NWPC) undertaken since the late 1980s has not been very successful as the intended efficiency gains have not yet been realized. However, it is believed that further commercialization through establishment of autonomous water and sanitation companies is necessary (Fama Resources, 2000). Four companies have been established (Nyeri, Eldoret, Kitale and Nakuru), but already two (Kitale and Nakuru) were found unsuccessful and returned under the management of the Department of Water Development.

The new national water policy for Kenya was officially launched in 1999 (Republic of Kenya, 1999). Preparation and enforcement of the new policy in Kenya involve a long and time-consuming process. Preparation started in the early 1990s. The new policy is still rather vague on institutional arrangements, although it tackled issues pertaining to the development, institutional framework and financing of the WSS sector. Sustainable provision of WSS services requires application of alternative management options that are participatory. This means greater emphasis on participation especially of the private sector in the provision of services (Republic of Kenya, 2001).

The statements of the new policy are largely consistent with the common trends observed in most developing countries such as an emphasis on increased stakeholder participation and integrated water resource management. As a whole, the policy is still fairly limited in scope as compared to some more comprehensive sector policies launched recently by other countries (e.g., South Africa and Sri Lanka). The linkage to overall economic and social development in the country is very weak. The key message of the policy is related to the limited capacity of the government for water service provision and the consequent change of roles. The policy and the associated action plan cannot properly set up the framework and procedures for a sustainable restructuring of the government's role. The inadequacies and inconsistencies regarding the water services sector include the following:

- (i) Handing-over of government owned and managed water supplies to communities and local authorities: the policy supports the process, but in reality there are severe difficulties (including ownership of physical assets, huge need of investments into infrastructure rehabilitation, etc.).
- (ii) The regulatory structure is inadequately described: change in the government's (water ministry's) role from service provider to regulator does not seem well planned and transparent.

- (iii) Human resource issues have not been considered adequately: There is currently a shortage of professional personnel (although overstaffing in general), and institutional reform does not actually reduce the need for human resources significantly if at all.
- (iv) The role and capacity of private sector participation has not been adequately covered: the government seems to think that handing-over can happen in an institutional/policy vacuum?
- (v) The action plan is not realistic in terms of its time frame: e.g. handing-over, regulatory structures etc. definitely take much longer than envisaged.

The new policy has been considered inappropriate from the water resource management point of view. The policy was formulated based on limited consultations and heavily embraces the traditional command and control approach to water management, and only marginally integrates economic and participatory tools in the management of water resources (Hirji, 2000). Further changes in the policy and water legislation were found necessary to strengthen water resources management, such as re-introducing water user charges, establishing autonomous catchment boards, strengthening demand management and encouraging economic and participatory instruments (Hirji, 2000). Some of the limitations of the policy have been rectified in the process of finalizing the revised Country Strategy papers on (1) Water and Sanitation Services (Republic of Kenya, 2001) and (2) Integrated Water Resources Management (Republic of Kenya, 2002). After launching the new water policy, Kenya is now struggling with dissemination and implementation of the policy in the field. Slow operationalization of the policy has already affected the credibility of the envisaged time schedule of the action plan. Enforcement of the policy through enactment of associated water legislation is ongoing, but seems to take a long time. The old Water Act (Chapter 372) from 1972 has been revised. The new Water Bill 2001 is yet to be approved by the Parliament (situation in May 2002). Restructuring the water administration and establishing independent regulatory bodies is still at its initial stages. Ownership of water supply facilities still remains debatable. If the physical assets of water supply utilities will be transferred to the new Water Supply and Sanitation Services Board (WSSB), it is likely that customers, stakeholders and operators of water utilities will not have adequate motivation and ownership attitude to manage and maintain facilities properly.

2.3.3. Zanzibar

Zanzibar is a semi-autonomous part of the Republic of Tanzania. Regarding water management, Zanzibar has its own institutional, legal and administrative structures independent of mainland Tanzania. During colonial times, until the 1960s, water services in Zanzibar (especially in Unguja island) were operational and the institutional framework supported viable water supply management. There was no official water policy, but there were rules and regulations (“‘Towns’ Water-Works Rules, 1940”) that were implemented and even relatively well enforced. In theory, the old rules (latest amendments in 1970) are still legally valid, but in practice, they are not enforced or followed.

In 1981, the Zanzibar government decided to provide water supply to domestic household customers free of charge. This reflected the common free water policy followed then in many developing countries. Commercial and industrial customers continued paying for water, but the revenue applying low tariffs could only cover a small part of the operating expenditure of urban

water supply systems. During the period of development cooperation with the Government of Finland (1989–1996), there were concerted efforts to lay substantial groundwork for water policy development and institutional reform. A national water policy was drafted, the urban water supply rules and procedures updated, new water resources legislation drafted, sustainable tariff proposed and prepared, and legislation drafted for introduction to the parliament (cabinet paper) on (1) establishment of an autonomous water supply authority, (2) reintroduction of domestic water charges, (3) approval of the national water policy, and (4) other legislation including water resources management and urban water supply rules. Unfortunately, the results were not fully achieved, because there was not enough political will and commitment towards implementation of the proposed policy and institutional reforms. The failure to undertake the reform indicated that the constraints, risks and impacts of the political economy were not adequately considered. The situation is almost similar to what happened with Pakistan's reform efforts (Dinar, Balakrishnan, & Wambia, 1998).

However, based on the assumption that the intended reforms would be successful, positive scenarios were developed for the future development of Zanzibar urban water supply. Prospects for economically viable urban water supplies were good (Seppälä & Katko, 2002), although the need for cross-subsidies was recognized. While the political environment in Zanzibar and Pemba may be described as very problematic even in the African context, the failure of the reform process clearly underlined the critical need for political maturity and commitment towards reform. It is important to note that the main political resistance came from leading politicians and decision-makers themselves, not from the people and customers. Citizens seemed to recognize the necessity of the reform and its expected impacts on the water service, but the ruling party considered that reform components such as the reintroduction of domestic water charges would benefit the opposition in the sensitive pre-election situation of 1995. WSS professionals did train and educate politicians on the institutional issues of water sector, but obviously the capacity building effort among the decision-makers was not adequate. In 2002, the institutional situation with Zanzibar urban water supply remains largely the same while the operational status of water supplies has deteriorated even further. Minor technical improvements have been achieved in rural water supply through external assistance. It is likely that there will be no substantial positive development without another institutional and policy development support project by donor agencies. Yet, the stubborn political stalemate between the two main political cadres has to be solved prior to any external reform attempts.

2.3.4. *Sri Lanka and South Africa*

Some of the recently launched national water policies can be considered relatively comprehensive and fairly systemic in their approach. Sri Lanka and South Africa are examples of well implemented water policies and policy development processes.

Sri Lanka has recently formulated its new water policy with support from the Asian Development Bank (ADB), Food and Agriculture Organization (FAO) and International Water Management Institute (IWMI) in connection with the project on Institutional Strengthening for Comprehensive Water Resources Management (ISCWRM). Sri Lanka already had long experience from river basin planning, while water sector responsibilities were still divided and fragmented between the union and provincial governments (Saleth & Dinar, 2000). The new policy aims at restructuring water administration to strengthen coordination and management in

the water sector involving all uses of water. An inter-ministerial Water Resources Council (WRC) has been established. A National Water Act has been prepared, but not yet enacted. The legal reform aims to amend national legislation and regulations as well as the large number of existing water-related acts. Many experts have considered the Sri Lankan reform process and the new water policy to be relatively more systemic and comprehensive, but the success of their implementation still remains to be seen.

South Africa launched its White Paper on a National Water Policy in 1997 (DWAF, 1997). The National Sanitation Policy was launched in 1996. The National Water Act was enacted in 1998 to replace the previous water law of 1956. The new water act defines a modern legal system that is conducive to management decentralization, market-based water allocation, full cost recovery, and integrated water resource management (Saleth & Dinar, 1999, 2000; DWAF, 1997; Abrams, 1996). In addition, a new Water Services Act was launched in 1997. The South African water policy is more comprehensive and systemic than, for instance, the new water policy of Kenya. The South African water policy has more linkages to other sectors of society, while the Kenyan water policy focuses almost exclusively on water resource and water supply issues. Neither the South African nor Kenyan water policy is systemic and integrated in the sense that both largely ignore the sanitation sector. Fragmentation of the institutional structure is still apparent in both policies. The South African water policy also covers international aspects, but the Kenyan water policy is strictly limited to the national context. A special, but controversial, feature of the South African water policy is that it now includes the concept of “free basic amount of water”, which is intended to substantially improve access to water service by the poor (DWAF, 2001).

The process of policy formulation and its effective and participatory implementation is far more important than the contents of the policy document itself. Involvement of all stakeholders, especially ordinary people, in the water policy process is very essential. This has not usually been the case, except in South Africa.

3. Requirements for successful water policies and institutional reform

Policies as such do not trigger development, but a comprehensive approach is needed. Institutions matter—sustainable development should be rooted in processes that are socially inclusive and responsive to changing circumstances. To ensure appropriate implementation of policies, effective water-related institutions are necessary. The paradigmatic shift from water development to water allocation requires fundamental changes to reorient all three main components of water institutions (water law, water policy, water administration). It is relatively easy to formulate allocation-oriented water laws and policies, but more difficult to build an allocation-oriented organizational structure out of an existing water administration. An efficient administrative system is needed to translate the legislative provisions and policy intentions into concrete actions at the field level. An open and participatory process that gives precedence to economic, environmental and ecological issues and consensus is required (Saleth & Dinar, 1999, 2000). Institutional frameworks and arrangements require dramatic changes to enable the realization of the principles of Vision 21. While policies have been prepared in many countries, the lack of effective legal frameworks, implementing strategies and resources to execute these policies and actions continue to be a hindrance (IAP, 2000).

Some of the key requirements and approaches for success in water policy and institutional reform implementation are

- commitment of policy makers and politicians;
- institutional change and factors affecting it;
- institutional incentives, organizational incentives, and staff incentives and motivation;
- development of enabling “incentive environment”;
- integrated, comprehensive and systemic approach;
- effective stakeholder participation at all levels;
- effective communication and dissemination; and
- development of adequate capacity for implementation at all levels.

3.1. Political facilitation

Water policy development and reform is primarily a politically—not technically—driven process although high-level technical skills are a requirement for adequate and successful reform. Political endorsement and support are a key element of policy development while political will is needed in implementation. Although sector professionals should be strongly involved, no water policy innovation will succeed unless its political feasibility is ensured first. Much effort must be devoted to political facilitation of policy reforms, although technical, economic and other considerations are also important. Abrams (2000a) points out that politicians should be fully briefed about the implications and consequences of different policy options as well as the process of policy development. Institutional reform necessitates identification of the politically most acceptable reform strategy (Dinar, 1998). Without a high-level political mandate to undertake reform, it will generally not be possible to follow through with the necessary changes that will inevitably be called for in policy, legislation and institutional arrangements (Abrams, 2000b). It is also important to assess the political risks of institutional reform, including how various stakeholders will be affected by the reforms (Dinar et al., 1998).

However, political will to implement reforms is linked with socio-economic, demographic and resource-related factors, and depends strongly on the pressures from these factors. Thus, a serious water crisis or budget crisis can actually force a government to undertake reforms that are previously unacceptable and unthinkable politically.

3.2. Institutional change

Institutions (formal and informal) and institutional incentives are the underlying determinant of the long-run performance of economies (North, 1990). The three interrelated and essential components of water institutions are (1) water law, (2) water policy, and (3) water administration (Saleth & Dinar, 1999, 2000). Institutional change depends on (1) the stability characteristics of institutions, (2) the sources of change, (3) the agent of change, and (4) the direction of change and path dependence (North, 1990). Institutional change is a complicated process because the changes at the margin can be a consequence of changes in rules, in informal constraints, and in effectiveness of enforcement. Moreover, institutions typically change incrementally rather than instantaneously. In this incremental process, the short-term profitable opportunities cumulatively

create the long-term path of change. The differences between institutions and organizations, and the interaction between them shape the direction of institutional change. The tension between formal and informal institutions drives institutional change (North, 1990). When formal rules are inconsistent with the informal constraints that guide individual behavior, the unresolved tension between them leads to long-term political instability. Resolving the tension will always be slow, because all institutions resist change. Informal institutions, however, are more resilient than formal ones (Hukkinen, 1999). Institutional changes can occur when the opportunity costs (potential net gain) of the institutional change exceed the corresponding transaction costs (Saleth & Dinar, 1999, 2000).

Sound policy making is a prerequisite for institutional change and for successful water policy implementation. Institutional change can trigger a successful policy reform. Good policy documents (policy statements) as such do not ensure successful implementation of a policy. Action plans and strategies to implement policies should be realistic in terms of timing and resource allocation and utilization. Fundamental institutional changes to reform the water sector may be achieved through an integrated approach through inter-dimensional synergy. Yet, institutional changes are often incidental reactions to narrow and compromised concerns. The conflicts between environmental objectives and water-use demands are complicating the modernization of water resource institutions. Institutions have evolved and address water quality and pollution concerns and protection of the environment (Frederiksen, 1992).

3.3. *Systemic approach*

Integration of water policy with other sector policies is very important. A water policy cannot function in vacuum, but in continuum with other sectors of society. Policies should be used as a basis to develop a water resources framework that accounts for the future needs of all water-use sectors, including the environment. Increased water scarcity, competition and awareness lead policy makers to recognize the need for comprehensive water policy approaches. Transboundary water issues and water conflict resolution have become an integral part of water resource management policies. As water resource policies are being modified in order to accommodate comprehensive and sustainability issues, there is an emerging need to address increasing information and coordination issues (Dinar, 1998). Integrated water resource management (IWRM) has been emphasized as a systemic approach to water sector development, but it may not as such provide solutions to WSS sector paradigms (Ghosh, 1999). Domestic WSS has always been considered a sub-sector of water resource management, and has therefore been perceived as an engineering-oriented problem. An adequate balance should be achieved between the WSS sub-sector and the water resources sector.

The systemic approach according to the Iguacu Action Programme (IAP, 2000) should include acknowledging hygiene, sanitation and water as a human right, and relating it to human development, the elimination of poverty, environmental sustainability and the integrated management of water resources. A systemic approach was aimed at in the World Water Vision process, where an effort was made to integrate different vision-components (water for people, water for food, water and nature). The success of integration remains debatable. Moreover, the framework for action (FFA) related to vision implementation lacks integrity between the various components.

It is unlikely that we can solve all the future problems now, and there are a lot of uncertainties about the future. Policies and strategies should be developed as part of the systemic approach considering diversity and complexity of the issues to make them flexible towards the future. WSS services are human activity systems that are dealt with in an extremely complex institutional environment. Systems thinking could provide a means to comprehend and rationalize the institutional environment. Soft Systems Methodology (SSM) (Checkland & Scholes, 1999) is a general and flexible theoretical framework for problem solving in real-world situations and can be used to tackle complex ill-structured problems in human activity systems. The application of SSM to the water policy and institutional reform process would actually provide powerful tools to incorporate systems thinking and futures approach in a systemic manner. Other systemic decision-making analysis tools, such as PESTE and RESPECT, should also be used in addition to SSM.

3.4. Stakeholder roles and participation

The roles and responsibilities of various stakeholders need to be given adequate attention in the reform process. Unless real involvement, participation and facilitation of stakeholders at all levels occurs, water policies and proposed institutional reforms remain white elephants which are rarely, if at all, implemented. In the institutional and policy reform process the stakeholders include decision-makers, politicians, administrators and sector professionals, users (customers) and community groups, commercial and private sector, non-governmental organizations, advocacy organizations and other interest groups (environmental, etc.).

The main participants in the process include the government, non-governmental and individual stakeholders. In most developing countries, the role of the central government in water management has been far too dominating in the past, especially in financing and service provision and production. The appropriate role of governments is to provide enabling environment and leadership role in defining a national policy framework and to coordinate investments. Public agencies should continue to bear responsibility for issues such as initial allocation of water, regulation and monitoring (e.g., water quality). Public agencies are probably better at operating and maintaining large, multipurpose systems (Dinar, 1998). Yet, private sector should play an increasing role in the production of various services, in partnership with the public sector and non-governmental organizations. Networking of stakeholders is also important.

The institutional decision-making process should be geared to putting people at the center of water reform efforts, as strongly emphasized in the Iguacu Action Programme (IAP, 2000) of the Water Supply and Sanitation Collaborative Council (WSSCC). The Vision 21 document of the World Water Vision (Vision 21, 2000) also emphasizes the key point: “People come first!”. Demand Responsive Approach (DRA) should be applied also to institutional reform, not only to service provision at the grassroots-level.

Dissemination of policy messages to the people and grassroots is equally important. Commitment of users/communities is essential, otherwise policy will not be operationalized in the field. This is demonstrated also by the experiences from Kenya, where grassroots-level dissemination of the new water policy still faces enormous challenges.

3.5. *Capacity building in water policy reform*

Preparing and designing sustainable and comprehensive water and sanitation policies is extremely important. Yet, it is equally important to build the capacity of sector professionals, civil society and communities to understand and commit to the new policies. In developing countries policy and institutional changes have in many cases been pushed through too rapidly, without adequate consideration for the transition and build-up of adequate capacity. This is the case, for instance, when the capital cities of developing countries grant water concessions. In many cases inadequate attention has been given to the capacity building needs of the regulatory structures in the reformed institutional and administrative framework. In the past, the capacity building support to policy development by the donor agencies has focused mainly on water resource management and only marginally on the water and environmental sanitation sector (Ghosh, 1999).

It is a huge challenge for sector organizations to disseminate policy messages to the field and to gain practical results in implementation of the policies and strategies. Capacity building in water policy implementation is important at all levels. Training top-level decision-makers is not enough, huge efforts are also needed to train and build the capacity of lower-level employees and grass roots. The case from Zanzibar shows that political acceptance of the reform process is imperative and could be achieved through capacity building of political decision-makers.

Among other actors, the World Bank Institute (WBI) has been active in water policy capacity building. WBI's Water Policy Capacity Building Program has helped countries build capacity and make policy choices leading to sustainable water resources management and water services delivery. The Program has developed expertise in helping policymakers understand the options and modalities of reform through the dissemination of international experiences and best practices. It is commendable that the World Bank Institute is expending strong efforts to build capacity with the aim of strengthening and reforming the public sector institutions. The World Bank's current main policy, on the other hand, seems to stress privatization and public-private partnerships (PPP) as a remedy for water services production more or less universally.

4. **Future institutional framework**

It is not possible to present a clear-cut institutional framework that would be best for all regions and countries. An enabling and empowering policy environment and institutional structure are nevertheless a universal requirement for success. Institutional and policy issues have to be dealt recognizing the specific differences at the international (global), national and local levels. In the future institutional framework specific features and conditions of a country have to be considered. The following general ideas and observations are partly based on the findings of the author's ongoing research work '*Visionary management of water services: Reform and development of institutional framework*'. These findings and initial hypotheses will be further developed and refined during the research project through substantial inputs by sector professionals participating in Delphi surveys. In the future, the systemic 'institutional landscape' should include the key elements in a balanced manner, to enable development of viable water and sanitation services.

Some of the interlinked key elements of the future institutional framework and viability are

- (1) Appropriate water and sanitation policies and strategies formulated and implemented through a systemic and participatory process (providing ground for appropriate legislative and administrative reform).
- (2) Institutional and organizational strengthening, including capacity building and human resources development.
- (3) Effective economic instruments and financing (including access to finance, financing mechanisms, cost recovery and appropriate services pricing, tradable water rights).
- (4) Appropriate stakeholder roles and participation (including public–private partnership, community management, customer orientation, ownership, and regulation).
- (5) Futures thinking, visionary leadership, and visionary utility management.

4.1. Appropriate policies

The issues and elements of appropriate water policy and the process to formulate and implement it have already been discussed in previous chapters. It is assumed that by 2010, all countries will have adopted a statement of water management principles either through a water law or a national statement (water policy), from which all subsequent actions will be derived (Catley-Carlson et al., 1999). The top priorities will be: (1) the quality of human existence, and (2) ecological protection. All other concerns will be incorporated, but remain subsidiary to these two principles. Donor organizations may (be needed to) continue assisting developing countries in formulating and implementing water and sanitation policies, but their role should become rather facilitative than dominating. Policy processes should be more innovative, participative and committing, contrary to past processes that have been fairly oppressive and project oriented.

4.2. Integrated water resource management

The increasing complexity of water resource management has forced most countries to modify old and devise new water institutions. The principles of sound water resource institutions can be grouped into: (1) water resource ownership, allocation and rights, (2) standards, regulations and administrative rules, (3) government and non-governmental responsibilities and organization, and (4) financial institutions (Frederiksen, 1992). Decentralized allocation of water resources will become more important with increasing demand on water resource (water stress and localized scarcity). As emphasized in the Dublin principles, water resources planning should be regional, but management and action local: “Think globally—act locally!”. The river basin will become a natural unit of water management as indicated by the new EU Water Framework Directive, although river basin thinking actually does not fit all circumstances well.

4.3. Stakeholder roles and participation

Promotion of institutional reform, good governance and capacity building of public sector agencies advance the engagement of all sector stakeholders including the establishment of public–private partnerships and the implementation of institutional arrangements supporting sanitation (IAP, 2000). The present trend and fashion is to condemn publicly managed and operated water utilities as

inefficient and non-viable in general. The fact is that many of these, especially in the developing countries, have not been able to serve their purpose properly. The panacea for improving the situation has of late been privatization or increased private sector participation. It is true that effective stakeholder participation is required, and PSP definitely brings added value in most cases. Yet, public organizations can also work effectively and efficiently when properly managed, and they can be made to improve their operations. In addition to public-private partnerships, we should also promote *public–public partnerships* (for instance through twinning arrangements) and *private–private partnerships* (including strengthening local private sector capacity within concession contracts). There should be a diversity of institutional and management options.

In countries such as Finland, Sweden, the Netherlands, and Germany, publicly owned and managed water and sanitation utilities have performed in a very satisfactory manner. There public management means mainly municipal or local government in contrast to management by the state or central government in most developing countries where failures have been reported. Municipal or local-government management and governance is not yet operational or strong in most developing countries. Decentralization is yet to be extended. Yet, in countries where municipal organizations already have adequate working momentum, ownership, management and operation of water and sanitation utilities should preferably be arranged through local government.

Private sector participation will be necessary also in cases where ownership and strategic management of utilities remains with the municipalities. A promising concept in future could be areal/regional operation, where several municipally owned utilities make management and/or operational contracts with a private operator. This concept will be tested, for instance, in Finland in the regional operation of wastewater treatment plants.

4.4. *Regulatory framework*

Regulation and effective regulatory framework will become increasingly important in the future, whatever mode of management and operation will be selected. The transition from centrally managed state organizations to decentralized public and/or privately operated services is difficult for many developing countries. This is due to the general lack of qualified sector professionals and the difficulties they face in shifting from service provision to supervision and regulation. Donor organizations should increasingly assist developing countries to set up their regulatory structures and build regulatory capacity. Yet, regulation should be as lenient as feasible; developing countries do not need and cannot afford heavy over-regulated systems such as those in England and Wales.

4.5. *Futuristic thinking and visionary approach*

Water policy and institutional development need more futures orientation. Systems thinking and futures research methodologies provide useful tools for dealing with complex human activity systems related to water and sanitation sector institutions. Decision-makers and political leaders also need visionary leadership skills, not only professionals who formulate policies and strategies. Futures research must address the problem of how to minimize transaction costs of institutional reforms, since all institutional arrangements do not actually lower transaction costs (Carruthers & Morrison, 1996). It is necessary to discover a strategy for the reform of water institutions

involving minimal transaction costs and maximum political acceptability to promote operational linkages among various components of water institutions as well as the ultimate impact of such institutional linkages on overall water sector performance (Saleth & Dinar, 1999).

5. Conclusions

The concept of appropriate water policy is not universal and cannot be generalized. Water policy must be appropriate to the social and economic context in which it is implemented. An enabling environment and institutional framework are a prerequisite. Policies and strategies of international and donor agencies have been fashionable but not holistic enough. Earlier only few developing countries had water policies, but recently many have formulated policies and are implementing a reform process. Policy and institutional reform processes in developing countries have been too project-oriented and donor-driven. Thus, implementation of water policies and subsequent institutional reforms has generally not been very successful. Policy documents may be theoretically good, but the process of formulation and implementation often fails. Fig. 1 summarizes some of the main constraints and impediments to the reform of water institutions and policy implementation and outlines the key response areas that need more emphasis in future policy processes. Fig. 1 does not strive to point out the linkages and sequences between impediments and remedies in an exhaustive manner, but merely to illustrate the complex and interrelated nature of impediments and their effects.

To ensure successful implementation of policies, effective water-related institutions are necessary. These water institutions—broadly understood—include policy, legislation, administration, and informal institutions. Key requirements and broad areas of improvement in successful policy and institutional reform process include:

- Political facilitation and will (consensus vs. conflict);
- Institutional change and incentives to trigger the reform process;
- Systemic and integrated approach, recognizing interrelations of sectors;
- Futuristic and prospective thinking (including decision-making tools);
- Recognition and participation of all relevant stakeholders to ensure commitment;
- Capacity building of stakeholders at all levels (including regulatory capacity);
- Effective communication and dissemination to operationalize policies and reforms in the field.

It is not possible to develop a clear-cut institutional framework that is universally applicable to all regions and countries. It has to be tailored according to the specific features and conditions of each country. We have a diversity of options and should apply them in an unprejudiced and innovative manner, instead of impetuously reproducing the same fashionable models everywhere. Institutional and policy issues have to be dealt recognizing the specific differences differently at the international (global), national and local levels. In the future, the systemic ‘institutional landscape’ should include the key elements of the institutional framework in a balanced manner to enable development of viable water and sanitation services. According to the author’s hypothesis the interlinked key elements include: (1) policy and strategies, (2) institutional and organizational strengthening, (3) economic instruments and financing, (4) stakeholder roles and participation, and (5) visionary futures thinking.

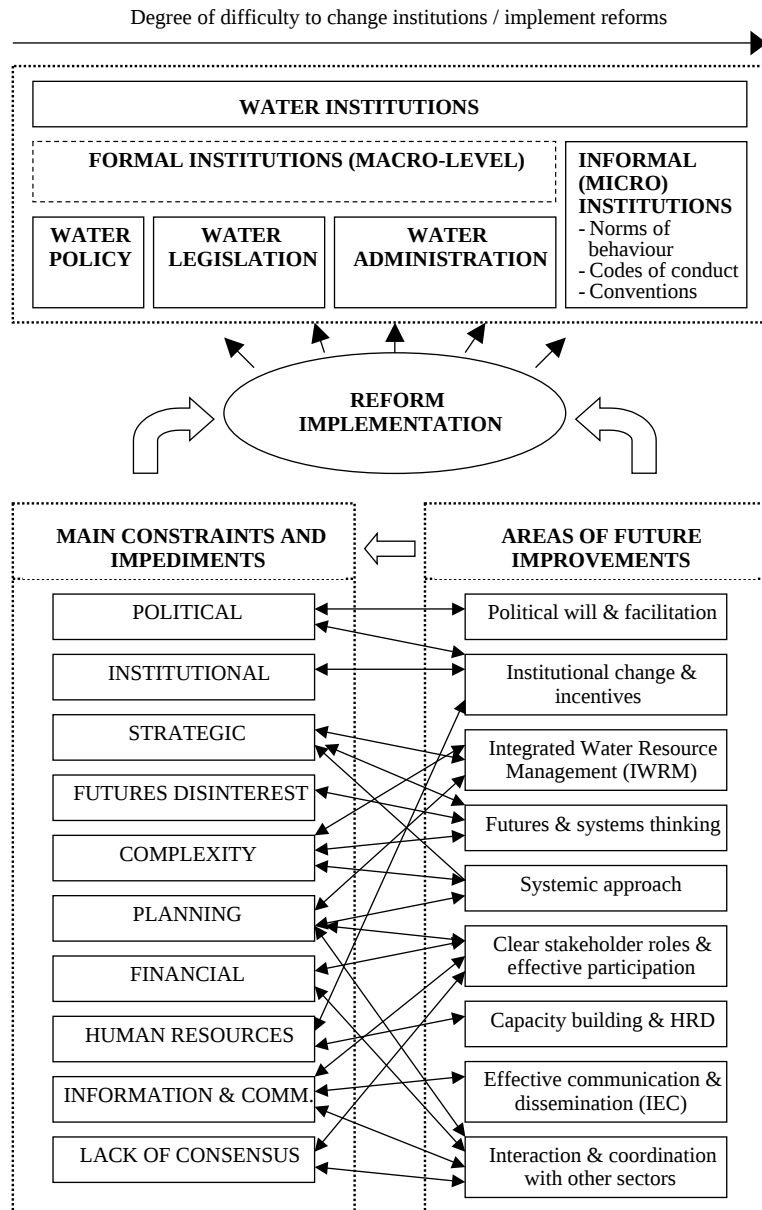


Fig. 1. Major impediments to policy and reform process, and required interlinked areas of action to improve successful implementation.

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ARTICLE II

Seppälä, O.T., Hukka, J.J. and Katko, T.S. 2001. Public-private partnerships in water and sewerage services: Privatization for profit or improvement of service and performance?

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TECHNIQUES, CASES, & ISSUES

PUBLIC-PRIVATE PARTNERSHIPS IN WATER AND SEWERAGE SERVICES Privatization for Profit or Improvement of Service and Performance?

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There is no empirical proof that private enterprises manage and operate facilities more efficiently than public ones. Instead of privatization, it is better to promote viable public-private partnerships and commercialization of services. The core businesses of water and sewage works should preferably be retained by a municipality-owned enterprise. In the selection of the mode(s) of water service implementation, one must consider the nature of the services, the long-term experiences, and transaction costs. The nature of water and sanitation service activity itself requires that long-term development should be considered in decision making. The institutional framework must be such that all parties benefit from cooperation. Whichever management or contract model is selected, the ownership of the utilities should preferably remain in the hands of municipalities whose decisions on services citizens should be able to influence through local democracy. The responsibility for arranging water services lies de facto with the public sector.

International interest for privatization of public water and sanitation services has increased strongly since the mid-1990s. This article is based on the authors' recent research on privatization and public-private partnerships. *Public-private partnership* is here understood as a wide concept that includes outsourcing of noncore services and operations. The study has charted international experiences from privatization through literature reviews and direct contacts with researchers and water industry colleagues in for instance England, Scotland, Sweden, and the United States. The authors' memberships in international professional associations—particu-

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larly the American Water Works Association (AWWA), the International Water Association (IWA), and the International Water Resources Association (IWRA), and related specialist groups and task forces—have also been used. The research approach is a combination of engineering sciences, development studies, institutional economics, and futures research.

Although history does not necessarily repeat itself, surprisingly heated debates were held already in the late 1800s and early 1900s in the developed world about the roles and cooperation between the public and private sectors in water services as well as the organization of such services. This fact has been ignored almost completely in the international debate of the 1990s. The recent debate is based mainly on two concerns: (a) perceived inefficiency and inadequacy of the public sector to mobilize the required financial resources for investments, especially in developing and transition economies, and (b) claims of encouraging privatization experiences in some other technical utility services. One reason for the increased private sector involvement is that many companies, foundations, and other organizations with substantial financial reserves are considering water services as a prospective business investment with guaranteed profit and low risks. Indeed, the interest for both investor-ownership and private operation of water services is growing. This international “privatization boom” is also backed by international financiers such as the World Bank and the European Bank for Reconstruction and Development.

Although private sector involvement and the privatization boom obviously is one of the biggest policy changes in the water sector for some time, analytical discussion and scientific research on the issue seems still to remain limited. The public discussion is mainly based on intuition and prejudice, and scientific reasoning has been scarce.

The Last Natural Monopoly?

Since telecommunications, energy, and electric utilities have already been restructured and privatized in many Western countries, water and sanitation services have been called “the last monopoly.” Water utilities are unique among public utilities and have been considered perhaps the most monopolistic. Yet, economic regulation of water utilities is limited and varying. Water technologies and economies cannot be restructured along the lines of, for instance, the telecommunications and energy industries. This is because the water industry has not experienced major technological breakdowns or come close to exploiting economies of scale in management and operations as other utilities did before restructuring. Long-distance and open-access transmission is particularly problematic and costly for water (Beecher, 2000).

Privatization objectives are often coupled with the task of exposing an existing monopoly to competition. Yet simply converting a publicly owned monopoly into a privately owned one on grounds of equity, efficiency, justice, and freedom may not be desirable. Privatization should promote competition wherever possible. This can be done by (a) removing all legal and regulatory impediments to the emergence of potential private rivals and (b) facilitating arrangements that allow exclusion (e.g., control of free riding). In many instances, technical progress has facilitated competitive supply where this was not earlier possible (radio, TV, telecommunications, electricity, train operators, etc.) (Kasper & Streit, 1998). The main options for private sector participation in water services (see Figure 1) can be categorized according to how they allocate responsibility for issues such as asset ownership and capital investment between the public and private sectors. In practice, options might also be used in combination; for example, a build-operate-transfer (BOT) contract for bulk water supply might be combined with a management or lease contract for operating the distribution system.

Water supply and sanitation systems are categorized as natural monopolies due to the nature of the required investments and technical systems. It is not feasible to construct several parallel networks and facilities in the same service area. The sunk costs of the major infrastructure investments in the water supply and sanitation sector are significant and do not justify duplication of infrastructure. It is rarely possible to introduce side-by-side competition into a particular service area by uncoupling source of supply from distribution (Werkman & Westerling, 2000). Yet, based on experiences from other sectors (electricity, telecommunications, etc.), increasing

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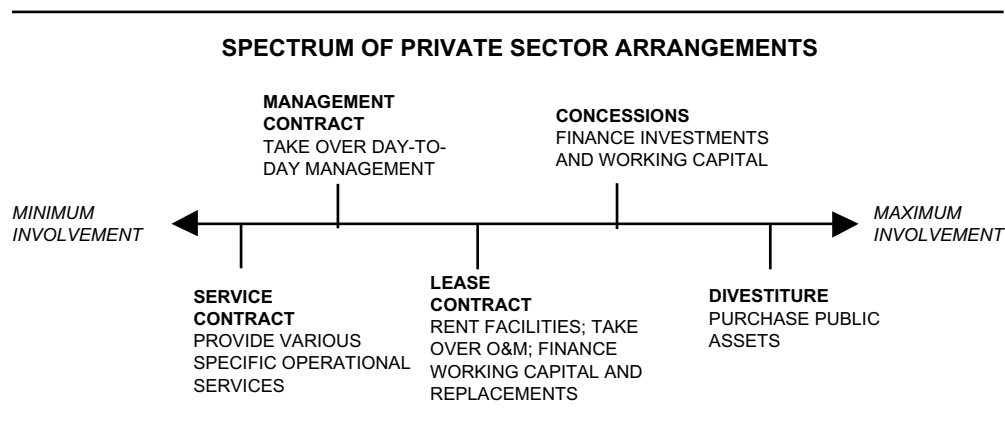


Figure 1: Main Options for Public-Private Partnerships in Water Services

SOURCE: Water and Sanitation for Health Project (1992).

NOTE: O&M = Operations and management.

demands to introduce more competition into the core operations of water utilities have been made.

Recently, the new Competition Act of England and Wales has introduced an artificial form of competition in England and Wales that allows competitive service producers access to common water and wastewater networks. This principle of common carriage aims at providing greater choice of suppliers for customers without necessitating the duplication of infrastructure. Common carriage refers to “the introduction of raw or treated water by a new entrant at an appropriate point in an existing statutory water undertaker’s system in order to supply water at other points in the system to customers of the new entrant” (Drinking Water Inspectorate [DWI], 2000).

Yet there are a number of concerns related to common carriage. These include safeguarding water quality, liability issues, emergency procedures, supply security in terms of pressure and flow rates, access charges, metering, and leakage. The DWI (2000) of England and Wales has issued extensive guidance on drinking water quality aspects related to common carriage. However, there is a serious concern that customers might experience unacceptable deterioration in the quality of their drinking water due to complicated hydraulic and other technical conditions of the water service in common carriage.

The electricity supply sector has been considered most analogous to water utilities. Finnish electricity supply was liberalized toward the end of 1990s. Competition in electricity distribution takes place according to many of the same principles as the proposed common carriage in the British water sector. Yet most Finnish electricity providers are still municipal public enterprises and not private electric companies. Through increased choice of service producers, customers have been able to lower their electricity bills. Yet in electricity supply, concern for service quality and other customer perceptions are not as significant as in water supply, mainly because the product is very different by nature. With time, the fundamental differences between water services and electricity services will be better understood.

Common carriage will be applied mainly in drinking water services. Yet in the future, water and sewerage services will have to be considered more as an integrated service. Thus, doubling of institutional arrangements should be avoided. Due to the unique history and nature of the British water industry, common carriage may become a successful competition instrument for England and Wales but may not be a feasible solution in other countries. For instance, in Finland common carriage would probably cause water quality problems for systems that use both ground and surface water.

The Higher Efficiency and Effectiveness of Privatized Utilities: Is It a Myth?

It has become a common belief that privatized water utilities have greater efficiency and effectiveness than public water utilities, which have been labeled as inefficient and ineffective. Yet, efficiency and effectiveness depend completely on the applied criteria. Neoclassical economic theory assumes that the perfectly competitive market provides the best mechanism for achieving efficiency. However, this theory fails to provide an analytical framework for the complex human interaction that affects the performance of economic organizations.

Institutions and institutional change are the underlying determinant of the long-run performance of economies (North, 1990). Neoclassical and institutional economics have a different understanding of economic performance. The standard neoclassical conditions apply to allocative efficiency and assured rational behavior but not to adaptive efficiency. Adaptive efficiency provides the incentives to encourage the development of decentralized decision-making processes that will allow the maximization of those efforts required to explore alternative ways of solving problems (North, 1990).

When transaction costs are fully considered, efficiency and economic performance are seen to play a different role in today's privatization analysis. Economic and technical (operational) efficiency is only a narrow indicator of the performance and viability of a water utility. Viability is a holistic definition that can be used to assess the performance of water utilities. Viable water systems are self-sustaining and can reliably meet all present and future requirements in a dynamic, comprehensive manner that assures the continued delivery of safe water. The key factor in viability is the capability of a system to implement the changes indicated by its own planning process (American Water Works Association [AWWA], 1995). Hukka (1998, p. 129) has presented a viability monitoring and assessment system that is a vital component of a comprehensive capacity development system. Its basic task is to produce information on the water system's financial, technical, and operational ability to meet all present and future requirements in a manner that assures the production of safe, sufficient, and affordable drinking water as well as customer confidence and satisfaction. One key tool for such a viable system is a master plan that includes a facilities plan, a management plan, and a financial plan, all of which should show how the system meets (and will continue to meet) performance requirements (AWWA, 1995).

The only relevant and objective way to assess the performance of a public organization is to measure how well it can meet set goals and objectives (R. Rees, 1984). Generally, the objectives of public water utilities are based on enhancing operating efficiency and long-term sustainability, with emphasis on full cost recovery instead of profit maximization. The quality of the service to customers, health, and environmental considerations are very important for public water utilities. Financial viability is dependent on the stability of operating conditions. This viability can be measured by a system's ability to bring in more money than it spends to provide reliable water service (AWWA, 1995).

Competition requires greater efficiency and effectiveness. Institutional regimes for water services face three kinds of efficiency problems: (a) inefficient levels of output, (b) inefficient levels of cost, and (c) inefficient levels of product quality (Brook Cowen & Cowen, 1997). It has been claimed that privatization can substantially reduce the operating costs of publicly owned and operated agencies through infusions of capital investment, improved work practices, and more efficient purchasing and other services. According to Brubaker (1998), several U.S. experiences indicate that privately operated water utilities should save costs and be more efficient than public operations.

In reality, however, there is no scientific evidence that fully privatized utilities operate more efficiently and effectively than public utilities, and performance improvements could also be achieved by good public management. Willner (cited by Lehto, 1997, pp. 23-50) has made an extensive literature review covering about 50 scientific articles. His conclusion is that public ownership is usually not less efficient than private, and in many sectors (including electricity,

Neoclassical economic theory fails to provide an analytical framework for the complex human interaction that affects the performance of economic organizations.

Viable water systems are self-sustaining and can reliably meet all present and future requirements in a dynamic, comprehensive manner that assures the continued delivery of safe water.

insurance, railways, and water supply), it actually performs better. The economic benefits assumed to derive from private companies taking over public services are grounded in the belief that private operators manage more efficiently, are more technically advanced, and invest capital. In practice, the main savings are achieved by cutting labor costs either by reducing the number of jobs or by lowering salaries and conditions (or both) (Martin, 1996). Yet downsizing can potentially reduce service quality and customer satisfaction.

Efficiency and effectiveness can be measured, for instance, by using performance indicators and benchmarking against agreed indicators both in the private and public sector. In their comparison of several public and private water utilities, Lobina, Hall, and Finger (1999) concluded that privatization seems to be overvalued as a factor of enhanced effectiveness and productive and allocative efficiency.

In England and Wales, customer water charges have increased twofold on average since the 1989 privatization there. During the same period, the private water undertakers' profit has increased 50% to 700% and their managers' average salary and benefits at least fivefold (Martin, 1996). The huge profits and salary increments indicate that the tariff increases have not been introduced merely to recover costs but to earn profits for the private owners. This is also corroborated by the substantial investments and expansion of the water companies into sectors and businesses other than the water industry.

Publicly owned water utilities have also been labeled as inefficient in securing required financing for investments. Yet, publicly owned water utilities can, in principle, access the same sources of finance as multinationals (local banks, international banks, multilateral institutions, state or international grants). Private finance is usually dependent on guarantees by local and central governments and ultimately on end-user charges or taxation. Privatization may also imply hidden taxation. Private ownership or private financing (shareholding) does not as such make water services any more efficient if the private sector does not bring additional professional competence to complement that of the public utility.

Only Lenient Regulation Is Necessary

Water services are typically considered a natural monopoly and therefore cannot be allowed to operate in completely unregulated markets. If there is no competition, regulation is necessary. An important question is whether privatization requires regulation or deregulation. Deregulation will pressure the water industry to change its rules of engagement as well as the roles of water utilities. According to Beecher (2000), deregulation may not currently be good for the water industry. Deregulation puts enormous faith in markets. Yet persistent and significant market failures (monopolistic tendencies, negative externalities, and inequitable outcomes) will be the inevitable consequences of an overreliance on markets for the management of drinking water services. Appropriate regulatory reform to ensure accountability would be better than deregulation. When the services have already been privatized, the public interest can best be ensured by restructuring and regulating the private sector.

In England and Wales, one of the main reasons for privatizing the regional water authorities was that the government would then not need to get involved as extensively and expensively in water affairs. The original objective was to introduce full privatization with maximum deregulation. Yet in view of both (a) the strength of this natural monopoly and (b) the importance of the social and environmental impacts of water supply and wastewater management, the key to effectiveness has been ensuring that private sector involvement is coupled with strong and competent regulation (Summerton, 1998, p. 65). Gradually, the intended deregulation in England and Wales has been replaced by extensive public regulation, which has eventually led to a very complicated and overregulated system. The new Utilities Bill of England and Wales and the increased requirements of the new common carriage practice there in both economic and public health regulation and control will complicate the regulatory framework and practices even further. Governments have performed poorly as owners and regulators of water utilities (especially in developing and transition economies) partly due to a lack of experience and partly due to

Private ownership or private financing (shareholding) does not as such make water services more efficient if the private sector does not bring additional professional competence to complement that of the public utility.

improper incentives and corruption. Brook Cowen and Cowen (1997) have proposed that unregulated private monopolies might be a feasible alternative for developing countries. This option of complete privatization of water assets and unregulated natural monopoly would involve no price regulation, no rate-of-return regulation, and no surreptitious regulation through antitrust law (i.e., a laissez-faire antitrust policy). An unregulated private monopoly would have an incentive to bring as many potential buyers into the system as possible to maximize profits. It is believed that this would significantly increase the number of water connections in developing countries. Yet, there are several potential problems with unregulated privatized monopolies in water services: (a) equity and distributional objectives (partial exclusion), (b) bargaining and rent-seeking costs, (c) potential price gouging, and (d) the imperfect ability of governments to precommit to a laissez-faire regime (credibility) (Brook Cowen & Cowen, 1997).

J. A. Rees (1998, p. 29) has concluded that unregulated water and sanitation companies are simply not an option. There are many major regulatory tasks needed to ensure various forms of customer protection in privatized water service arrangements (p. 22). The social, developmental, and environmental importance of the water sector means that continued public regulation will be necessary. Governments cannot escape their responsibilities in the water sector.

Brubaker (1998) has proposed privatizing the regulation of water services as an alternative to central government-level or river basin-level regulation. She is convinced that resource use should be managed and also regulated at the lowest reasonable level. Restoring and applying property rights to water would partially privatize regulation, but it would not actually mean deregulation. Property rights should not replace all central regulation either. Private regulation (citizen regulation) is most likely to succeed best in systems in which financing, ownership, and operation of water services have also been privatized (Brubaker, 1998).

In conclusion, it seems inevitable that with all institutional options—public, privatized, and mixed—regulation will be required and needs to be applied. Yet regulatory control should not protect and limit market mechanisms but facilitate them. Competition and creation of a functioning market requires appropriate, sector-specific regulation and an independent, strong regulator.

Restoring and applying property rights to water would partially privatize regulation, but it would not actually mean deregulation.

Transaction Costs May Be Significant

Transaction cost theory emphasizes transactions and management of economic contractual relations. Transaction costs include expenses resulting from two or more parties entering into business relations. They are related to such factors as planning, decision making, negotiations, contract supervision, arbitration, and arrangement. Transaction costs also include losses due to poorly prepared plans and contracts. In transaction cost theory, the company's relationships to suppliers, customers, shareholders, and staff are explicitly or implicitly bound by contracts or agreements (Williamson & Masten, 1999). Various levels of insecurity pertain depending on the conditions of business transactions. The key criteria for these levels are asset specificity, insecurity (in business transactions, due to uncertainty or inaccuracy of agreements), and a small number of contracting partners.

Uncertainty and lack of information are the central elements of transaction costs. They are incurred because people are not able to organize steady and stable conditions for their business relations based on their observations and limited information and knowledge. Such limitations are caused by incompleteness and unavailability of information as well as by difficulties in supervising and enforcing agreements and contracts. Transaction costs may be costly to measure and predict because (a) complex technical properties, timing, guarantees of private contract performance, and provisions regarding action in cases of nonperformance have to be monitored, and (b) it must be ensured that the agreed conditions are met to the satisfaction of both parties. If there is disagreement, possibly costly adjudication is required as well as contract enforcement (Kasper & Streit, 1998). Transaction costs are related not to project size but to the familiarity and stability of the policy environment. As governments gain experience and clarify policy, these costs will inevitably decrease (Klein, So, & Shin, 1996).

A contract to procure a specific service is characterized by complexity, special investments, contract period, and narrow market for alternative use.

When proponents of privatization of the water industry refer to the efficiency, effectiveness, and financial viability of privatized water utilities, they often ignore the importance of required institutional changes and related costs. According to the transaction cost approach, the asset specificity of the product or service is the main factor determining whether the service can be provided more economically and profitably by a private company than by a public organization. A contract to procure a specific service is characterized by complexity, special investments, contract period, and narrow market for alternative use. The lack of a comparative market means that it will be difficult to compare the economic efficiency of public and private provision of service (Williamson & Masten, 1999). The costs of service production are the sum of transformation (production) and transaction costs. Thus, only in the absence of transaction costs would the neoclassical paradigm yield the implied allocative results. With positive transaction costs, resource allocations are altered by property rights structures (Kasper & Streit, 1998, p. 28).

Figure 2 shows an example of the complicated and complex contract and agreement arrangements in public-private partnership in the water sector. Transaction cost implications of such complex arrangements are not always adequately considered and accounted for when efficiency is measured.

Contract agreements always tend to be incomplete. Problems of incomplete contracting are often relieved by unified ownership—by taking transactions out of markets and organizing them internally through vertical integration. Several examples and attempts to apply transaction cost economics to long-term contracts in various sectors clearly indicate the following:

1. Contracts always tend to be incomplete by nature, which may lead to hazardous contracts and inefficiency.
2. Contracting the services to a vertically integrated organization may seem to reduce transaction costs (by converting them internally), but in practice, competition does not exist.
3. Due to incompleteness and a long contract period, unforeseen developments may arise that call for a costly renegotiation or arbitration process between the contracting parties.

These characteristics apply well to long-term concession contracts in the water services sector. Institutions provide the structure for exchange that determines the cost of transacting and the cost of transformation. How well institutions solve the problems of coordination and production is determined by (a) the motivation of the players (their utility function), (b) the complexity of the environment, and (c) the ability of the players to decipher and order the environment (measurement and enforcement). According to Moody's Investor Services, public-private partnerships will remain extensively complicated and costly to set up: "Interaction among lawyers, contractors, the public sector, accountants, lending bankers, technical advisers, insurers and even rating agencies . . . rarely results in a quick and inexpensive financial closing" (Reina, 2000).

Competition for Monopolies—From Public to Private Monopolies?

Both public and private operations receive subsidies from many levels of government and from one another.

The privatization of a natural monopoly (as implemented in France, England, and Wales) does not increase competition; instead, a public monopoly is simply replaced by a private one. The French system is, in fact, heavily subsidized. Both public and private operations receive subsidies from many levels of government and from one another. The privatization of the delivery of services in France has not led to the privatization of the financing of services, which presumably was one of the intentions.

In France, private water companies generally charge higher prices than the public operators. This is perhaps mainly due to the limited nature of real competition within the French water sector. Three well-established companies hold greater than 96% of the contracts for water supply (Brubaker, 1998). Due to the strong vertical integration of the French private operators, actual competition occurs only during the tendering for the contracts of "bulk concessions." This situation comes up only at the end of the contract period—a period that may be as long as 30 years.

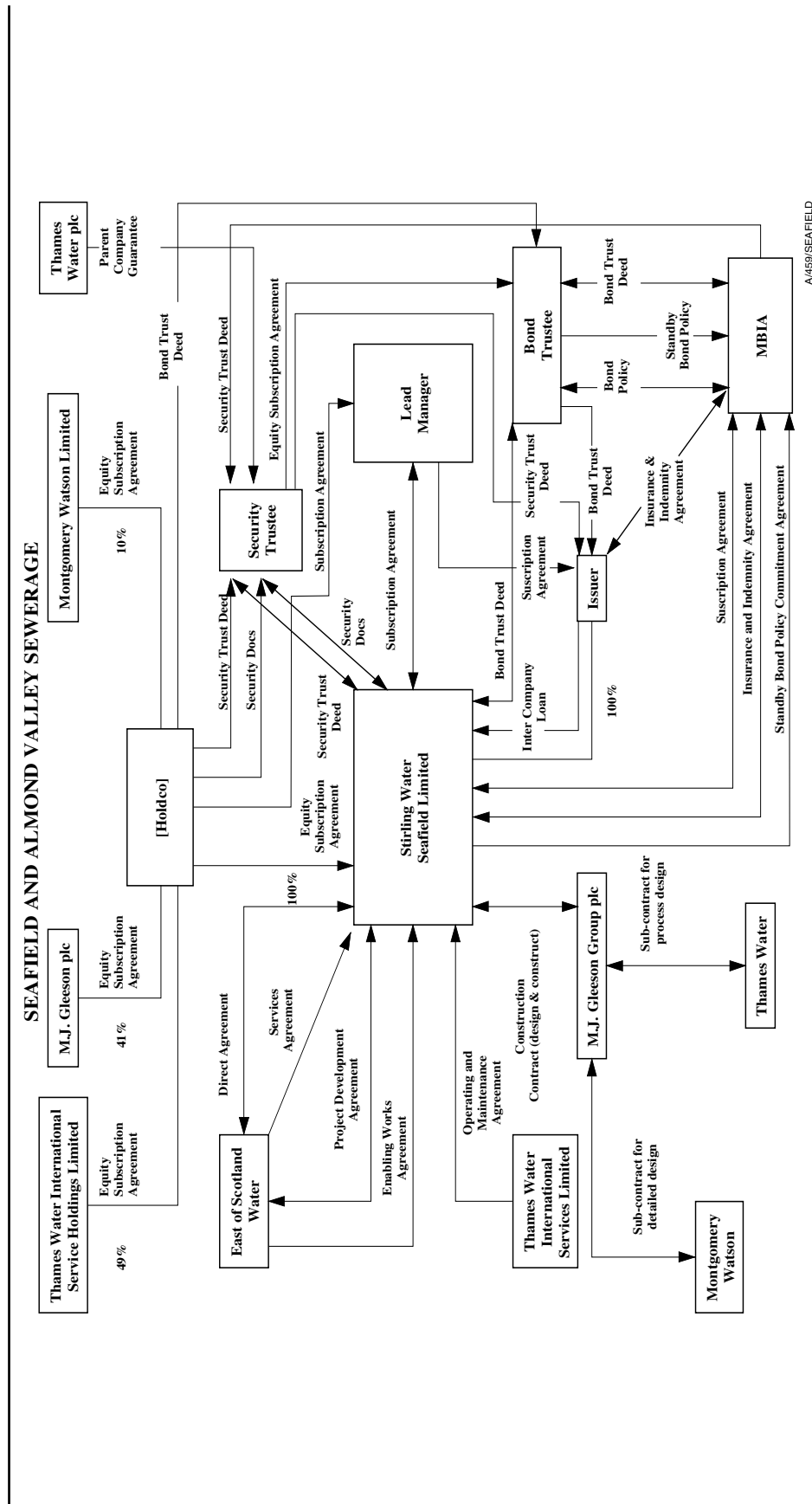


Figure 2: An Example of Complex and Costly Transactions in Privatized Water Supply Arrangements
 SOURCE: Nelson (1998), modified by authors.

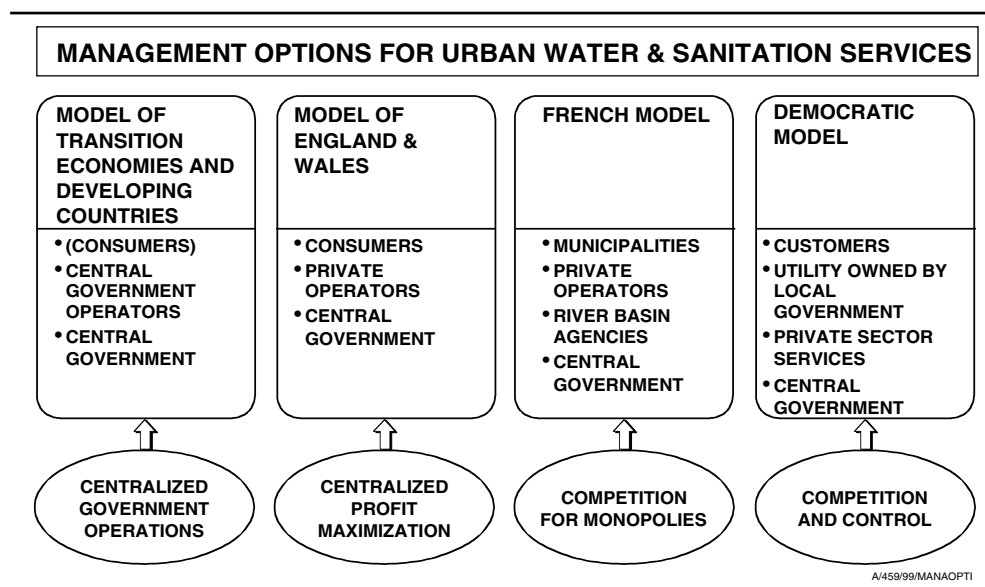


Figure 3: The Main Operational Concepts of Urban Water Supply
SOURCE: Hukka and Katko (1999).

In practice, long-term concessions tend to continue with the same companies, because other competitors may not be able to minimize risks based on inadequate information on the utility.

A public monopoly is more efficient than a private regulated one when the objectives are weighted properly (Pint, 1991). Unfortunately, there is no good solution for a technical monopoly. According to Milton Friedman, “we can only choose one of three evils: private unregulated monopoly, private monopoly regulated by the state, and public monopoly” (Williamson, 1985, p. 33). Transnational corporations (TNC) usually tend to squeeze out competitors in the domestic or export market (Martin, 1996, p. 147). The tendency of the few global private water operators to grow continuously in size and increase their vertical integration through mergers and smaller company sell offs will propel the trend toward private monopolies, with or without real competition for monopoly services. In the most attractive field of potable water supply in large cities, private monopolies with limited competition seem to be inevitable. Yet these mega-operators may not find it feasible to enter into smaller towns or into the sewerage sector; they also might not be willing to make investments due to the many uncertainties and risks involved in developing economies. Therefore, privatization does not necessarily enable countries that are short of capital to build new water systems (Anonymous, 1996).

Instead of limiting competition by enabling private operators to turn the service into a private monopoly, competition can be maintained and increased through outsourcing various noncore and support services. Under this model, the core operations of a water utility remain in public ownership and operation, but noncore operations are produced by private companies on a competitive bidding basis. Vertical competition should ensure higher efficiency than vertical integration (see Figures 3 and 4). Continuous competition for noncore services based on reasonably short contract periods is preferable to onetime competition for monopoly of entire services.

A Municipal Model Protects Public Interest Better Than an Overregulated Private Monopoly

Water supply and sanitation form a central technical service of communities. In Finland and many other European countries (Nordic countries, the Netherlands, Germany, etc.), this service is organized and often also provided by municipalities either through (a) the traditional municipal utility, (b) an autonomous utility, (c) a company owned by the municipality, or (d) a

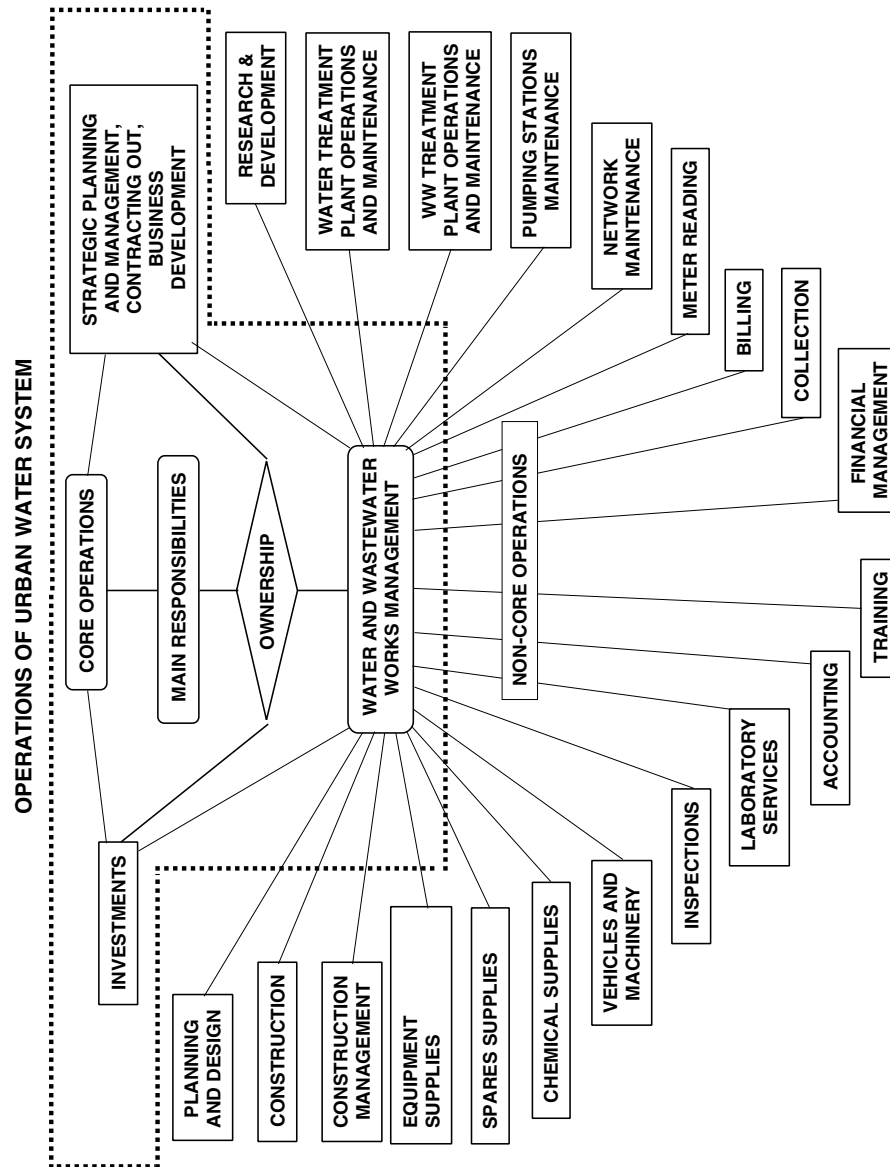


Figure 4: A Framework for Core and Noncore Operations of Water and Sewerage Utilities

SOURCE: Kraemer (1998), modified by authors.

NOTE: WW = waste water.

1. Water as a marketable private good.
2. Water as a public or collective good.
3. Water as a common property resource (differing from the public good characteristic in that it is subject to right of capture, becoming private on capture).
4. Externality characteristics of water (including the effects of water transactions on third parties).
5. Public utility characteristics of water (the fixed high costs, lower per unit costs of output characteristics of the water sector).
6. Option value of water (this relates to the foreclosure of future options, for example as a result of interbasin transfers which are often irreversible).

Figure 5: Six Fundamental Characteristics of Water Resources

SOURCE: Gray (1983, cited by Carruthers & Morrison, 1996).

The nature of water and sanitation service activity itself requires that the longer term be considered in decision making.

supramunicipal (intermunicipal or regional) utility. In sparsely populated areas of Finland, joint water service systems are implemented by private water cooperatives whose founding and operation are, nevertheless, in most cases, supported by municipalities.

In the selection of the mode(s) of water service implementation, one must consider the long-term experiences and the nature of the services. Ultimately, it is a conscious value judgment: What do decision makers consider most essential? The nature of water and sanitation service activity itself requires that the longer term be considered in decision making. Gray (1983, cited by Carruthers & Morrison, 1996) presented six fundamental characteristics of the water resource (see Figure 5) and stated that all of them (not just the first, “water as a marketable private good”) should be considered in the formulation of a water policy. The neoclassical approach does not consider medium- or long-term implications of water policy other than efficiency.

With regard to water and wastewater services in Finland, municipalities have been entrusted with the task of organizing and regulating the roles, liabilities, rights, tasks, and relations between themselves and private enterprises. This institutional framework (with all its decrees, provisions, and limitations) must be such that all parties benefit from the cooperation. The municipalities are in charge of the provision of water and sewerage services in accordance with legislation. The production of the services can be organized in principle within various public-private partnership models. In any case, the water and sewerage services are extensively controlled and regulated by legislation, rules, various authorities, and agreements between the water and sewerage utility and consumers—which severely limits autonomous decision making by the municipal administration.

Finnish citizens are at least theoretically able to control the exercise of power and influence it when ownership has been retained under the municipal administration. The municipal council or the board of directors should formulate the targets and monitor that targets are met. If not, the council or the board can introduce the required measures.

Most public water and sewerage utilities are managed well in Finland in terms of economy and quality of service. Because many of the public utilities are profitable, it is highly unlikely that the sale of assets could be realized. From the point of view of the citizens—the paramount owners who have paid for the assets—it would be strange if the right to profit would be transferred from them to the private sector. Although higher operational ethics could be demanded of enterprises, citizens should nevertheless not be left at the mercy of those enterprises. Ultimately, the responsibility for provision of water services lies with the public sector. The provision of water supply and sewerage has several social objectives: openness, universality, continuity, equal access, and equity. Public ownership and management of water utilities can ensure both operating efficiency and social responsibility.

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Public-Private Partnership Outperforms Privatization

In relation to public services such as water supply and sanitation, it is advisable to use the term *privatization* only in the case of full or material privatization—that is, when assets are sold to the private sector (Hukka & Katko, 1999). The term *public-private partnership* should be used when referring to arrangements such as BOT concession, leasing, management contracting, or service contracting. Although, in some cases, the concepts of formal, functional, and organizational privatization have been used in municipal administration (Rasinmäki, 1997), it is advisable to place these activities in the category of commercialization of service production.

A common perception of public-private partnerships is that a real partnership can be achieved only if the private and public sectors contribute equal financial inputs and risks. The authors' view is that public-private partnerships should be understood as a more diversified concept than just a private finance initiative.

Private sector participation in water and sanitation service production is definitely necessary and should be encouraged. However, privatization in the form of private ownership and management of water utilities may not be the overall solution. Both the private and public sector have played their own important roles in the development of water and sanitation services and will continue to do so in the future. The public sector has fundamental social and economic tasks and liabilities. A fundamental role for the public sector in safeguarding and providing for the economic and social welfare of the citizens is a condition of democratic government (Martin, 1994).

In public-private partnership, the role of the public sector includes maintaining a strong political commitment to the service as well as integrating environmental and other value considerations into the planning and decision-making process. Private companies may produce support services in their own core-competence areas—for instance, in planning and design, construction, supplies, or special services. The private sector may provide skills and management expertise to deliver public services more efficiently through introducing commercial operational principles. The private sector may also provide financing for utility investment needs. Public-private partnerships can promote efficiency and effectiveness.

Kingdom (1995) pointed out that deferred maintenance (assets stripping) is a short-term measure that can be done only because of the longevity of the water industry's assets. He suggested that to help facilitate public-private partnerships, there is a need to provide potential partners with reliable information. One way of providing information is infrastructure asset management through a comprehensive Asset Management Plan (AMP). An AMP provides a quantitative and independently auditable statement of all vital information in a rational framework that can be the basis of a public-private partnership contract. The key components of an AMP are (Kingdom, 1995) as follows:

- assessment of current condition and performance of assets,
- current operating costs,
- current financial position (including revenues, balance sheet, and cash flow), and
- required and anticipated future levels of service, and methods of measuring and monitoring performance of the partner.

The following experiences have been gained over the long-term from the development and implementation models of water supply and sanitation (Hukka & Katko, 1999):

1. Nearly all of today's Organization for Economic Cooperation and Development countries tried to establish water supply and sewerage systems run by private companies in the mid- and late 1800s. Yet municipalities acquired ownership of these facilities quite rapidly.
2. In Finland, municipalities have owned and operated the water supply and sewerage infrastructure in urban and rural centers since the 1880s. Waterworks have financed their

operations primarily through consumer fees, but sewage works have been financed through municipal taxes since the early 1970s.

3. In Finland, smaller waterworks have traditionally been consumer-owned and -managed water cooperatives. Although they are private enterprises, they aim at cost minimization instead of profit maximization, partly at the expense of service quality.
4. In France, privately managed waterworks were established in the mid-1800s. French private operators have also gradually captured markets around the world in other service sectors. These enterprises have won concessions of up to 30 years to run facilities. There is hardly any competition after the contract has been awarded, because external services needed by a utility are bought from a member of the same or an affiliated group. The competition for a new concession or lease (affermage) is not real because only the enterprise itself knows the facility well enough to be able to minimize risks. Moreover, the markets have in practice been divided to a large extent geographically between the three major companies.
5. The sale of regional water and sewage works' assets to the private sector in England and Wales in 1989 is a unique incident in the water sector. "Thatcherism" and legislation that curtailed the borrowing by earlier public water and sewage utilities lay behind that privatization drive. As a result, the English and Welsh regional governments have lost their relative importance in the administration of water services. On the other hand, the privatization of utilities has facilitated long-awaited additional investments (such as extension and rehabilitation of wastewater treatment facilities and networks).
6. The experiences from the privatization of the English and Welsh water and sewage works are hardly fit for welfare societies (in which the goal is to administer the services at the lowest possible level and to safeguard public interest, accountability, and transparency through democratic decision making).

In international discussion, public versus private service is too often seen as a black-and-white issue. Yet countries with the most comprehensive and the best operative water and sanitation services practice public-private partnerships. In a symbolic way, public-private partnership in Finnish water services can be described as a water tower (see Figure 6). Under normal conditions, the water level and filling ratio of a tower fluctuates between about 30% and 100%, and so does the share of services bought from the private sector. The stem of the tower represents the core competence of the municipality-owned utility. The tower is resting on a community of customers under the rule of a local government. Demand is satisfied by water service. Through the roof, the central government guides sector policies supported by regional administration.

In Finland, the role of the private sector as a service producer has been significant. Substantial outsourcing has been practiced. It is based on competitive bidding on support services. Appropriate public sector reforms through commercialization and public-private partnerships can provide as good results as heavier privatization programs such as the sale of assets as well as concession, lease, and management contracts. The increased efficiency that was achieved in the 1980s and 1990s in England and Wales through privatization could also have been achieved through public sector reform. In countries such as Finland in which municipalities are tantamount to the public sector as regards water and sewerage services, public sector reforms have particularly proven their strength in restructuring services production.

There are several alternatives for restructuring, starting from the basic role of the municipality as a service producer or provider:

1. Public sector (municipal department or government) as the service producer;
2. Public sector (municipality) does not produce services: (a) customer-oriented management models and (b) market-oriented management models.

A customer-oriented (user-oriented) public services management model (see Figure 7) draws its driving force from the information available in the customer market. An important part of customer information is pricing—the customers' willingness and ability to pay the full or

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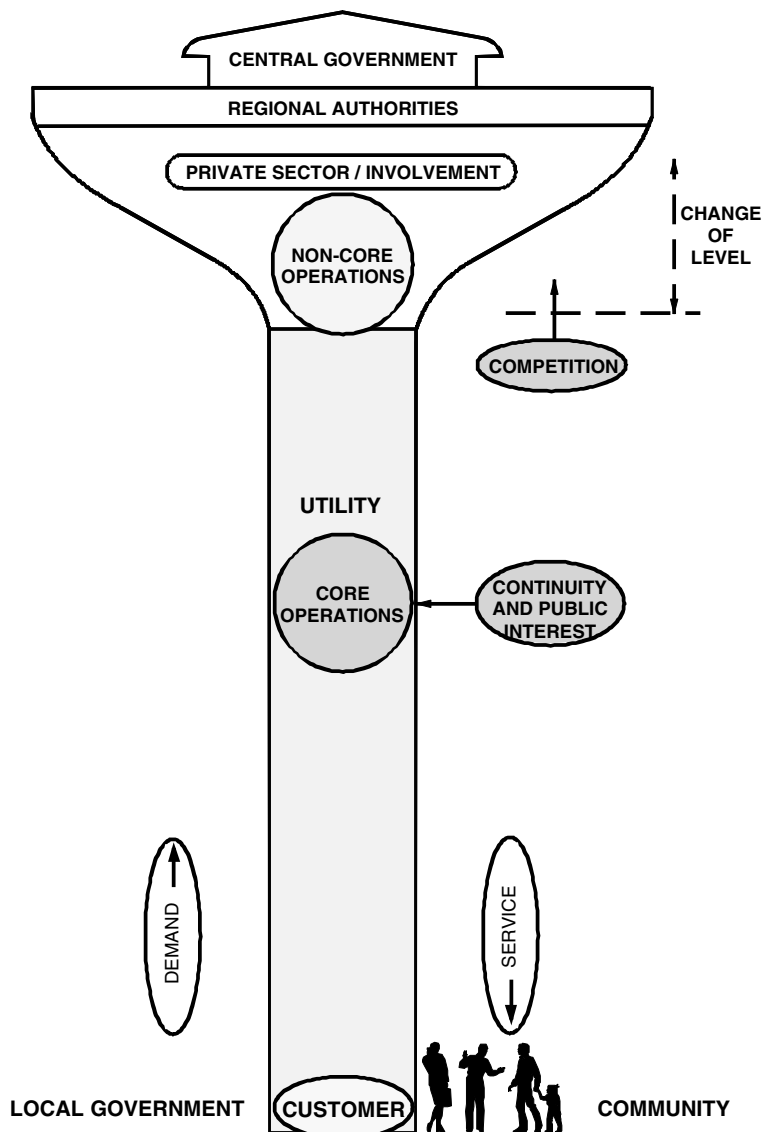


Figure 6: A Finnish Public-Private Partnership Model for Water and Sewerage Services
 SOURCE: Hukka and Katko (1999).

subsidized price of a service. A market-oriented management model depicts a situation where customers (based on their choices) and competitors (based on their actions) affect the control and management of the organization (company). In other words, the organization draws its driving force mainly from market success. Customer-oriented management models that directly link market and customer feedback to the management and control system are in many sectors only in their initial phase (Jääskeläinen, 1994).

Corporatization is another means of restructuring. In principle, corporatization is a step toward market orientation (market-oriented management). The change sends a message that the service has to consider the market situation and customer feedback (Jääskeläinen, 1994). Based on customer orientation, monitoring, and management tools as well as increased democratization and accountability, services can be produced through the public sector more efficiently than through privatization and deregulation (Whitfield, 1992, cited by Anttiroiko, 1994, p. 179). The responsive public service model introduced by Hadley and Young (1990) aims to make public

An important part of customer information is pricing—the customers' willingness and ability to pay the full or subsidized price of a service.

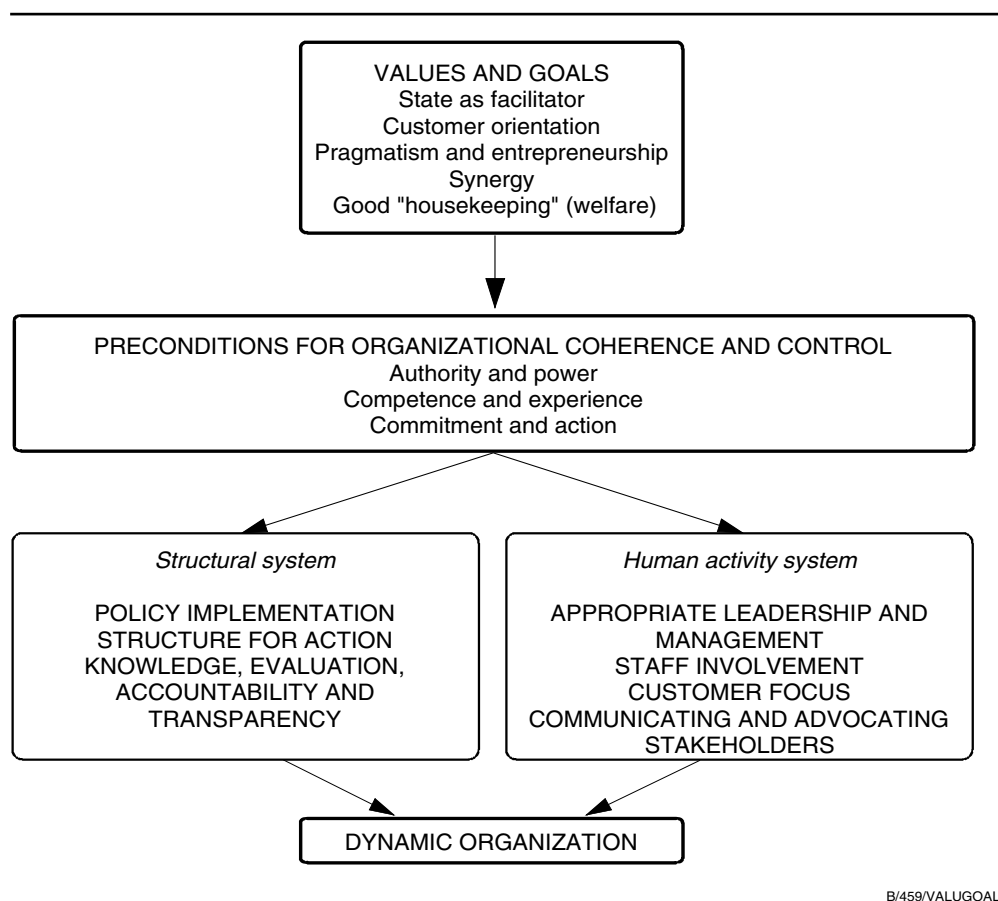


Figure 7: Key Elements of a Responsive Public Services Model
SOURCE: Hadley and Young (1990), modified by the authors.

service production both more efficient and a legitimate alternative for an ultraliberalistic private service production.

Discussion and Concluding Remarks

Private sector participation is becoming increasingly prevalent in water supply and sanitation services. But privatization in the form of private ownership and management of water utilities may not be the best solution. Public ownership is preferable in welfare societies, such as the Nordic countries where local democracy is strong through municipalities (local government). Public-private partnerships are established in several alternative modes that can provide efficient and effective water services management. The Finnish public-private partnership model has proven successful: Publicly owned municipal water utilities in Finland run the core operations, whereas the private sector provides various noncore support services. Inefficient public water utilities can be reformed through increased application of commercial principles and private sector procedures in the operation of utilities. In developing economies, the employment of private operators provides two major advantages: (a) They can train the personnel, because the lack of skilled personnel at all levels is immense, and (b) they provide the required best available technologies, best management practices, and best professional judgement.

In the selection of the mode(s) of water service implementation, one must consider the long-term experiences and the nature of the services. Ultimately, it is a conscious value judgment:

What do decision makers consider most central? Political bodies should avoid making irreversible major strategic decisions as happened in England and Wales. The nature of the water and sanitation service activity itself requires that long-term development should be considered in decision making. The key policy issue is whether the water utility is a for-profit production organization or a nonprofit service organization having social goals.

Ultimately, the responsibility for providing water services lies with the public sector. Efficient provision of these services requires novel approaches to public sector management and its relationship with society and citizens. The key consideration, however, is not whether the service is private or public but how well the utility is fulfilling its objectives. This is definitely achievable for the public organizations—with or without public-private partnerships.

Efficient provision of these services requires novel approaches to public sector management and its relationship with society and citizens.

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ARTICLE III

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Operational Paper

Appropriate pricing and cost recovery in water services

Osmo T. Seppälä and Tapio S. Katko

ABSTRACT

The viability of water services is still constrained by inadequate cost recovery, especially in developing economies. This paper reviews and analyses recent issues and international experiences from water pricing policies and practices. Full cost recovery (FCR) is becoming a recognised policy objective in industrial economies, although irrigation water tariffs are often subsidised. In developing economies water tariffs are generally below the economic cost of water, and tariffs are not adjusted regularly. Case studies from Kenya and Zanzibar illustrate the importance of an appropriate policy environment and institutional arrangements. The main factors contributing to poor economic performance of water utilities are highlighted. Water utilities in developing economies need more management autonomy.

Key words | cost recovery, financing, water pricing

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INTRODUCTION

Not more than a decade ago the policy of free water was still largely applied, especially in developing countries. Inadequate cost recovery was the most severe constraint in water supply. In the 1990s water policies gradually acknowledged cost recovery and appropriate water pricing as an element of service viability. The key elements of appropriate pricing are benefits and costs, predictability of consumer contributions, water tariffs, and fee collection and financial management. The low income of water utilities in developing and transition economies and their potential revenue base should lead to improved tariff setting and revenue collection. However, water tariffs have declined in many countries in real terms. Rural areas, in particular, have lacked appropriate institutions for developing cost recovery strategies.

Water was officially acknowledged as an economic good only in the early 1990s. The earlier view of water as a public and social good made it necessary to subsidise public water supply systems heavily. Even nowadays water prices and tariffs are universally below the full cost

of supply. Subsidies for specific groups, particularly people living in poverty, are required in some countries. However, viable water services require cost recovery based on the specific conditions of each country.

METHODS

The paper starts with an analysis of water infrastructure financing, pricing policies and practices related to financially viable operations of water utilities. International comparisons are mainly based on studies carried out recently by the OECD, the European Union and the World Bank.

Empirical findings are based on field data from two cases of Finnish development assistance: (1) Western Province, Kenya and (2) Zanzibar, Tanzania. The economic performance of selected community- and ministry-managed piped water supplies in Western

Province, Kenya was assessed in 1995–96 (Rämö *et al.* 1997; Hukka 1998) and later by the Kenya-Finland Community Water Supply Management Project (1997–2001). The first author carried out additional comparative analyses in the field in October–November 2000 (Seppälä 2000). The case study on Zanzibar is based on the first author's experiences and analysis of the economic and financial viability of the four urban water supplies (Zanzibar town and Wete, Chake Chake and Mkoani towns in Pemba) in 1993–96 (Seppälä 1996).

RESULTS AND DISCUSSION

Water infrastructure financing constraints

Inadequate financing is a major constraint on the development of new, and rehabilitation of existing, water infrastructure. Annual investments in water infrastructure, mainly in the developing countries, should be increased from USD 70–80 billion to about USD 180 billion to attain the service coverage targets up to 2025 (GWP 2000; Vision 21 2000). Just the financing needs of operation, maintenance and rehabilitation of the existing water infrastructure exceed the currently available resources.

For instance, Kenya is estimated to need a total of about USD 350 million over a 10-year period for water supply. The annual development and recurrent budget of the responsible sector ministry is about USD 17 million, which means that only about 50% of the required financial resources are available through the public sector budget (Seppälä 2000).

Although the lack of financial resources is a major constraint on the future development of the water supply and sanitation (WSS) sector, availability of financial resources alone will not solve the problem. Other major constraints that require serious attention are the following:

- Weak sector institutions and poor incentive environments.
- Inappropriate pricing policies that are not conducive to long-term sustainability.

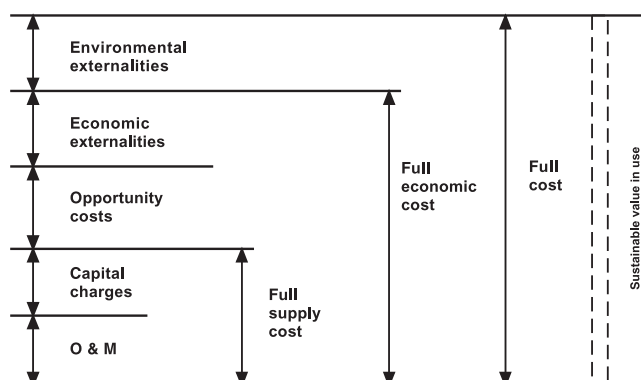


Figure 1 | Elements of the cost of water (modified from Rogers *et al.* 1998).

- Insufficient appreciation of the role of effective demand in the investment process.
- Difficulty in devising charging structures and mechanisms that are effective in generating resources but also protect the interests of the poor.
- Lack of suitable financial intermediaries to facilitate funding of large-scale investments.

Costs of water, pricing policies and tariff setting

Improved water allocation and conservation can be achieved by appropriate water pricing mechanisms. Thus, water pricing has become a very essential policy tool (Dinar & Subramanian 1997). In theory, a water pricing system where charges are equal to the marginal costs of providing the water services will allocate resources most efficiently. In practice, deviations from the marginal cost pricing principle are common. Water prices, effluent charges and incentives for pollution control should be determined according to the principle of *full cost of water* (Figure 1). Tariffs should match the costs of supply (i.e. capital and O&M costs), but also include opportunity costs, social costs, and economic and environmental externality costs (Bhatia *et al.* 1999; OECD 1999a). Water prices should be based on both *economic and environmental efficiency* and *broad (social) equity* goals (OECD 1999b).

The term *full cost recovery* (FCR) means that water charges recover all economic, environmental and resource

(opportunity) costs of the provision of household water services. The term *full financial cost recovery* (FFCR) is used when only financial costs are recovered. It is difficult to evaluate environmental costs on a monetary basis. OECD (1999a, pp. 163–164) presents definitions of the factors of FCR price taxonomy and cost and revenue classification for FCR measurement in different cost-recovery scenarios. Many OECD countries have already adopted FCR as an operating principle, but very few countries actually base their household water pricing systems on the FCR principle.

In estimating the value of water, societal objectives of poverty alleviation and food security must be considered. Pricing mechanisms are an effective control and management tool and can substantially affect the market and demand for services. Customers' interests must be taken into account in water pricing policy. Customer-based approaches are essential in (i) contributing to water policies, (ii) facilitating successful implementation, and (iii) making the policies socially and politically acceptable (EU 2000a). Development of sustainable water charges requires public involvement, which will make citizen sounding boards or other participation more common in future. Water charges will become more closely linked to demand-side management programmes (Chesnutt 2000).

In addition to *transformation (production) costs* of water, *transaction costs* related to the provision and production of water services should be included in the economic externalities of the cost of water. Transaction costs affect the cost and pricing of water services significantly, especially in cases where service production is delegated to a private service provider (Seppälä *et al.* 2001).

Irrigation water tariffs have often been heavily subsidised at the cost of other water users. Since irrigated farming is perceived as a means of promoting social and economic development objectives, water prices are often set according to the profitability of each irrigated crop, rather than the actual costs of providing the water for irrigation purposes. According to OECD (1999a), several countries already apply FCR principles to their irrigation infrastructure. This is important since about 70% of global water use goes to irrigation.

The importance of appropriate pricing of water and cost recovery is nowadays widely recognised also in developing countries. There are several approaches and methodologies for water tariff setting to ensure appropriate cost recovery. The most common elements of the tariff structure include: (1) a connection charge, (2) a fixed (recurring) charge, and (3) a volumetric charge based on consumption.

Allocation of costs and revenues remains essential in tariff design, because it addresses the issue of what costs should be paid by which customers. Cost allocation becomes more intentional, requiring analysis of who causes various service costs and how. Tariffs should cover historical costs while reflecting future cost consequences. Pricing that embeds real and avoidable costs will become common (Chesnutt 2000).

Metering, billing and revenue collection

An efficacious water-pricing scheme, installation of meters, and provision of proper regulatory and economic incentives to users are important for proper water services management. Yet, real success and viability depend on proper enforcement of charges and monitoring of users, as pointed out by Bhatia *et al.* (1999). Appropriate and effective billing and revenue collection are equally important for cost recovery.

Metering makes it possible to apply marginal cost pricing. The decision to apply metering is based on perceptions about the optimal pricing structure. This depends on balancing the economic, environmental, and social criteria (OECD 1999b). The costs are usually the main argument for not installing meters in developing countries. Modern water meters are sensitive to water impurities, which causes O&M problems. Metering is often regarded as conflicting with social equity goals. A balance should be found between economic efficiency, environmental aspects and equity objectives. The application of household water metering continually increases, especially in industrialised countries but also in transition and developing economies. Yet, household metering should be applied where it is feasible, not as an obligatory measure.

Public water utilities in developing countries have been inefficient in water metering and revenue management. The private sector has increased its involvement through metering, billing and revenue collection contracts. With appropriate price regulation, this could be a feasible alternative for many utilities. Billing and revenue collection have been problematic especially in rural areas.

International comparisons

Water pricing policies and practices vary significantly. Mere comparison of water prices per cubic metre is misleading due to the share of fixed costs and different levels of consumption. Comparisons should rather be based on annual per-capita or per-household bills (Kraemer & Piotrowski 1998). Despite the difficulties, a general comparison is made here in three main categories: (1) industrial economies (IEs); (2) transition economies (TEs); and (3) developing economies (DEs). Various recent studies have compared water prices and documented water pricing reforms (Dinar & Subramanian 1997, 1998; Kraemer & Piotrowski 1998; OECD 1999*a,b*; Dinar 2000; EU 2000*a,b*; BIPE 2001). Countries and utilities have different reasons for charging for water, including cost recovery, redistribution of income, improvement of water allocation, and water conservation. The most common configuration for pricing combines a fixed basic charge and a variable tariff component based on volumetric consumption. The share of fixed charges should not exceed 30% of the total, otherwise the benefits of metering control will be lost. Fixed charges vary greatly, reflecting countries' different objectives in charging for water. Volumetric charges for urban and agricultural water use are relatively similar in most countries.

Industrial economies (IEs)

Public water supply pricing structures, for instance in the EU, cover a range from conservation-oriented increasing block tariffs (Italy, Spain, Portugal, Greece) to predominantly flat-rate systems (most of the UK). In Ireland, there is no domestic water price, and domestic water services are directly financed through the general taxation

budget (EU 2000*b*). Many IEs nowadays combine fixed basic charges and volumetric pricing components. In volumetric charging, the trend is from decreasing block tariffs to increasing block tariffs (OECD 1999*a*). In privatised water utilities, and utilities where water services—or at least billing and revenue collection—have been arranged through private providers, tariffs seem to have increased relatively faster than the real cost of producing water.

In many IEs water and wastewater charges reflect well the full cost of water; they even generate some excessive net profit for the utility (OECD 1999*b*). In Finland most large urban water utilities adopted a water-pricing system during the last decade that made the earlier used 'hidden taxation' more visible. Although these municipal utilities originally aimed at reasonable cost recovery, nowadays many of them earn excessive profits for the owner organisations. Tariffs are not always based on full cost recovery but on the need to subsidise other public sector activities or to finance activities of the municipal central administration. However, newly enacted legislation in Finland (2001) aims at keeping the public utility profits reasonable. In any case, the profits of the private service providers would be higher.

Transition economies (TEs)

Water pricing policies in transition economies (TEs) rarely integrate economic and environmental efficiency objectives. Tariff levels are often too low to give a clear signal to users. In the Eastern European transition countries cost recovery has been poor, but several countries have adjusted tariffs during the last few years. Water pricing plays a key role in future water policies of the countries that are looking for accession to the EU.

Especially in transition economies, increasing block tariffs are applied for environmental reasons. Although they aim at economising water consumption for economic reasons, they also have a social component. Increasing block tariffs are also called conservation tariffs or social tariffs. The economic advantages of supplying larger quantities of drinking water are limited or even absent. Decreasing block tariffs should therefore be avoided (Achttnienribbe 1997).

Developing economies (DEs)

Application of sound economic and environmental principles to water pricing is difficult due to affordability and social concerns. Central government owned and managed water utilities are not able to revise tariffs to reflect cost escalation. This is mainly a political issue and only to a lesser degree caused by inadequate ability and willingness of the customers to pay for increased tariffs. In developing economies the poor are typically not connected to the water system, and they pay much higher prices for water from private vendors and resellers.

Ever since their independence, many DEs have experienced a strong decline in water tariffs in real terms. In Mozambique, which gained independence in 1975, water tariffs were not adjusted until 1985. A dramatic decline in real water tariffs was experienced in Kenya and Tanzania (Katko 1991). Table 1 gives a comparison of water prices in selected countries.

Case study 1: Western Kenya water supplies

The Western Province of Kenya has a population of about 3.4 million (the country's total population is about 30 million). The Finnish Government has assisted in the development of water services in the Western Province since the early 1980s. More than 3,100 point-source water supplies and about 20 community-managed piped water supplies have been constructed, and about 40 piped water systems rehabilitated. There are a total of about 80 piped water systems in the Western Province serving about 1.5 million people. Urban water supply coverage is about 60–70% and rural coverage 40–50%. According to the new water policy, the Kenyan government aims at handing over the management of piped water supplies to communities in rural areas and to municipalities in urban areas.

Community water supplies can, in principle, set their own water tariffs, but they have to be approved by the water ministry. In practice, community water supplies apply similar tariffs as government systems. Since 1971 Kenyan water tariffs for public water systems have been adjusted only six or seven times. Water tariffs in Kenya have undergone a number of structural changes. The tariffs include different components such as a minimum

charge, a non-volume based monthly (basic) charge or monthly meter rental charge, and a consumption charge. Figure 2 shows the development of water tariffs in Kenya over the long term, including recent tariffs from the Western Province. Adjusted to 2000 price levels, the tariffs have declined almost continuously until the late 1990s.

Table 2 shows some basic indicators for three selected ministry water supplies based on data collected in 2000 (Seppälä 2000). Revenue collection efficiency was low (21–66%). Collected revenue covered only 8–37% of the annual operating expenditure of the three selected ministry schemes (Table 2). In Busia district, the ministry-managed piped water supplies (10) were able to cover only 20–34% of their annual expenditure with the collected revenue. Revenue collection efficiency was 73–78% (collection of the billed revenue). (Seppälä 2000).

Although the cost and financial data of both community- and ministry-managed water systems are fairly unreliable, the following main findings were made based on the studies carried out (Rämö *et al.* 1997; Hukka 1998; Seppälä 2000):

- The economic and financial performance of both community- and ministry-managed systems is poor. The economic performance of the ministry schemes is even worse than that of community schemes. There were no improvements in the situation between the studies done in 1995, 1998 and 2000.
- Billing and revenue collection was poor. In community systems 70–90% of potential revenue was billed and 60–80% of billed revenue collected. In ministry systems only 20–40% of potential revenue was billed and 70–90% of billed revenue was collected.
- Total revenue per unit should be 2–50-fold to break even. The average potential revenue could cover operating expenditure and nearly all capital costs of the ministry schemes, but the main problem is inefficient billing and revenue collection.
- Only a few of the community systems ($n = 32$) could cover their operation and maintenance costs with collected revenue. In the case of ministry systems ($n = 43$), collected revenue covered only 5–70% of operating costs.

Table 1 | Comparison of water prices in selected countries (modified from Dinar & Subramanian 1997, 1998; Kraemer & Piotrowski 1998; OECD 1999b; Dinar 2000; EU 2000b; BIPE 2001)

Country	Source	Year	Drinking water prices EUR/m ³		Average annual water bill EUR/year	
			Range	Average	Per household	Per capita
Belgium	5,7	1999		1.80		
	9	1999		1.14		
	6	1997	2.31–2.77			
Denmark	4	1993	0.13–0.84	0.41	n.a.	28.12
	6	1997		3.57		
England/Wales	4	1995	0.51–1.43	1.48	138.05	58.80
	9	1999		1.11		
	2	1995			160.14	
Finland		2000		0.76	252.30	
	6	1997		3.10		
France	4	1994	0.06–1.86	1.02	132.94	53.69
	9	1999		1.14		
	2,3,6	1997	0.40–2.90			
Germany	4	1996	0.92–2.02	1.46	130.38	71.58
	9	1999		1.75		
	2,3,6	1997		1.90		
Italy	4	1992	0.10–0.67	0.36	112.48	38.35
	9	1999		0.70		
	2,3,6	1996	0.16–0.92			
	7	1999		0.43		
The Netherlands	4	1995	0.41–1.30	1.38	173.84	69.02
	9	1999		1.14		
	6	1997		3.55		
Spain	4	1992	0.01–1.28	0.20	n.a.	n.a.
	9	1999		0.49		

Table 1 | Continued

Country	Source	Year	Drinking water prices EUR/m ³		Average annual water bill EUR/year	
			Range	Average	Per household	Per capita
Estonia (Tallinn)	7	1997		0.13		
Kenya	8	2000	0.18–0.36			
Zanzibar	1	1995	0.09–0.18			
Tanzania	2,3	1996	0.07–0.27			

1, Seppälä (1996)
2, Dinar & Subramanian (1997).
3, Dinar & Subramanian (1998).
4, Kraemer & Piotrowski (1998).
5, OECD (1999b).
6, Dinar (2000).
7, EU (2000b).
8, Seppälä (2000).
9, BIPE (2001).

- Low tariffs were the main reason for inadequate revenue. On average, capital costs accounted for 45–60% of operating costs.

Inadequacies in billing and revenue collection, especially with ministry systems, are related more to inefficient billing, meter reading and accounting management than poor collection itself (Rämö *et al.* 1997). In the case of government systems, the collected revenue goes to the Ministry of Finance and only partly returns to the utilities, which discourages billing and revenue collection.

Revenue from the operation of schemes should cover fully at least recurrent costs (O&M costs) of both ministry and community schemes. Revenue records of the community schemes are not adequate for estimating the total revenue collected by them. The potential total revenue for the Western Province could be about KES 49 million per year, implying that revenue could realistically cover O&M costs (Seppälä 2000). Yet, because the ministry-managed and other public schemes keep only a part of the revenue they collect, it has been impossible for them to cover their O&M expenditure with available revenue.

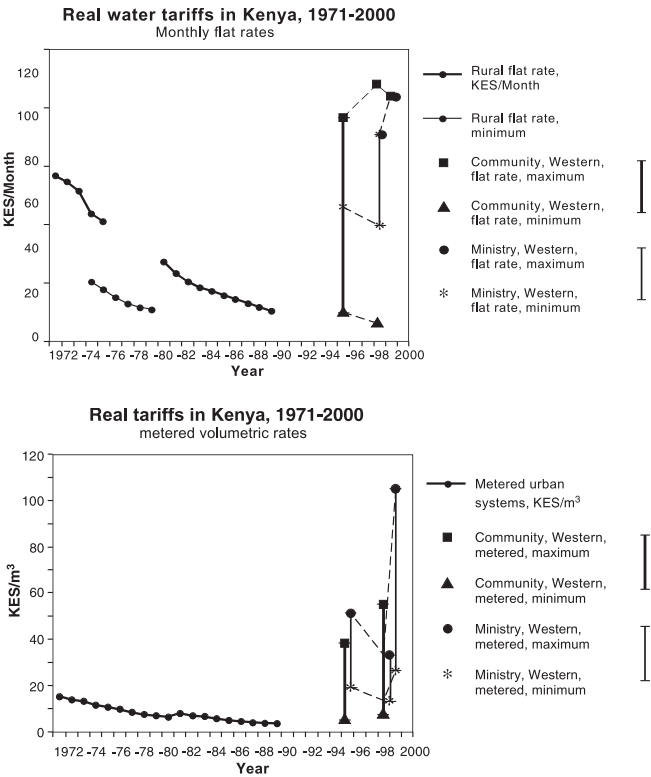


Figure 2 | Real water tariffs in Kenya 1971–2000 (modified and updated from Hukka *et al.* 1992). (a) Monthly flat rates; price level 2000. (b) Metered volumetric rates; price level 2000.

Table 2 | Basic indicators for three selected ministry water supplies in Western Kenya (Seppälä 2000)

Parameter/indicator	Name of water supply		
	Kibichori-Bokoli	Little Nzoia	Sosiani
Population served	16,200	n.a.	20,000
Annual O&M costs (KES/a)	1,076,640	1,218,000	1,308,900
Annual water production (m ³ /a)	520,800	1,164,000	151,400
Annual water sales (m ³ /a)	494,400	1,090,100	150,300
Water tariff (1997–98):			
KES/m ³	n.a.	12–15	n.a.
KES/month	90	90	90
Expected/billed revenue (KES/a)	420,000	2,079,300	480,000
Collected revenue (KES/a)	91,800	445,560	318,400
Revenue collection efficiency (%)	21.9	21.4	66.3
Collected revenue as percentage of annual O&M costs	8.5	36.6	24.3

Case study 2: Zanzibar urban water supplies

Zanzibar urban water supplies cover Zanzibar town on Unguja Island and Wete, Chake Chake and Mkoani towns on Pemba Island. The estimated populations of these towns in 1996 were: Zanzibar 224,000, Wete 24,000, Chake Chake 20,000 and Mkoani 9,000. The projected population growth in the urban areas is about 3.8% annually.

Zanzibar water supplies started to experience severe financial and viability problems due to economic difficulties in the 1970s and 1980s, and urban population growth. Urban water supply started to deteriorate after the government declared free water for domestic customers in 1981. Domestic customers that previously paid for water were then exempt, and only commercial and industrial customers had to pay for water. Government institutions were also exempt from payment. The revenue base of commercial and industrial customers was too narrow for adequate cost recovery, especially on Pemba.

Over 90% of the revenue came from Zanzibar town and less than 10% from Pemba. The annual water revenue in 1991–1995 from industrial and commercial customers in Zanzibar town was about TZS 6 million (EUR 7,200). It covered only 2–3% of the operation and maintenance costs.

During Finnish assistance (1990–96), the majority of the O&M costs were covered by donor funds. After 1996 O&M activities were largely neglected due to unavailability of funding. This led to a vicious circle of reduced revenue due to customers' unwillingness to pay for their water because of poor and intermittent service. Thus, in Zanzibar the core problem was related to water policy development. Water policy and services have always been an extremely political issue. In 1996 the government decided to increase tariffs for commercial and industrial customers, but to continue supplying domestic customers free of charge. As a consequence, the Finnish project was discontinued in 1996.

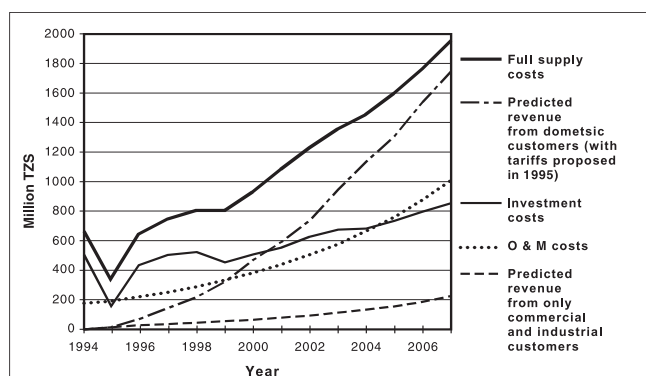


Figure 3 | Predicted trends of Zanzibar town water supply costs and potential revenue in 1994–2007 (modified from Seppälä 1996).

The real (marginal) costs of water were calculated in 1995 (Seppälä 1996). A revision of industrial and commercial tariffs and initial tariffs for domestic customers was proposed. The revised tariffs were not approved, but higher tariffs were applied to new customers such as tourist hotels. The proposed domestic water tariff based on full economic cost pricing was 200 TZS/m³ (EUR 0.24/m³). Yet by early 2001 no domestic charges had been levied.

Figure 3 shows the hypothetical trend of annual costs and revenues in Zanzibar town. Cost figures are based on the investment and operation and maintenance expenditures required to ensure adequate service. Hypothetical revenue figures are based on (i) predicted commercial and industrial user charges, and (ii) potential domestic customer revenue according to the project's recommendations. The figure shows how O&M costs could have been recovered based on the proposed domestic tariffs by the year 1999, if the required policy decisions and proposed improvements in revenue collection had been implemented. Full financial cost recovery (of O&M and investment costs) could have been achieved by 2007.

The majority of domestic customers, even in low-income categories, indicated a willingness and ability to pay, provided that the water service would be operational. Expectations for water policy and pricing reforms became optimistic again before the most recent elections in 2000. The high hopes were supported by Williamson's

crisis hypothesis and *honeymoon hypothesis* on auspicious timing of policy reforms (Dinar 2000). Unfortunately, the elections further increased political tension, and water policy reforms have to wait for another auspicious time.

Even if pricing reforms were to be implemented in the case of Zanzibar urban water supplies, substantial cross-subsidies would be required from (i) urban to rural water supply and (ii) from Unguja to Pemba, to cover at least the operation and maintenance costs. Zanzibar water supply cannot reach self-sufficiency without institutional restructuring that merges urban and rural water supply. A merged water authority in Zanzibar (urban and rural) would then be seen partly as a social measure to finance rural water supply. Cross-subsidies would increase urban water tariffs above the proposed domestic water tariffs. Yet these would be reasonable compared to the average income level. The minimum sufficient tariff level (about EUR 0.24/m³) would, however, cover no more than the full economic cost of water.

Lessons from the case studies

Although the customers' ability to pay is considerably lower in Kenya and Zanzibar than in industrial economies, water charges could be substantially increased. Charges should initially reflect the actual full supply cost of water, gradually also the full economic cost and finally the full cost of water. In the long run, customer charges are the only sustainable way of covering the costs of water system operations. Contrary to earlier beliefs, higher water charges in developing economies can improve equity. An increase in service efficiency as a consequence of raising the prices to those customers that are currently served could lead to an increase in water availability to the currently non-served population. Any reform that raises water charges, improves cost recovery, and generates funds for expanding and improving existing water systems, will be socially equitable even if charges to served customers are raised. In developing economies, the poor and non-connected people served by vendors pay a much higher price for water than those connected.

Table 3 | Water tariffs and water charges as a proportion of monthly household income in various countries (aggregate affordability)

Parameter	Unit	Zanzibar	Kenya	Finland	OECD average
A. Current average water tariff (excluding wastewater charges)	EUR/m ³	0.09–0.18	0.18–0.36	0.76	0.97
		70–150 TZS	15–30 KES		
B. Hypothetical average water tariff to cover Full Economic Cost of water (FEC)	EUR/m ³	0.44	0.54	0.72	1.17
C. Water bill as an estimated proportion of monthly income					
(a) With current tariffs	%	1.2–2.5	1.3–2.7	0.8	0.7
(b) With hypothetical FEC-tariffs	%	3.6–8.0	3.5–7.0	0.8	1.6

Table 3 summarises water tariffs and affordability in the case study countries and some reference countries. The data from OECD countries is based on *aggregate affordability*, which relates the average water charges to either average household income or to average household aggregate expenditure (OECD 1999a).

Affordability problems are likely to increase as countries move towards full cost recovery. In the EU countries, the present expenditure on water services is 0.3–1.2% of household income (EU 2000b). With full cost recovery, this would increase to 1–3% of household income. Affordability is a major issue in transition and developing economies. In developing countries, the poorest may spend as much as 50% of their income on water. Some institutions recommend that households should not have to spend more than 4% (threshold value) of their income on water services (EU 2000b). Yet this is rather controversial and such threshold values should not be applied categorically.

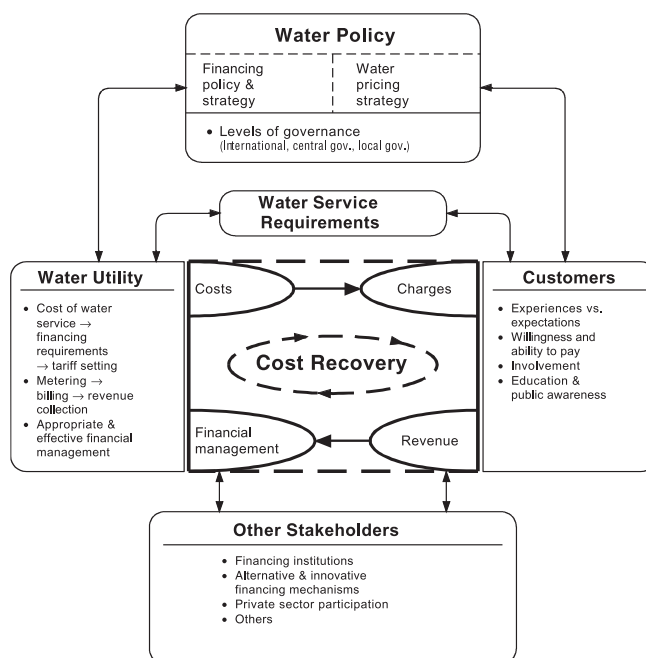
Key elements of sustainable financing and cost recovery in water services

Brikke & Rojas (2002) have divided the key factors contributing to cost recovery in the context of community-managed water supply systems into seven main categories:

1. Setting a strategy
2. Improving willingness to pay
3. Optimising costs

4. Establishing clear financial responsibilities
5. Setting an appropriate tariff
6. Improving access to alternative finance
7. Organising effective financial management

Based on the findings of this paper and Katko (1991), Figure 4 illustrates the key elements of sustainable

**Figure 4** | Key elements of sustainable financing and cost recovery cycle in water services.

financing and cost recovery in water services. Adequate cost recovery can only be achieved through stakeholders' clear understanding of their roles and responsibilities. Otherwise, enforcement and implementation will not succeed even if policies and strategies are appropriate in principle.

CONCLUSIONS

A prerequisite for viable water and sanitation services is that all costs arising from the service must be covered, either by water users or by the general public revenue or the public budget. Water pricing is an effective policy and management tool. Full cost recovery (FCR) should be a key policy objective whenever water infrastructure investments are made. In most industrial economies water charges, on average, cover the full cost of water, but often part of the water revenue is used to subsidise other sectors. If FCR is not applied in practice, any subsidies should be transparent, whether they come from general public revenue, or indirectly as cross-subsidies from other user categories. Irrigation water tariffs have been generally subsidised, but they are increasingly based on full supply cost or FCR. In developing economies water tariffs are generally below the financial cost of water, and wastewater charges are often not applied. Examples from Kenya and Zanzibar indicate that inappropriate pricing policies and inefficient financial management lead to poor financial performance and deteriorating water services.

Tariff structures have improved in most countries. The tendency is from decreasing-block and flat rate pricing structures to volumetric and increasing-block tariffs. Several innovative social tariff structures have been introduced. In the future, sustainable demand-based strategies should be applied to complement water pricing based on full cost recovery.

Appropriate pricing is necessary, but proper enforcement of tariffs and effective billing and revenue collection are equally important for economic performance. The supply cost of water does not vary significantly in different countries, but tariff structures and policies do. In developing and transition economies water tariffs have often declined in real terms. Tariffs are often set on a political basis, not on an economic one. Water utilities need more autonomy in

tariff setting and financial management. Higher water charges in developing countries can improve equity.

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IV

ARTICLE IV

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Customer-responsive water and sanitation services.
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CUSTOMER-RESPONSIVE WATER AND SANITATION SERVICES

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ABSTRACT

In recent years water services and utilities in industrialized countries have changed from supply-oriented to demand- and customer-oriented. In Finland most water utilities are owned and operated by municipalities. They used to be supply-driven, but currently larger municipal utilities and especially smaller water cooperatives are more customer-oriented. A study on four Finnish utilities showed that customers expect more information on their services and utilities. Yet, involvement of customers in utility operations and decision making is little in Finland. Changing operational environment of water services will present new challenges to customer involvement. Small, customer-managed water systems give more attention to customer involvement, which leads to better customer satisfaction and service quality. Customers' interests may easily be forgotten when private ownership and operation of water utilities is strongly promoted worldwide. In the future, provision of water services is more based on the ethics, values, rights, responsibilities and expectations of all relevant stakeholders. The next development phase from customer-orientation has to be real customer-responsiveness, which better recognizes the fundamental values and expectations of customers and other stakeholders.

Key words: water services, service quality, customer-orientation, customer-responsiveness

Water services and water utilities have traditionally focused on supply-driven production but recently they have become more interested in demand- and customer-oriented services in that order. Nowadays it is recognized that a satisfied customer is an essential stakeholder of a good-quality water service (Eriksson & Mellström, 1998). The focus of the water utility must be on the customer, his/her interests and needs. According to Lobato de Faria and Alegre (1996), consumers include not only direct users of the drinking water system, but also its indirect users, those who do not have a direct connection but who may be affected by the system. The two types of users, direct and indirect, are usually of the reactive type. The third type includes proactive users. These are individuals or organizations that make demands also with respect to important aspects beyond immediate perception (Figure 1). Examples of such users are environmental organizations, consumer protection agencies, and pressure groups.

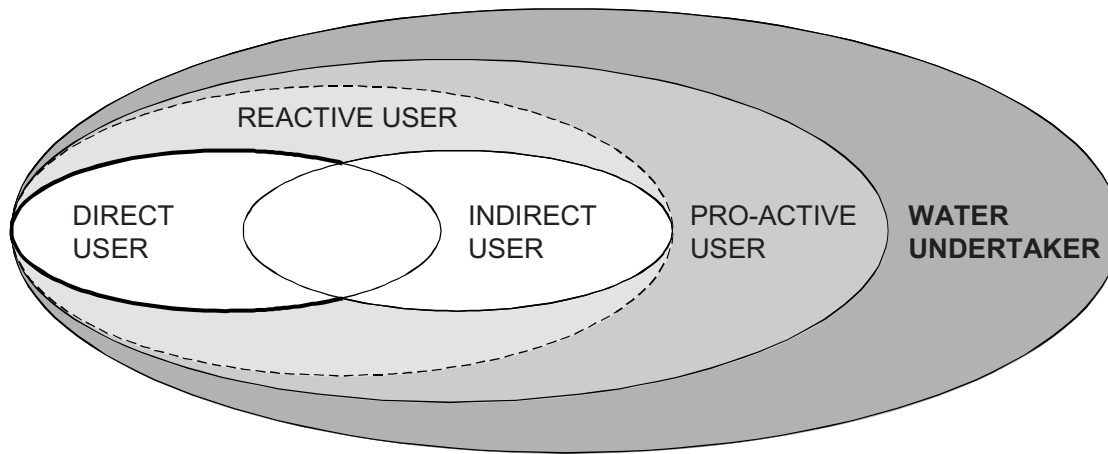


Figure 1. *User types and their ability to perceive the quality of service (modified from Lobato de Faria & Alegre, 1996).*

Stakeholders. According to Alegre et al (2000) the most important entities or stakeholders in water services are:

- *Water utilities:* public, private or combined organizations that manage the water supply systems
- *Consumers or direct users,* with whom a water utility has a supplier-customer relationship
- *Indirect stakeholders* who do not have a direct connection to the system but may be affected by it or its impacts on the surrounding environment (e.g. the consequences of water mains bursts, the quantitative or qualitative impact of water abstraction, etc.)
- *Proactive stakeholders,* such as environmental organizations, consumer protection agencies and other pressure groups
- *Policy-making bodies:* political establishments at local, regional, national and international level
- *Regulatory agencies,* responsible for setting up and verifying compliance with statutory and other obligations
- *Financing agencies,* of particular importance in such a capital-intensive sector as the water industry
- *Owners* of the water utility.

Figure 2 summarizes the various stakeholders and their essential roles in water service provision. Irrespective of their nature (private, public or mixed) or geographical location, all water utilities share a common purpose and management objectives, which may be stated as: “The achievement of the highest level of consumer satisfaction and service quality in line with the prevailing regulatory framework, whilst making best use of available resources” (Alegre et al, 2000).

A prerequisite for sustainable water services is that the organizations managing water services have the capacity to carry out their task. Water utilities must ensure that they have adequate water resources also in the future, and that they can provide adequate quantity and quality of drinking water to their customers. Consequently, utilities can carry out these functions only if they have appropriate financial base to expand and maintain the infrastructure, to attract required professionals, and to be proactive regarding the changing operational environment and future. A sound financial base requires a clear agreement between the utility and customers with respect to the level of service supplied and the true demand for it – a true ‘effective’ demand implying that people who are capable to pay for it are also willing to do so. Thus, a viable water system must also meet customers’ needs and expectations in a consistent manner. Customers’ role in the water service chain has to be strengthened and better recognized than earlier.

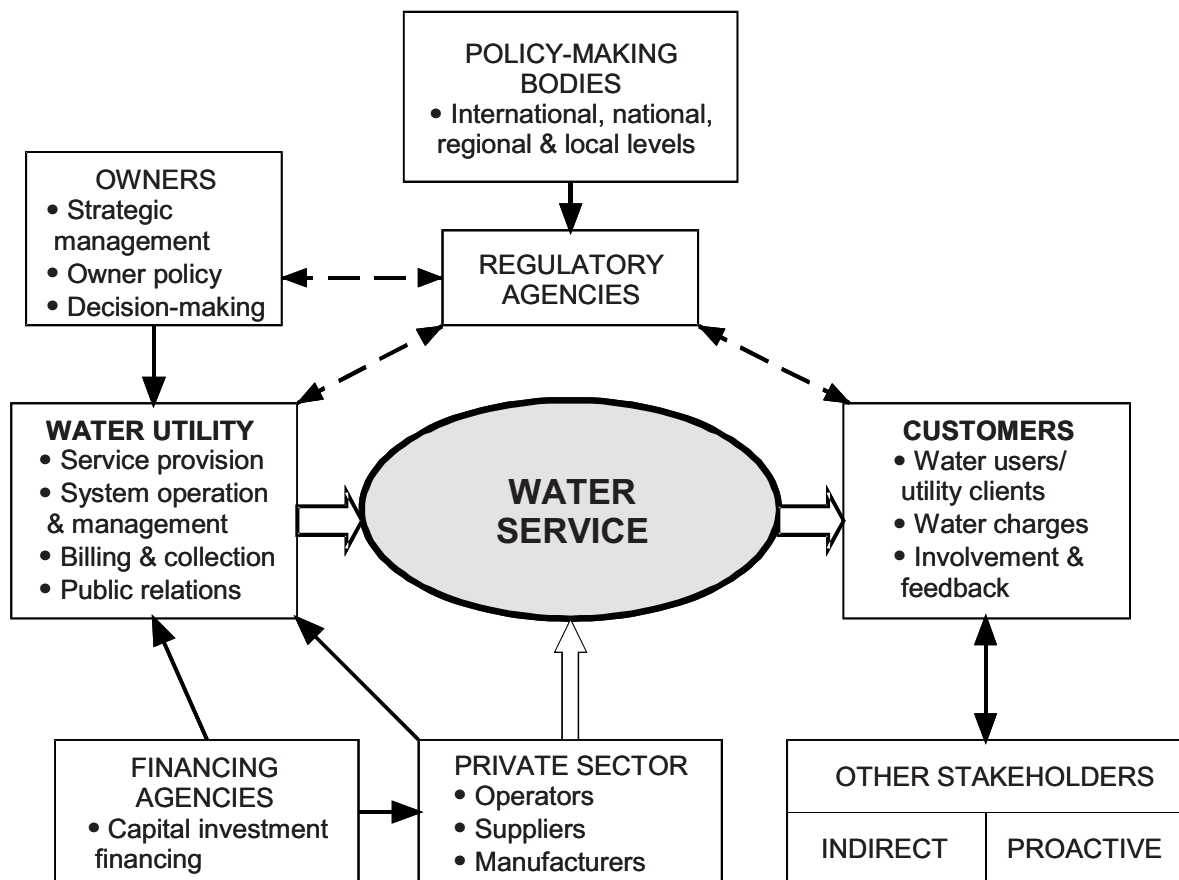


Figure 2. Stakeholders and their key roles in water service provision.

Change from beneficiaries to customers. Past policies and strategies concerning provision of water supply and sanitation services especially in developing economies ignored the various types of users to a large extent. Over time, the *community participation* concept emerged, which later evolved into *community management*. Yet, the overall concept and importance of customers as individual users has not yet fully been taken into account in the current water policies and development strategies. Regardless of which management option for water service provision is selected, the water supply organization should be customer-driven. Customers may play various roles as water rate payers, contributors, beneficiaries, and, particularly in rural areas, as owners, operators and caretakers. 'Customer' is a more appropriate term than the formerly used 'consumer', since it places emphasis on the value of water user, helping to promote a service culture within the organization. Especially in developing countries the customers' perception of ownership and responsibility has become a limiting factor. The extent to which people (customers) perceive ownership and responsibility for their water and sanitation services affects greatly their willingness to pay. This perception depends on several interlinked factors in addition to the formal ownership of the systems, which is currently favored by the water policies in many developing countries.

Service quality parameters. The need to understand the importance of customers' role and assessment of levels-of-service is twofold: (1) to promote improvement of the quality of the service delivered (rehabilitation and extension of existing systems), (2) to technically regulate the activities of management contracting of water utilities. The levels-of-service for water supply systems measure the degree of satisfaction of the customer concerning the quality of service delivered by the utility. The levels-of-service culture is based on the right of the customer to have an active role in decision making and inquire about the quality of the service.

It is important that water utilities concentrate on the most essential service quality parameters (and those most appreciated by the customers). A water utility can improve its economic performance by increasing its revenue through higher willingness-to-pay and operational efficiency by 'doing the right things first' from the customers' point of view. This applies especially to water utilities in developing countries, which suffer from the vicious circle of inadequate financial resources and revenue base to improve infrastructure and services and low willingness-to-pay due to unsatisfactory service quality.

It is obvious that even in the poorest urban communities user charges for water services are the most important and sustainable source of financing. The success in implementing user charges and revenue collection depends heavily on the commitment of the customers, which can be measured by their hypothetical and demonstrated willingness to pay for the services. The customers' commitment and their demonstrated willingness to pay depend mainly on their satisfaction with the service, which again depends on certain service quality parameters (quality, pressure, reliability, reasonable waiting time, etc.).

Typical factors that influence willingness-to-pay are: (i) benefits to the consumer, real and as perceived, (ii) relative monetary and non-monetary cost, (iii) opportunity cost, (iv) reliability of tap water supply and its alternatives, real and as perceived, and (v) water quality of the tap water supply and its alternatives, real and as perceived. By knowing which parameters of the customers mainly appreciate, it will be easier to devise strategies to improve customer satisfaction, their willingness to pay and finally the sustainability of the water utility operations.

A Task Force of the International Water Association (IWA) has proposed and developed performance indicators for water utilities (Alegre et al, 2000). The proposed indicators include ‘quality of service indicators’ divided into the main categories shown in Figure 3.

SUPPLY COVERAGE	SUPPLY RELIABILITY	WATER QUALITY	CONNECTION EFFICIENCY	CUSTOMER COMPLAINTS
Households and businesses supply coverage (QS1)	Pressure of supply adequacy (QS9)	Quality of supplied water (QS15)	New connection efficiency (QS20)	Service complaints (QS22)
Buildings supply coverage (QS2)	Continuity of supply (QS10)	Aesthetic quality (QS16)	Connection repair efficiency (QS21)	Pressure complaints (QS23)
Population coverage (QS3)	Water interruptions (QS11)	Microbiological quality (QS17)		Continuity complaints (QS24)
Coverage with service connections (QS4)	Interruptions per connection (QS12)	Physical-chemical quality (QS18)		Water quality complaints (QS25)
Coverage with public taps or standpipes (QS5)	Population experiencing restrictions to water service (QS13)	Radioactivity (QS19)		Interruptions (QS26)
Distance to households (public taps and standpipes) (QS6)	Days with restrictions to water service (QS14)			Billing complaints (QS27)
Quantity of water consumed (QS7)				Other complaints and queries (QS28)
Population per public tap or standpipe (QS8)				Response to written complaints (QS29)

Figure 3. *Proposed performance indicators for quality of service (Alegre et al, 2000, categorization by the authors).*

The SERVQUAL model of perceived service quality suggests ten (10) underlying components to a customer’s overall perception of service quality (Zeithaml, Parasuraman & Berry, 1990; Westerhoff et al, 1998): (1) tangibles, (2) reliability, (3) responsiveness, (4) communication, (5) credibility, (6) security, (7) competence, (8) courtesy, (9) understanding, and (10) access.

Examples of recent development in customer-orientation. The importance of customer-orientation has been recognized for a long time especially in the United States, perhaps due to the long tradition of ‘market-orientation’ and strong public relations approach in most service provision areas. It may be argued that in some aspects the consumer protection legislation in the USA has gone even too far.

Customer principles in the USA. AWWA has prepared a model for utilities to develop their own customer principles (AWWA, Consumer principles). The public notification regulation was revised in May 2000. Owners and operators of public water systems must give notice to people whom they serve whenever a National Drinking Water Regulation is violated. Public notification is meant to ensure that consumers always know of any problem related to their drinking water. However, public notices are not required for violations of the reporting regulations or for violations of the Consumer Confidence Report (CCR) regulations (Pontius, 2000). According to the Safe Drinking Water Act (SDWA) each community water supply system is required to provide customers with a Consumer Confidence Report (CCR) at least once a year. The report should describe in plain language the source and quality of the public water supply. Yet, CCR seems to emphasize water quality aspects, ignoring other service aspects that might be as important to the customer. Customers should have a reasonable opportunity to provide input on all utility decisions affecting their drinking water.

Many US water utilities have established Citizen Advisory Groups (CAG). According to Farris (1997), experiences from CAGs are controversial. Many well-intentioned water utilities have gained bad experiences from CAGs, mainly because of selecting wrong people as members or due to too many conflicting interests.

Customer service committees in UK. In England and Wales a centralized and complicated regulatory system was set up as a consequence of privatizing the regional water utilities in the late 1980s. The regulatory body called OFWAT was to establish regional Customer Service Committees (CSC) as a partial effort to protect the customers’ interests. They were to be independent of the privatized water companies and the regulator. The ten (10) CSCs are obliged by law to protect customers by representing their interests and monitoring the service provided by the water companies. They are also responsible for dealing with consumer complaints. The committees are formed of local customers but they are supported by a small team of full-time staff. In addition to regional CSCs, there is also an OFWAT National Customer Council (ONCC) that represents all water customers at the national and European level. It is believed that CSCs can exert considerable pressure on privatized water companies to improve customer relations and service and to get individual customer complaints resolved (OFWAT, 1999).

The new Water Bill (to be enacted into law in 2002) will establish a Consumer Council for Water (CCW) that replaces the CSCs. CCW will be supported by new regional committees. It is intended to be independent not only of the water companies, as ONCC and CSCs currently are, but also of the Director General. While it improves the current situation in many ways, the proposed CCW also raises several concerns. For instance, CCW will not have any powers to resolve customer complaints (OFWAT, 2001).

Benchmarking and QualServe. Benchmarking processes are important for the water utility not only in tracking its performance in comparison to other utilities or looking for areas of improvement, but also in helping identify service areas that are crucial for the customer satisfaction. The American Water Works Association (AWWA) and the Water Environment Federation (WEF) have developed a performance improvement program

called *QualServe*. The program is designed to help water and wastewater utilities achieve total quality performance. Self-assessment, peer review, and benchmarking processes are used to examine 20-26 important areas of utility performance - from planning and financing, to operations, maintenance and customer relations (Lafferty, 2001). QualServe identifies what the utility does well, and areas where improvements can be made, and helps utilities improve both the quality of their product and the service they provide. QualServe's primary goals for drinking water and wastewater utilities are to (AWWA, 2001):

- Increase customer satisfaction
- Improve efficiency
- Reduce the need for additional regulations
- Receive recognition from customers, owners, and regulators
- Harness the knowledge and energy of all stakeholders.

Customer-responsiveness. Water utilities need to keep their customers informed about water quality and quantity, and involve citizens in the decision making on key issues that affect the community significantly. Water utilities have a distinctly public obligation to provide a service essential to public health and well-being and to manage a sustainable natural resource. Involving the public in decision making is integral to fulfilling that public role. This is also important because many drinking water service aspects, such as adequacy of supply, water quality, rates, and conservation, are not only technical issues. They have also social, political, personal health, and economic dimensions. As such, they are best resolved through a process of dialogue between concerned parties and the public.

Thus, water utilities need to become customer-responsive – not only customer-oriented. A responsive customer-oriented public services management model (Figure 4) utilizes the information available in the customer market (Hadley & Young, 1990). Pricing and the customers' willingness and ability to pay the full or subsidized price of service are an important part of customer information. A market-oriented management model depicts a situation where customers (based on their choices), and competitors (based on their action) affect the control and management of the utility. In other words, the operation of the utility is affected by market success. The responsive public service model (Hadley & Young, 1990) aims at making public service production more efficient and effective and also establishing it as an alternative for an ultra-liberalistic private service production. Customer-responsive public services are enabling rather than dependency-creating, holistic rather than fragmented, and open to their participation and influence. Yet, there are also risks in developing open and responsive customer-relations. Utilities have to rethink their customer- and public information strategies after the September 11, 2001 terrorist attacks. Security, vulnerability and risk assessment have become important to water utilities, and may partly have a holding impact on the trend of developing open and responsive customer relations.

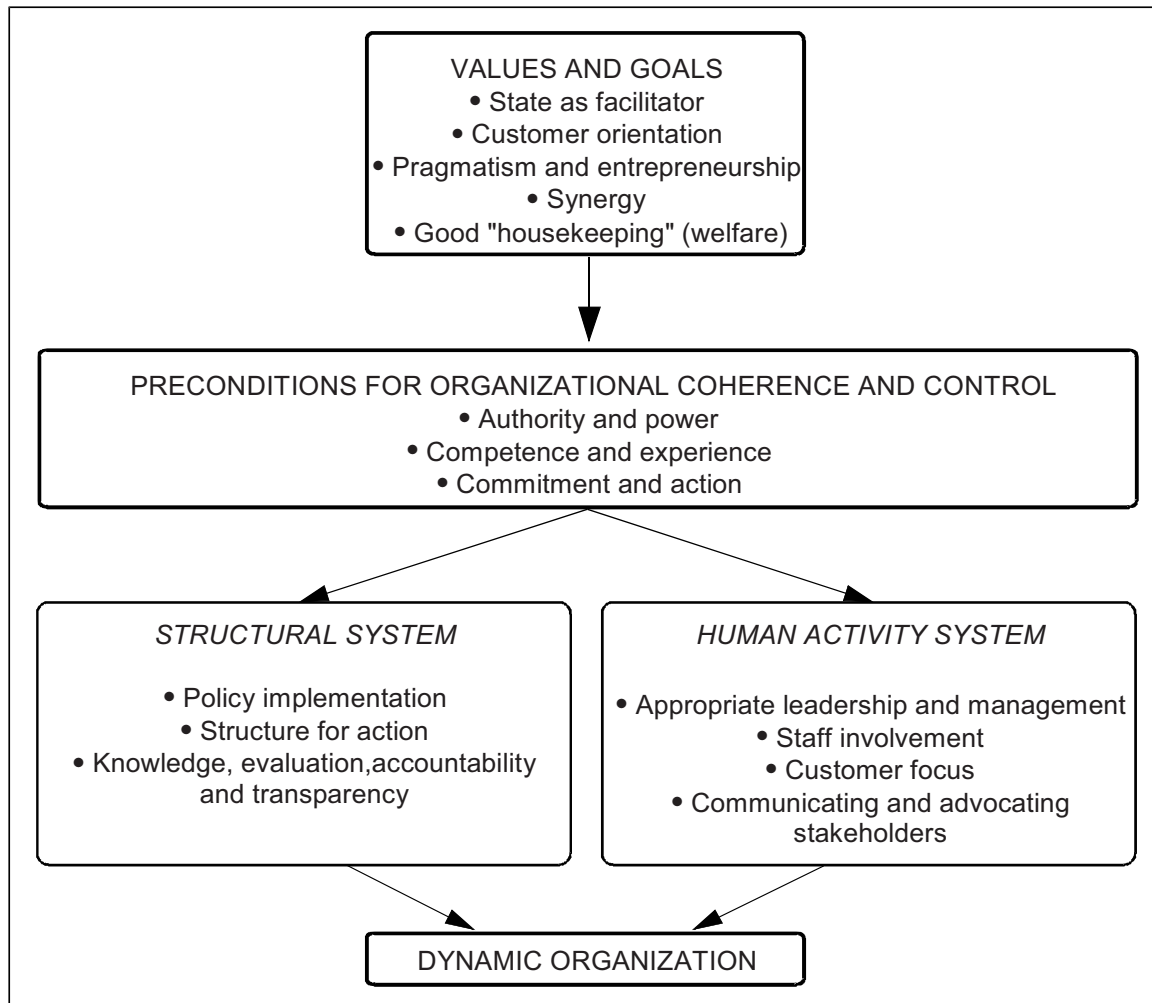


Figure 4. *Key elements of a responsive public services model (modified from Hadley & Young, 1990).*

Customer-management and ownership as a means of improving customer-responsiveness. How far should utilities go in involving customers in their decision making? Some experts hold the view that the monopoly market structure of the water industry presents a clear obstacle to customer orientation and management. Yet, especially in rural setting but increasingly also in urban setting customer management and ownership has shown its strength. The cooperative ownership and management model has successfully been applied, for instance, in rural and small urban water utilities in Finland for decades (Katko, 1992). In Bolivia major urban water utilities are managed as a cooperative under customer ownership, such as the Saguapac cooperative, which serves about one million inhabitants in the city of Santa Cruz. Experiences from both utility performance and customer satisfaction are good (Nickson, 1998a,b). Water cooperatives and other user-owned and –managed utilities especially in rural areas have indicated high level of customer satisfaction and good operational performance. Customers may expect less of smaller utility, but be more satisfied by the service they get. Thus, smaller, user-managed utilities could provide useful lessons for larger utilities to improve their customer strategies and -responsiveness.

There are also successful examples of effective and customer-oriented public water utilities. In Nordic countries the local government (municipalities) mainly owns public water utilities. Customers are indirect owners of the utilities, and therefore, perceive having better possibilities to influence service quality and decision making. Under the prevailing privatization push throughout the world, we should seriously consider the basic values related to utility ownership (Seppälä, Hukka & Katko, 2001). Do customers and communities consider the value added from their ownership, or do they only regard the quality of the service they receive as important?

In Wales the publicly owned non-profit-making company Glas Cymru has had intentions of acquiring the privately owned Welsh Water (Dwr Cymru). Some of the main objectives of such a move are to reduce customers' water bills and to publish performance incentives on service quality and levels of bills. The company is owned by a group of 200 representatives of a broad spectrum of Welsh interests. Although the British water industry does not yet recognize this as an emerging shift from the privatization back to public ownership, the Welsh case clearly shows that customers' interests and expectations cannot properly be met by a fully privatized water market. The extensive and complex regulatory system and customer committees have not been able to improve the situation as expected.

Current policies in developing countries favor the handing over of management of rural and, to some extent, also urban water systems from governments to local communities. Governments with their centralized administration and management structures have not been able to provide and maintain viable services, and the customers' interests and preferences have largely been neglected. Community management by customers' own water users committees has improved the situation, but there are still huge difficulties with sustainability. Community management without ownership of the fixed assets of the water system is still a common arrangement, which makes it difficult for the communities to sustainably operate and, especially, get access to investment financing. On the other hand, asset ownership alone does not guarantee motivated and successful community management and operation of the systems. For large rural piped water systems community ownership together with delegated operation and management by competent private operators could be a successful option in the future.

Future customer-orientation strategies. According to Grant (2000), customer service standards are improving, especially concerning technology, competition and regulation. In the future, information technology will enable customers to receive and utilize data and information about the water system effectively. Competition forces water utilities to optimize their processes and service to make them more cost-effective because cost-effectiveness reduces the need for excessive tariff increases. Regulation will be important to safeguard water quality and ensure customers' confidence in an increasingly competitive service environment. Utilities need to develop customer service strategies. Implementing a public involvement strategy (or customer service strategy) is a long and comprehensive process. Yet, customers include diversified interest groups that cannot be treated as one big mass. Surveys and identification of constraints, problems and expectations of customers take time. Consequently, the definition of objectives, selection of processes and techniques poses another challenge. All in all, the management of the change within the utility and among customers is the most demanding task of implementing customer service strategy.

Customer-orientation involves different levels or steps (Figure 5). On the first step, the customer is offered a holistic solution to his own needs. On the next step the quality of service is improved and value-adding components are incorporated into the basic service package. A few steps higher the truly customer- or partnership-based approach is applied. Thus, a partnership is seen as a long-term learning process in which all parties feel that they are gaining something – a true win-win-situation, where all take part in adding value. Communication, trust and co-operation become crucial (Anttila & Koivu, 2000). Even those countries and utilities that are currently forerunners in customer-orientation are still far from the highest steps of true customer-responsiveness (Figure 5).

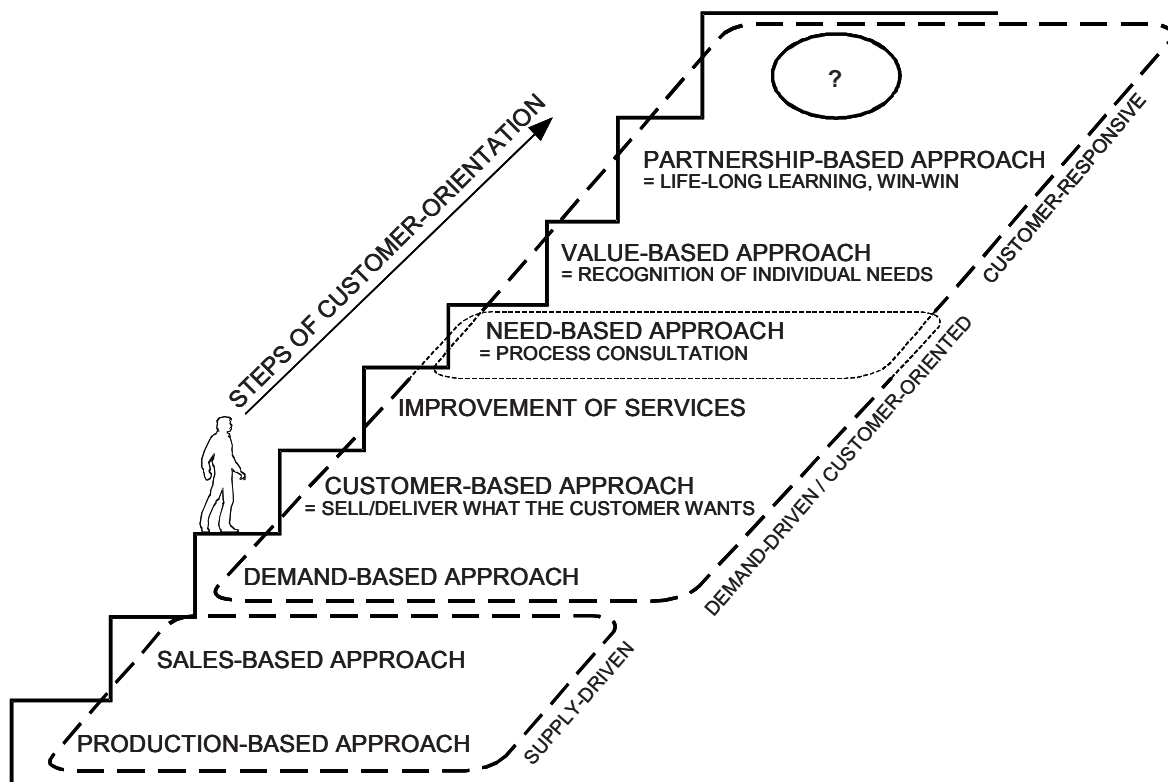


Figure 5. Steps of customer orientation (modified from Anttila & Koivu, 2000).

Case study: Customer orientation in Finland.

Water services in Finland. There are four main institutional options for water and sanitation services in Finland: (1) individual on-site systems in sparsely populated rural areas, (2) small, user-owned water utilities in rural areas, (3) public water utilities in population centers and towns, and (4) inter- and supra-municipal systems through organizational cooperation between municipalities. For instance, some wholesale companies owned by neighboring communities abstract and treat water and sell it to the local public waterworks (Hukka & Katko, 1999).

According to the new Act on Water Services (2001) in Finland, local authorities (municipalities) are responsible for developing and enabling water services within their administrative area. The Municipal Council determines the operating area of public water and sewerage works that provide water services in that area. In Finland water services are usually part of the technical organization of municipalities. The concept of customer is ambiguous: is the customer a citizen or a political decision maker who represents the citizen (Figure 6)? (Heinonen, 1997; Meklin & Näsi, 1994).

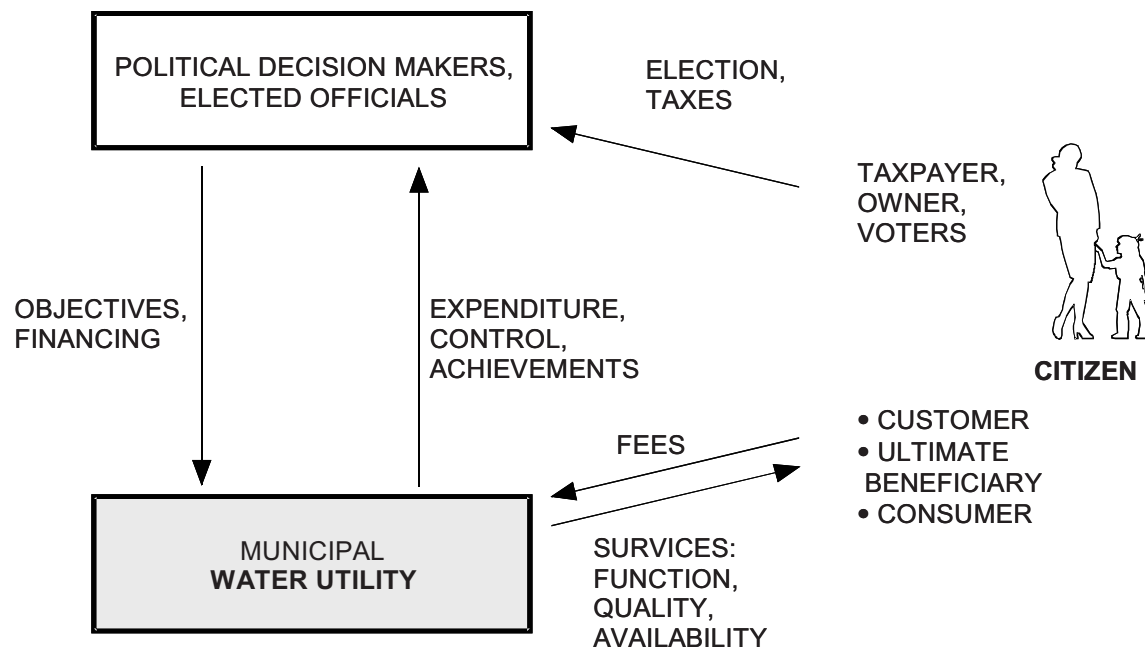


Figure 6. Water services are usually part of the technical organization of municipalities in Finland. (Heinonen, 1997, adapted from Meklin & Näsi, 1994, modified by the authors).

Water utilities nowadays have the responsibility for public information to their customers (Water Services Act 2001). So far, the biggest water utility (Helsinki Water) has full-time information officers, but other utilities likely follow. Customer-orientation is based on the idea that customers themselves define their needs. For the purposes of this case study, customer was defined as a recipient of a product or a service regardless of the share he/she pays for it and regardless of the number of middlemen (Rope & Pöllänen, 1994). In other words, customer is the ultimate beneficiary. The basic idea was that customers form their view on the service quality by comparing their expectations with their experiences. It is essential to know what customers expect in order to be able to meet their expectations.

Research and methods. The aim of this case study was to find out the current status of customer orientation in Finnish water utilities, to compare it with experiences from other countries, and to find ideas for future improvements towards customer-responsiveness. Water utilities of Helsinki (about 550 000 inhabitants), and some other cities in Finland have earlier surveyed expectations and experiences of their customers (Mäkinen, 1996; Mäkinen, 1999; Vehkaoja, 1998; Kilpeläinen, 1998). The case study presented here (Järvinen, 1999) focused on four cities in Finland (Figure 7): Tampere (about 200 000 inhabitants), Lahti (about 96 000 inhabitants), Valkeakoski (about 30 000 inhabitants) and Toijala (about 8 000 inhabitants). This case study was made during autumn 1998 and spring 1999. At first, 14 companies, three managers of apartment buildings, and 89 domestic customers were interviewed in Tampere (Figure 8). Of the domestic customers, four were municipal councilors. The theme interviews were semi-structured: the subject matters were known, but the exact form and order of questions were not defined.



Figure 7. *Location of the cities of the Finnish case study.*

Based on the theme interviews, a questionnaire form was developed. The aim of the mailed questionnaire was to chart customers' expectations and experiences in relation to the operation of water and sewage works. The questionnaire was conducted as an adapted SERVQUAL survey where the idea is to compare customers' experiences and ideal expectations (Zeithaml et al, 1990; Merlo, 1993). The respondents were asked to describe what kind of service they expect from the water utility and what kind of service they have received.

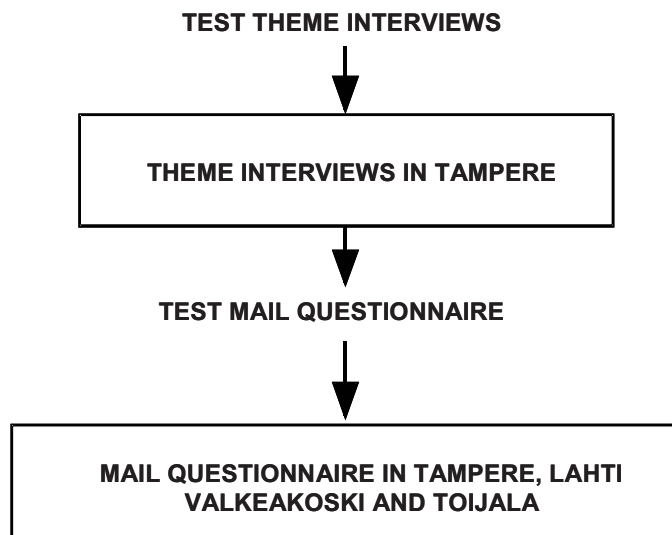


Figure 8. *Procedure of the case study.*

The pre-selected parameters (Table 2: Legend for figures 9 and 10) concerned general aspects of service quality and issues that came up in theme interviews (Järvinen, 1999; Zeithaml et al, 1990). Ideal expectations were evaluated on a scale 1 to 7 (from “no significance” to “absolute requirement”). Experiences were also evaluated on scale 1 to 7 (from “strongly disagree” to “fully agree”). A few open-ended questions were also included to elicit suggestions from the respondents for improving the operations or customer service of the water utility.

A total of 1731 questionnaires were sent out and 492 were received. Twenty-nine were disqualified due to a misunderstanding of instructions or for delayed return. Of domestic customers, those living in one-family houses (n=234) and apartment buildings (n=108) had the highest number of responses.

Case study results. The theme interviews clearly showed that water services are so well organized in Tampere that customers rarely give serious attention to the water utility. Water supply is considered self-evident and is assumed to function properly. The service is fairly ‘invisible’ to the customer. Customers seem to perceive service quality on the basis of the occurrence and handling of exceptional conditions. It is also important that the water utility always takes its customers seriously (Table 1).

There was a clear lack of communication between some large industrial customers and the water utility. Some companies were very pleased that the water utility showed interest in them and they stressed the importance of good customer service. Naturally, some of the interviewed companies were satisfied with, or accustomed to, the current situation, but wanted more information about the water utility and its future plans. None of the companies refused to take part in the interview, which also shows their appreciation towards the water services. Industrial and commercial customers expect the water utility to supply a sufficient amount of good-quality water and the sewers to work properly. They also expect the supply to be reliable in the future. Customer service, long-term contracts and appropriate pricing were also emphasized. It was also stated that if the utility analyzes the wastewaters of a company, the results should always be submitted to the company without a separate request.

Table 1. List of customers' expectations, experiences and proposals for improvements in Tampere. The list is based on the theme interviews.

EXPECTATIONS
• Good and steady water quality.
• Reliability.
• Water supply is guaranteed also in the future.
• Low and steady prices.
• Appropriate price-quality ratio.
• Relevant collection and treatment of wastewaters.
• Information on what can be flushed down to the sewer.
• Consideration of environmental issues.
• Minimize service interruptions (quantity and length).
• Effective and early notice of service interruptions to every house.
• Information of sudden service interruptions too.
• Information on water supply and drinking water quality.
• Utility favors groundwater in water supply when possible.
• Active maintenance and quick repairing.
• Different kind of annual reports.
• Workable notice of defects.
• Pleasant service attitude also in problem situations.
• Faultless functioning of surface drainage.
• Readiness to act in emergency situations.
• Quick construction and renovation.
EXPERIENCES
• Water utility is poorly known.
• There is not enough information available about the utility and its actions.
• Information on service interruptions has not reached all customers.
• There have been some problems with sewers in apartment buildings.
• Giving feedback to utility has been difficult. To whom can you give feedback?
• Newspapers are the main information source about water service issues.
• Surface drainage has not functioned properly.
• Information on price increments has not been satisfactory. (During the study there was an increment in water consumption price.)
• Companies do not get information on analysis results done by utility.
• Personal friendships have an influence on cooperation with the company and utility.
PROPOSALS FOR IMPROVEMENTS
• More information.
• Customer education.
• Water quality reports.
• Better water quality.
• Lower prices.
• Utility should document the feedback it gets.
• Provide information on water quality to customers

Water utility customers were divided into two categories: (1) domestic customers, and (2) industrial and commercial customers. Domestic customers included respondents who lived in one-family houses, row houses or apartment buildings. Industrial and commercial customers included companies and other notable customers like schools, hospitals and managers of apartment buildings. Figure 9 presents the results of the questionnaire sent to domestic customers in Tampere and in Lahti, showing the average values of expectations and experiences. Figure 10 presents respective values of industrial and commercial customers in Lahti and in Valkeakoski.

Table 2. *Legend for figures 9 and 10: Parameters of service quality used in the case study.*

No.	SERVICE QUALITY PARAMETER
1	EASY TO CONTACT
2	HELPFUL AND FRIENDLY STAFF
3	IDENTIFIABLE UNIFORMS
4	WATER QUALITY
5	TASTE OF WATER
6	EFFECTIVE REPORTING OF SERVICE INTERRUPTIONS
7	EARLY NOTICE OF SERVICE INTERRUPTIONS
8	NOTICE OF SUDDEN SERVICE INTERRUPTIONS
9	MONITORING OF CONDITION OF WATER METERS
10	EASY MONITORING OF OWN WATER CONSUMPTION
11	REASONABLE PRICING
12	CLEAR PRICE FORMATION
13	ACCURATE BILLING
14	OPEN REPORTING ABOUT OPERATIONS
15	INFORMATION ON DRINKING WATER QUALITY
16	WHAT CAN BE FLUSHED TOWN THE TOILET
17	INSTRUCTIONS ON PROPER USE OF WATER
18	INFORMATION AVAILABLE, IF NEEDED
19	CONSIDERATION OF ENVIRONMENTAL ISSUES
20	FAULTLESS FUNCTIONING OF SEWERS
21	QUICK CONSTRUCTION AND RENOVATION

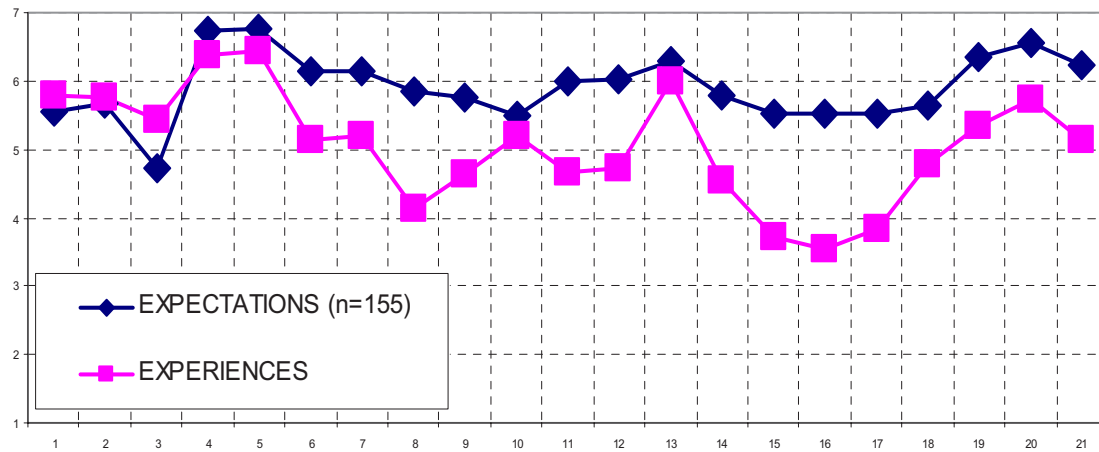


Figure 9. Expectations vs. experiences of domestic customers in (a) Tampere and (b) Lahti.

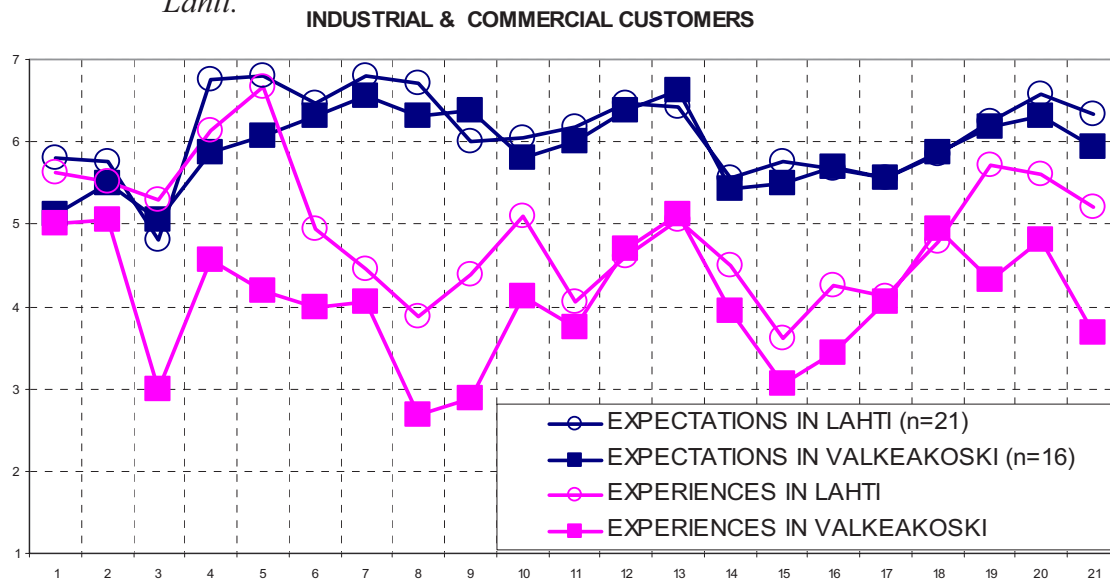


Figure 10. Expectations vs. experiences of industrial and commercial customers in Lahti and Valkeakoski.

The results of the questionnaire showed that there are differences between the customers' expectations and experiences. The results varied slightly by cities, but all utilities seemed to have helpful and friendly staff and were easy to contact. The biggest gaps between expected and experienced services were in information services and education. Customers clearly want more information about the water utility and water services in general. Domestic customers and companies are concerned about good-quality and tasty drinking water, operational sewers, notification about service interruptions, and environmental issues.

The results were quite similar to other studies made in Finland: Helsinki (about 550 000 inhabitants) in 1996 and 1999 (Mäkinen, 1999), Vaasa (about 56 000 inhabitants) in 1996 and 1998 (Vehkaoja, 1998), and Kuopio (about 100 000 inhabitants) in 1998 (Kilpeläinen, 1998). These studies also showed that water utilities and services they offer are not well known. Thus, more public information and education is needed. Although Finnish water utilities have improved their information and communication to their customers, they still have a long way towards a real customer-orientation and true interaction with customers.

Discussion and further research. It is obvious that water utilities are to offer more public information and customer education. It is important that utilities remind customers frequently of the rules and regulations related to the water services. Customers have the right to get the best possible service but they also have their responsibilities. The utility may try to provide so good service that the customers remember it only when paying their water bill. However, if something undesirable happens because the customer has forgotten his duties (for example overflow due to blockage in the customer's own sewer) and regulations are unclear or forgotten, the customer will suffer the consequences.

Water utilities need better strategies for reputation management and public relations. Possible unpleasant situations should be handled by the utility with appropriate measures and right attitude. This requires that the utility allocate adequate resources to customer service functions and education. Full support of the water utility management is of primary importance. Better customer relations and effective operation of the water utility depend on the most essential service quality parameters. Water utilities need to prepare customer service strategies with an aim of providing viable services with successful involvement of satisfied customers.

There are different experiences and development paths in customer-orientation between the countries compared here. In Finland, customer-orientation in public water utilities is still in a fairly initial phase. It is mainly responding to the requirements on information provision as a consequence of the new Water Services Act. In England and Wales, customer representation mainly emerged as a counterforce to neglecting customer interests after privatization of water industry. In the USA, there is a long tradition in customer orientation, presumably because of the market- and PR-approach applied in many service sectors and strong consumer protection legislation. Yet, all these countries are still far from true customer-responsiveness.

Figure 11 illustrates the envisaged development path from production-oriented to customer-responsive services. Customers are becoming responsive full partners in the water supply industry. Their roles and responsibilities as service recipients will continue being important, but increasingly their values and rights will affect the water utility operations, management and decision making. Direct and/or indirect customer ownership will likely gain more support as a counterforce to the current privatization boom.

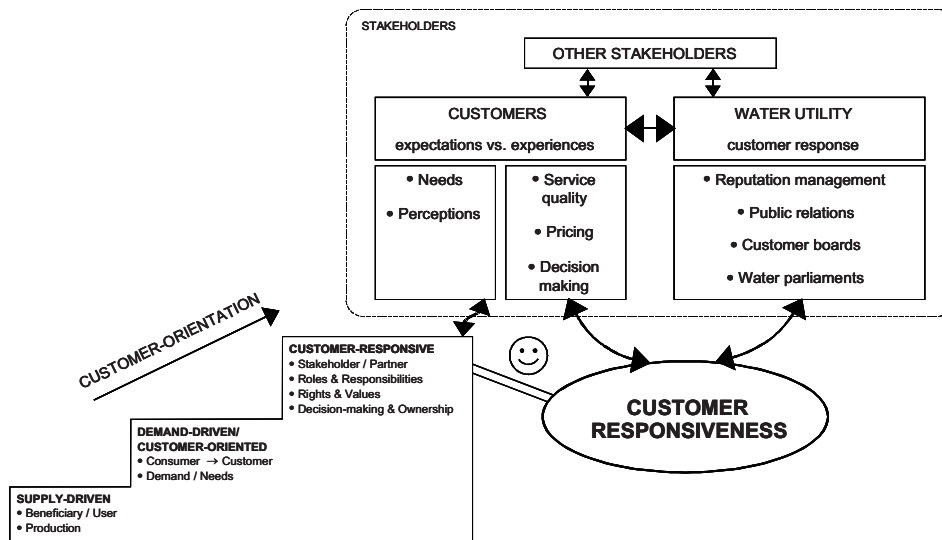


Figure 11. *Development from production-oriented to customer-responsive water services.*

This study implies that more research is needed regarding customers' perceptions in order to identify and quantify relevant results-oriented service quality parameters, particularly effective water demand, to be used in the assessment of levels of service, customer confidence and satisfaction. Performance indicators used in the assessment of water utility performance should incorporate the important factors of viable and good quality water service from the customers' point of view.

Small, user-owned and –managed rural water utilities (water cooperatives etc.) are likely to operate closer to customer-responsive model than most urban public water utilities. A relevant research topic for future would be to compare customer surveys of those smaller utilities with larger utilities. The strengths of customer-responsiveness of user-managed systems, and more professional operations and management of larger public systems could be combined. Public utilities could probably adopt the best customer strategies of user-managed utilities.

The development chain of customer-responsiveness needs further research. As indicated in Figures 5 and 11, true customer-responsiveness likely differs from the current status of customer-orientation by better recognizing the customers' future role in decision making and ownership of their water utility.

Conclusions

Water utilities in industrialized countries (such as the USA and UK) have recently started paying more attention to customers' perceptions, public relations and information. This trend has become stronger also in Finland as described by the case study, but yet customer orientation is still in its initial phase. In developing countries, customer orientation is very limited, especially in urban water utilities. On the other hand, community-managed rural water supply systems truly recognize customer interests. In order to improve operations and (economic) performance, customer-orientation needs to be given more attention also in urban water and sanitation utilities. In the future, provision of water services is likely to be increasingly based on the rights, values, ethics, responsibilities and expectations of all relevant stakeholders. Customers are the core group of stakeholders, and therefore their needs and perceptions are the most important. The fundamental values related to water and sanitation services need to be appropriately taken into account, recognizing that besides their nature as commercial commodity, water and sanitation services have also a strong social impact. These fundamental values and customers' interests easily remain ignored when private ownership and operation of water utilities is strongly promoted. Yet, to fully recognize customers as the key stakeholders, they should also be involved more in decision making, strategic management and ownership of utilities. The next development step from customer-oriented water and sanitation services should probably be customer-responsive: water and sanitation services that consider adequately the fundamental values and ethics attached to the service and also the value added from customers' point of view. On the other hand, increasing concern is recently raised on the security risks of terrorism and vulnerability of water systems, which may force utilities to rethink their customer involvement and public information strategies.

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V

ARTICLE V

Seppälä, O.T., Rodiqi, I., Nyangeri, E.N. and Hukka, J.J.

Visionary leadership and knowledge management in water services.

Journal of Infrastructure Systems (ASCE)

(submitted and tentatively accepted).

Visionary Leadership and Knowledge Management in Water Services

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Abstract: Water utilities need to consider the very long-term in their decision making and management. Visionary management (VM) – based on futures research approaches and methodologies – enables water service organizations to utilize new opportunities in their operations and to manage uncertainties. Often water services organizations do not use modern knowledge management (KM) tools effectively to handle explicit and tacit knowledge. Water utilities need to increase their knowledge base on knowledge management, visionary and strategic management and interlink them in their decision-making and implementation processes. The current situation and experiences from utilization of strategic, visionary and knowledge management tools in the water services sector were studied. The survey included a literature review, an Internet-based Delphi survey, and personal interviews and questionnaires. The survey covered over 30 countries, but more detailed studies were carried out on Finland, Kenya and Kosovo. Short- and medium-term strategic management tools are already applied in many water utilities, but visionary and knowledge management tools and methodologies have not yet been widely applied. Most utilities often implicitly apply some sort of visionary and knowledge management practices, although they are not well aware of theoretical concepts of VM and KM.

CE Database keywords: Water services; Water management; Management methods; Systems management; Knowledge-based systems; Strategic planning.

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Introduction

Water utilities are natural monopolies, and their operations are long-term and continuous. Yet, most water utilities have traditionally not been very futures oriented and, in practice, not very interested in the ethical aspects of socially important decisions regarding water services provision and production. Water utilities also do not manage their knowledge and information processes well in practice, although these are the most central elements of their performance and success. They often lack clear direction and purpose of strategic information collection. Water utilities' experienced staff usually have an enormous amount of *tacit knowledge*, but this knowledge cannot be easily shared and transferred to colleagues and future generations. It has been assumed that most water service organizations currently do not effectively use modern knowledge management tools to handle even the *explicit knowledge* available within their systems and organizations. Medium-term strategic management tools are commonly used in private sector business enterprises, and successful companies increasingly apply futures-oriented principles of visionary development and management. In the public sector visionary and knowledge management are still fairly unknown concepts, although visions and scenarios are often referred to in public sector development plans.

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Contents and objectives

This article starts by introducing a systems thinking view to water services as a prerequisite to a holistic and systemic approach for visionary and knowledge management. Next, the linkage between decision making and management in various time perspectives is emphasized, and evolution of management styles and approaches in water services sector is reviewed. Usually in water utilities decision making and management time span is limited to strategic management (SM). Information and knowledge management (KM) is an essential function in water utility operations, and visionary management (VM) is needed to provide a proactive long-term approach. The article further elaborates on the theoretical basis and essential elements of KM and VM. The obvious linkage between KM and VM approaches and methodologies is highlighted. The article also reports some of the experiences and current practices on the use of SM, VM and KM tools in water sector organizations in various countries. Based on a theoretical analysis and practical experiences, a conceptual model for integrated application of VM as a long-term proactive approach to SM, and KM as the necessary function to support decision making and management in water service organizations in the future is proposed.

Background

Systems Thinking in Water Services

Water services management is a demanding and multidisciplinary task. Although technically rather uncomplicated, water services comprise a complex human activity system. Systems thinking provides a holistic and systemic approach to better conceptualize water services as a complex social system (Godet 2001: 14). Systems thinking concentrates on understanding the relations between the influencing factors and both the “hard” and “soft” elements of the system.

The system of water services consists of both the physical water infrastructure and the management system with all its human activity systems – including the customer interface. In order to better conceptualize the challenges related to managing the critical information and knowledge and required long-term decisions within a water utility, various elements of water utility management are next illustrated in basic systems descriptions. The physical water infrastructure system (Grigg 1996) further includes various subsystems: water supply subsystem, sewerage subsystem, and storm-water subsystem. These “hard” infrastructure subsystems can further be described by their main functions as shown in Fig. 1.

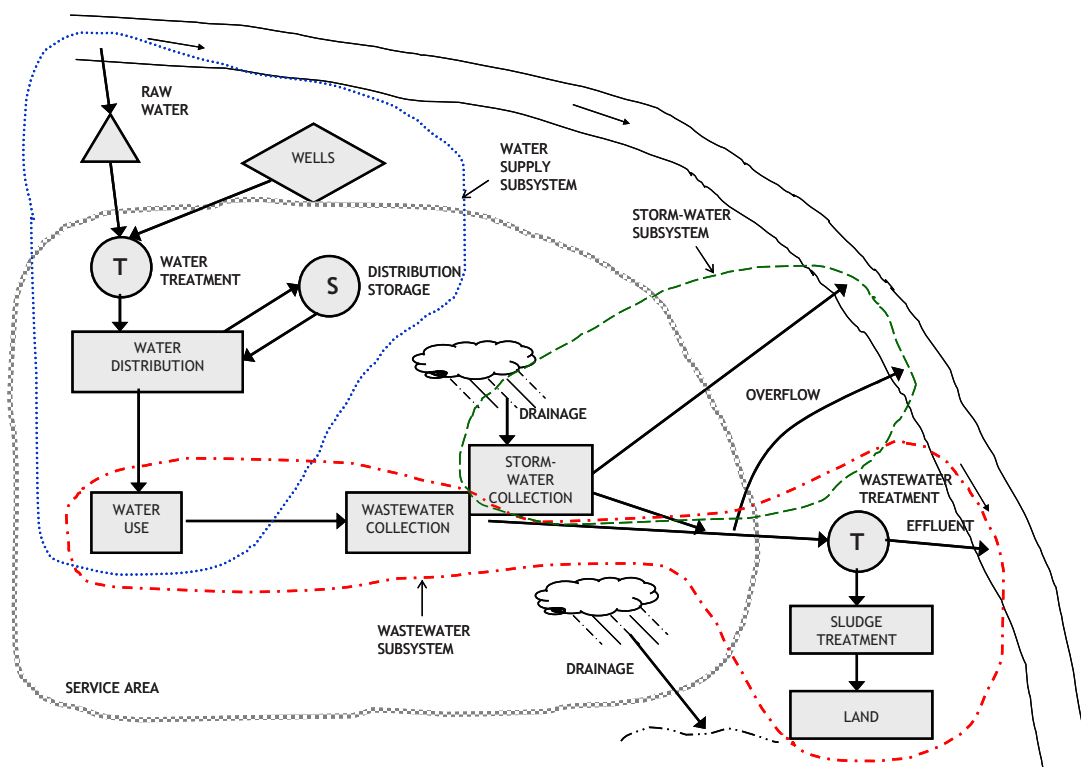


Fig. 1. Physical system description of water infrastructure: (1) water supply (2) sewerage (3) storm-water systems. (modified from Grigg 1996).

In the real world, however, these hard infrastructure systems do not work isolated, but in interaction with many other systems and stakeholders. The “holistic

system description” thus involves more soft human activity systems, including the management and service elements, as described in Fig. 2.

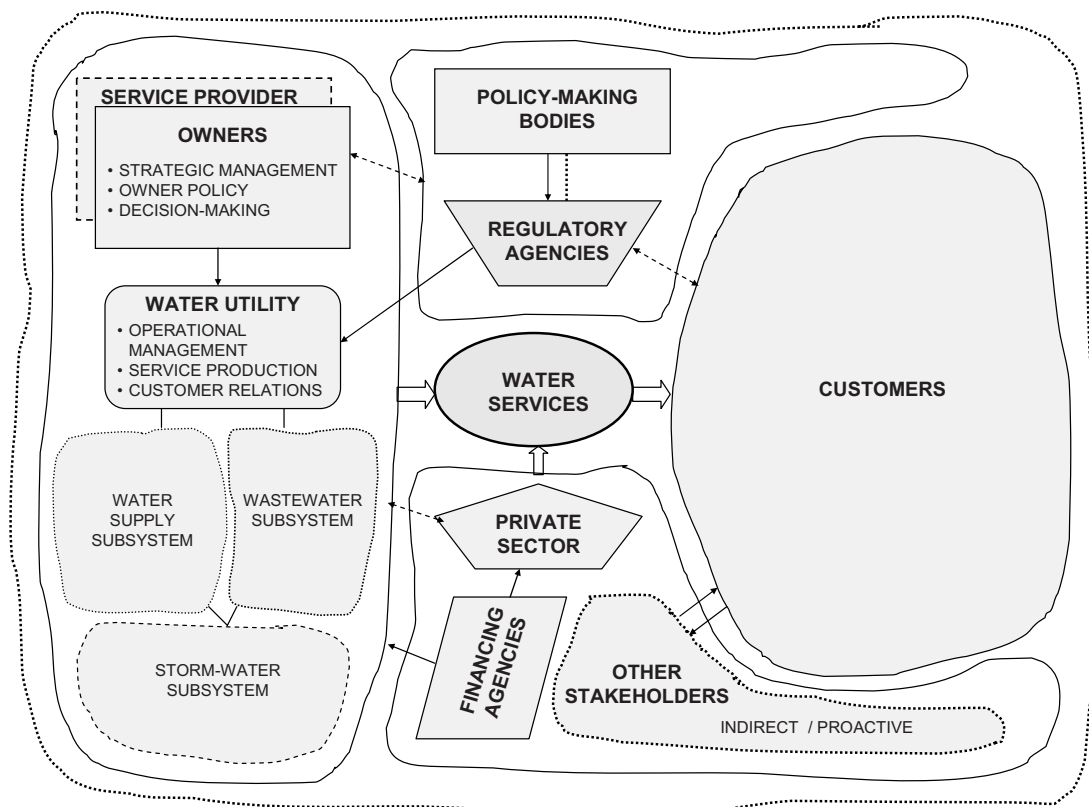


Fig. 2. A holistic system description of water infrastructure and services systems.

Perspectives of Management and Decision Making

Organizations are basically networks of decisions, decision makers and decision making (Choo 1998: 204). One of the main objectives of management is to make good decisions. In order to make good decisions, the organization should define clearly its purpose and objectives. The characteristics of decisions, decision-making models, and management in an organization can be categorized as (1) opportunistic, (2) strategic, and (3) visionary (Malaska and Holstius 1999) (Fig. 3). Opportunistic or operational management focuses on the short-term operational activity at the present time or in the near future (maximum 1-2 years). Preparing for future changes and challenges requires more long-term strategic planning and management (3-5 years). Visionary management is a long-term activity that focuses beyond the foreseeable near future (10-30 years or more). The main challenge of visionary management is to enable the organization to utilize new opportunities in its future operations and to manage uncertainty.

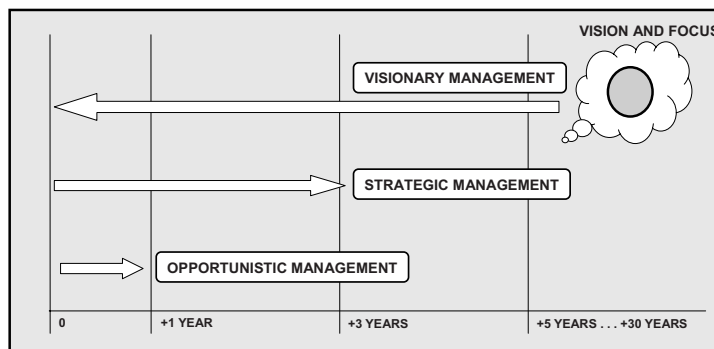


Fig. 3. Relationship between opportunistic, strategic and visionary management (modified from Malaska and Holstius 1999).

Depending on the level of the above-mentioned decision-making hierarchy or time frame, the organization's information system has different requirements.

Decisions at the day-to-day operational level can be based on short-term analysis. For longer-term strategic decisions, an organization needs information about the operational environment to reduce the uncertainty of decisions and to estimate their long-term effects. Forecasts of different information depths are needed to provide adequate information for decision making. In addition to foresight information, an organization also needs to utilize past information. It has to analyze how it is positioned in its previous operational environment and how it has historically reacted on the changes. This enables obtaining information about possible and effective future actions, and possible effects of alternative actions. The amount of information required increases with the time horizon and increasing uncertainty and complexity of the environment and subject (Kaivo-oja, Katko and Seppälä 2003; SGZZ 2003).

Decision making is constrained by the principles of *bounded rationality* and *path dependence*. Strategic decisions inevitably affect available future decisions, development options and paths. Past decisions limit the alternatives for future decisions, but adequate understanding and analysis of the past is important and an essential element of utilizing organizational memory. *Organizational (institutional) memory* is one of the key resources in the decision-making process. Its successful utilization can to a large extent overcome the problems of bounded rationality and uncertainty in future decision making. Tapping the tacit knowledge and appropriate use of knowledge management tools can make organizational memory a concrete resource within an organization (Prusak 1997; Choo 1998; Kaivo-oja et al. 2003). Fig. 4 shows an overall conceptual framework for the role of time horizon in strategic decision making and its impact on uncertainty.

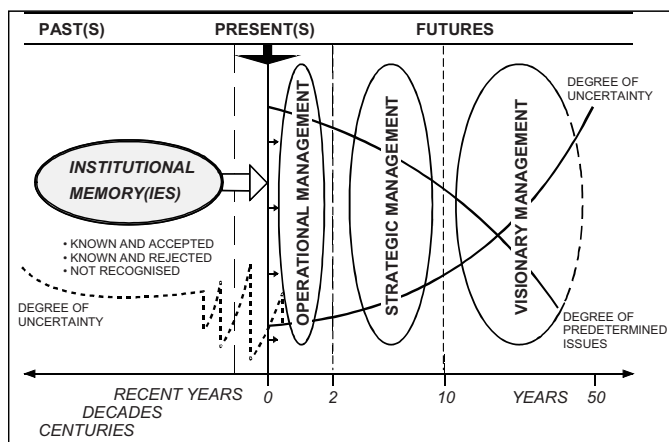


Fig. 4. An overall framework for strategic decision making and management in relation to pasts, presents and futures (Kaivo-oja, Katko and Seppälä 2003).

Evolution of Management Styles and Approaches in Water Utilities

Basically management approaches and procedures should not depend much on whether an organization is a private business enterprise or a public utility (as most water utilities are). Yet, in practice public sector organizations seem to lag behind and follow novel management approaches much later than private enterprises. We can thus predict that some of the management approaches that have already been widely applied in the private sector will become more popular also among the public utilities in the coming years.

Fig. 5 gives an idea of how different schools and concepts of management have evolved in the private sector since the 1950s. Although public organizations have not adopted all of the trends, we can clearly identify similar development – with a time lapse of a number of years. In strategic management, long-term planning (LTP) has evolved to strategic planning (SP) and later to strategic thinking and action (STA) (Kamensky 2000). Interactive management and knowledge management have recently become more important for all types of organizations.

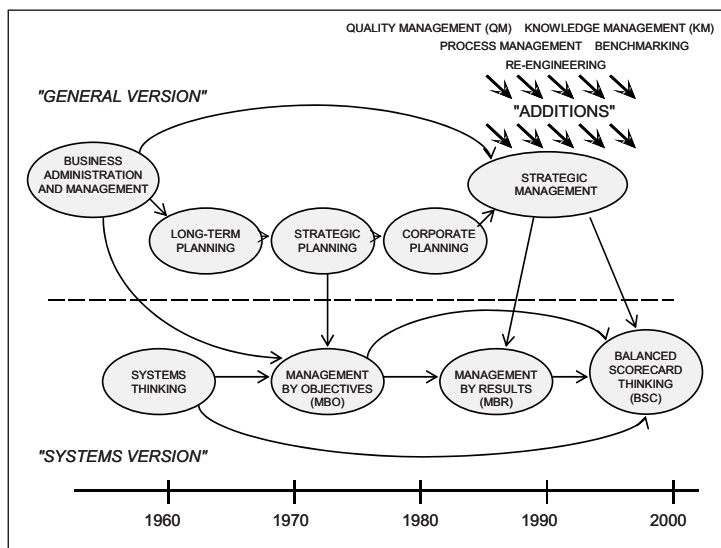


Fig. 5. Evolution of various dominant management approaches in private business enterprises and the subsequent trends in the public sector (modified from Näsi and Aunola 2002: 137).

Strategic management applications – such as Performance Indicators (PI), Benchmarking (BM) and Balanced Scorecards (BSC) – are currently the most common applications in water utilities, as verified by our case studies described later in the article.

Knowledge Management

When a person applies for employment in a company, managers look at his/her CV to check his/her background education and previous experience to verify his/her knowledge. If the person is employed, the company uses his knowledge to produce the expected work output. This process of utilizing personal knowledge has always lived in organizations but rarely identified as a function with potential strength. In the last 10-15 years, the fast changes in our information society have made the value of knowledge a top priority, and the concept of Knowledge Management (KM) has emerged in this environment.

KM is a function in organizations which looks at the processes of knowledge intentionally, systematically and purposefully. For instance, instead of leaving knowledge to reside in several places we intend to bring it in one place or we identify the position of knowledge sources for all employees. In terms of our imbedded knowledge we bring people purposefully to share their experiences and abilities.

There are many different interpretations of Knowledge and Knowledge Management (KM). Knowledge itself can be defined as a “fluid mix of framed experience, values, contextual information, and expert insight that provides a framework for evaluating and incorporating new experiences and information” (Davenport and Prusak 1998). Knowledge management is a systematic approach to controlling the flows of knowledge. It includes identification and analysis of the organization’s available and required knowledge assets and related processes, and the subsequent planning and control of actions to develop both the assets and the processes to fulfill organizational objectives. These processes include developing, preserving, using and sharing knowledge.

The aim of KM is to increase performance through efficient utilization of knowledge resources by creating a system that can deal comprehensively with the organization’s existing and potential knowledge. Price, Solomantine and Velickov (2000) define KM as a process of managing the lifecycle of knowledge relevant to areas that are mission-critical for an organization. Examples of KM applications are Intranets where the knowledge can be shared explicitly within the company, CoPs (Communities of Practice) enabling people with similar interests to share their knowledge and ideas, and knowledge repositories where knowledge of different type can be stored.

Dimensions of Knowledge and Knowledge Management

According to its nature, KM deals with two dimensions of knowledge assets: explicit (tangible) and implicit (intangible) which is usually called tacit knowledge. An organization’s richest and most valuable knowledge is the tacit knowledge of its employees. The share of explicit knowledge is at a maximum 5 per cent, while the share of other forms of knowledge is 95 per cent (Stähle and Grönroos 2000: 105-106). If this tacit knowledge is not properly documented it cannot be adequately transferred to following generations. Nonaka and Takeuchi (1995) have expressed the dynamic process of knowledge creation in the form of a “knowing spiral”, consisting of Socialization, Externalization, Combination, and Internalization (SECI model) (Fig. 6).

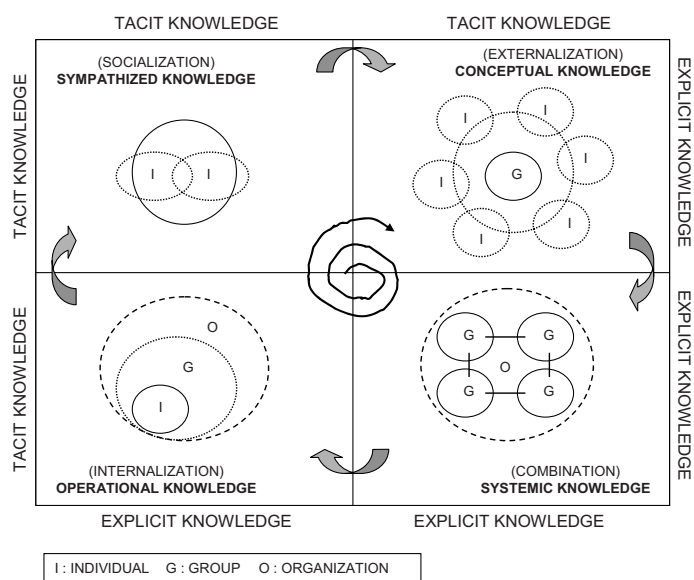


Fig. 6. Contents of knowledge created by the four modes of the “knowing spiral” – SECI model (modified from Nonaka and Takeuchi 1995).

According to the SECI model, tacit knowledge (TK) is first shared with others through learning by doing and learning from the example of others (Socialization). By externalization the tacit knowledge is expressed as explicit conceptual knowledge. Different types of explicit knowledge are combined through documentary exchange, meetings, communication networks, etc. Finally this explicit knowledge stock generates more tacit knowledge through internalization. Information becomes real knowledge and is part of the organization’s shared mental modes.

Knowledge management means formalization of, and access to experience, knowledge and expertise. Two previously mentioned knowledge types are implying two dimensions in KM. First is a social dimension and the second is technological one. In terms of managing knowledge, first of all, there are people who manipulate with knowledge and their activities in managing knowledge are of social nature. Due to the technological development we are also enabled to explicitly manipulate knowledge in documents, models, Data Bases (DB), via communication and in the networks. This is technological part of KM. Traditional KM approaches placed more importance to

technology. Many of these knowledge management systems failed because they neglected the social dimension. Today, approaches to KM are more socially based, more organic and the technology is there to enable the process.

Knowledge Management Processes

Weggeman (1997) proposed a systematic model and approach to implement KM processes (Fig. 7) by creating the Knowledge Value Chain (KVC) (Weggeman 1997, cited by van Daal, de Haas and Weggeman 1998).

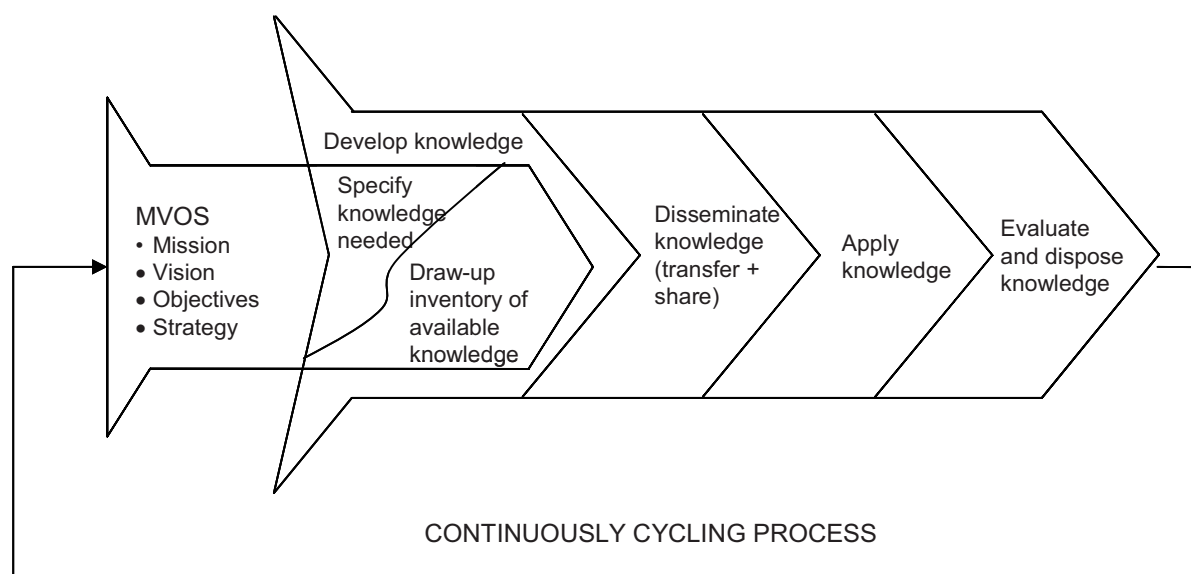


Fig. 7. The Knowledge Value Chain (KVC) proposed by Weggeman (1997, cited by van Daal, de Haas and Weggeman 1998).

To manage this chain means to realize a fundamental KM phases by relying on the most important elements of the organization and perform them continuously in closed loops. Driving forces for knowledge management in Knowledge Value Chain are organizational determinants of mission, vision, goals and strategies. The assumption is that knowledge management should be “mission driven” that will result in collective ambition. In this case, organization can define the needed knowledge. By assessing the actual knowledge and compare with the needed one, the missing knowledge can be found. After this missing knowledge is created the process continues by

sharing of the knowledge and application of knowledge within the organization. At the end of the process resides evaluation task as an input for the new cycle of KVC. Each step in the KVC should take in consideration six organizational elements of strategy, culture, management style, personnel, structure and systems and find appropriate knowledge values for them. In this way overall organization is assessed. This kind of covering – scanning of the organization’s knowledge was proposed by Weggeman (1997).

Tiwana has drawn a description of the knowledge management architecture within the company (Tiwana 2000: 309) by presenting it with seven layers (Fig. 8).

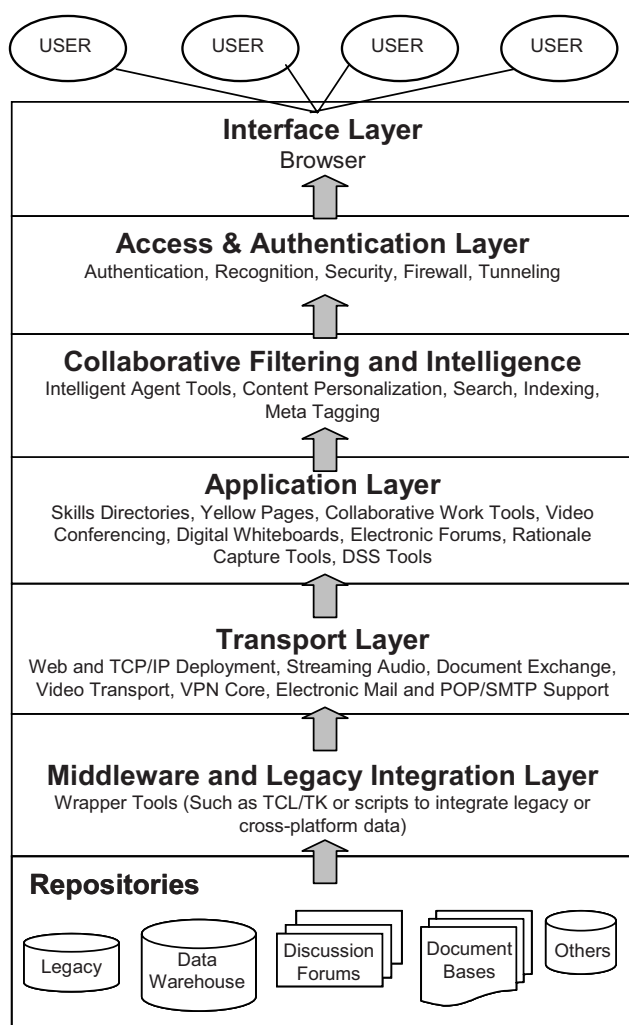


Fig. 8. The seven layers of knowledge management system architecture (Tiwana 2000).

The figure is showing how knowledge management elements are related among themselves according to the technologically needed architecture. Not necessary all of them are in place in KM application. At the bottom are repositories, or accumulated data, information and knowledge. Here also a tacit knowledge relies hidden into the brain repositories. Explicit forms are Databases or Warehouses or Libraries. By going toward a user, technology is asking different standards and protocols, different approaches and tools.

A critical issue in applying KM tools is the awareness and desire to adapt to this new way of working. It is important that people feel relaxed and are willing to share also their tacit knowledge. Resistance by the employees is one of the main difficulties in successful application of KM. The organization needs to design its KM application by adapting it to its organizational environment consisting of corporate planning, budget, personnel and other organizational resources. KM is a demanding function that needs guided coordination of its many activities and it certainly needs to be implemented in an organic manner. The barriers to the use of KM are basically human nature, organizational inefficiency, financial limitations, or security issues. KM does not necessarily have to be established as a business system, but it must essentially serve the organization.

Visionary Leadership and Management: Key Concepts and Methodology

Terminology and Key Concepts

In long-term strategic management organizations develop elements that are applicable also in the visionary management process. Some essential key concepts in strategic management include (1) vision, (2) mission, (3) business idea, and (4) core values. The use of these key elements in a complete strategic management process is described later in Figure 14. Visionary management utilizes the same elements, but it goes a step further than strategic management. Visionary management essentially builds on the principles of strategic management – especially on the shared core vision – but it utilizes more comprehensively the methodological tools of futures research, especially the scenario working process.

According to Wilson and Malaska (Wilson 2001):

“Visionary management is a higher and more participatory form of strategic management. It is characterized by leadership of an organization toward the successful achievement of a dynamic and shared vision of what the organization can, and should, become. It is driven by clear sense of tactics, and a clear sense of the future forces and uncertainties in the business environment. By communicating the vision throughout the organization, visionary management opens up new avenues of managerial and employee creativity, and brings forth an emotional commitment to action that makes future success possible.”

Westley and Mintzberg (1989) defined visionary leadership (VL) as a dynamic, interactive phenomenon instead of a unidirectional process. The key concept in visionary management is the vision itself. Vision is a mental model of a desirable future state for the organization. Visionary leadership means the ability to create and articulate a realistic, credible, attractive, and strong vision of the future for an organization (Nanus 1992). The strategic content of the vision is as important as the strategic context. The strategic context includes all factors that influence the visionary process. Having the vision alone is not enough, but also the process how the shared vision is transmitted and communicated is important. (Westley and Mintzberg 1989; Nanus 1992).

Visionary management (VM) recognizes uncertainty and the need for continuous re-examination of an organization's internal and external environment. VM expands on elements of a framework that comprises

personal and organizational vision and mission, objectives, strategies, Critical Success Factors (CSF), and Performance Indicators (PI) (Rampersad 2001). VM involves a proactive approach to the organization's operations and strategy process. Visionary development and management bring new core competencies and new business opportunities for the organization. This requires new skills, knowledge and resources, which have to be acquired step-by-step in order to achieve the visionary targets set for the organization in its strategy process (Fig. 9).

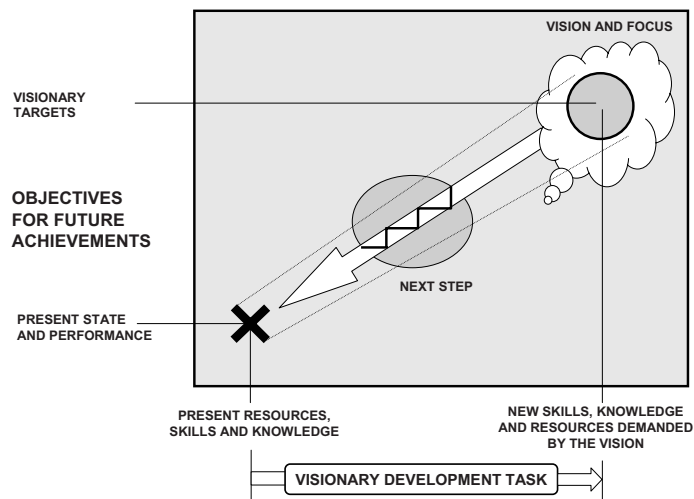


Fig. 9. The “next-step approach” in visionary development (modified from Malaska and Holstius 1999).

Requirements for a Visionary Leader

Water utilities, like any other organizations, face two different roles and tasks – leadership and management. Leadership aims at doing the right things, while management is related to implementation and aims at doing things right (Blanchard 1996; Covey 1996). Shortly, leaders direct and managers execute. Future leaders have to cope with both the leadership and the management role. Both vision and implementation are needed. Future leaders also have to be both effective and efficient. Effectiveness in this connection is related to the organization's vision and direction, focusing on the organization's energy in a particular direction. Efficiency is related to implementation: systems and procedures by which the organization implements its tasks (Blanchard 1996).

Water utilities and other water sector organizations have traditionally been rather conservative in their management and leadership approaches. With new challenges, they also have to renew their strategies in order to become more visionary and futures oriented.

New qualities and characteristics are expected from the future leaders of the water services sector. Future-oriented and visionary leadership in a changing environment requires flexibility, adaptability, and strategic thinking. Skills for negotiating, collaborating, and building trustworthy relationships are critical. A utility manager must be able to predict the effects of internal and external influences, envision the organization's future, and take appropriate action before the outcome is predictable or certain (Bishop 2001). An effective leader should be able to direct people working toward the organization's goal. In general leadership is defined as "influence in an organization setting and facilitating the achievement of challenging organization goals". Thus, visionary leaders should have the following abilities:

- Ability to explain the vision to others
- Ability to express the vision not just verbally but through the leader's behavior
- Ability to extend the vision to different leadership contexts.

According to Nanus (1992), a visionary manager and leader should fulfill the next four key roles that are critical for an effective leader: (1) direction setter, (2) change agent, (3) spokesperson, and (4) coach. In visionary leadership literature, the success-coaching role is usually emphasized. Yet, these four key roles are equally important. An effective leader should balance these roles with respect to the following dimensions (Nanus 1992:10-15): external environment, internal environment, present, and future (Fig. 10). Effective managers are increasingly described as coaches rather than bosses.

Farren and Kaye (1996) have defined five distinct leadership roles: (1) facilitator, (2) appraiser, (3) forecaster, (4) adviser, and (5) enabler. For a visionary leader to be able to support the organization's employees in developing their career and performance, it is important for him to be proficient in all these five roles. These five roles seem to complement well the four key roles presented by Nanus (1992) (Fig. 10).

Changing the behavior of people within the organization is probably the most challenging task. People do not necessarily resist change - they resist being changed. Therefore, it is important to give people time to understand the true needs and the process of change. Leaders should promote open communication and a clear vision of the organization's future. Visionary leaders empower and involve people to achieve the organization's objective.

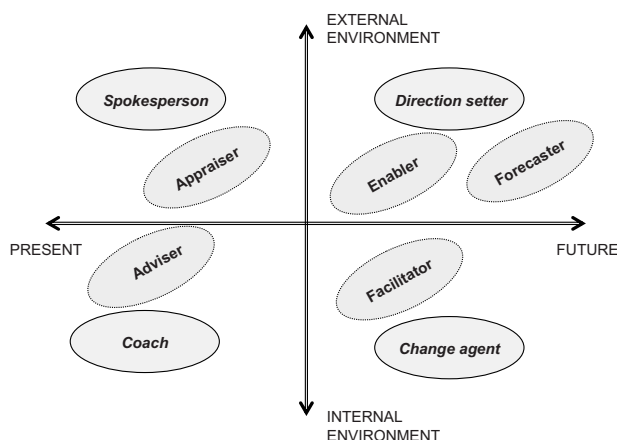


Fig. 10. Visionary leadership roles (modified from Nanus 1992; Farren and Kaye 1996).

Managerial vision and *leadership vision* can be differentiated. Managerial vision may motivate performance improvement, but does not mean leadership. Leadership, on the other hand, does not necessarily require a vision. A leader can change the organization even without a vision – for instance by setting an example or simply pointing out a new direction for the organization. Visionary leadership means a more substantive change, based on an inspiring but concrete vision – pointing out a dramatic change in the organization's direction to fulfill its mission (McCrimmon 2003).

Visionary leaders create a culture or a value system centered upon principles, i.e. they apply principle-centered leadership. In principle-centered leadership models, three basic functions can be assumed: path-finding, aligning, and empowering. Path-finding is based on a compelling vision and mission, by connecting the organization's value system and vision to the needs of customers and other stakeholders through a strategic plan using a "strategic pathway" (Covey 1996). Aligning consists of ensuring that the organizational structure, systems, and operational processes all contribute to achieving the vision and mission and meeting the needs of customers and other stakeholders. "Empowering means that the people within the organization use their talent, ingenuity, and creativity to achieve their common values, vision, and mission in serving their customers and other stakeholders" (Covey 1996).

According to Grigg (1986: 153), a manager in a water service organization must have skills in three key roles: leader, supervisor, and technical manager. The manager must have certain personal skills, some by cause of habit and training and some by virtue of the knowledge gained through education, training and experience. Personal skills needed include time management, interpersonal relations, and good work habits. Leadership should be knowledge-based. Knowledge-based skills include financial management, public relations techniques, and numerous technical skills. Management of water service organizations requires exceptional supervisory skills in day-to-day operations. Supervisory management involves work planning, direction, coaching, and performance review. There are three general categories of technical management: scientific, financial, and technological. Scientific management capabilities include general areas of health and environmental concerns. One of the key requirements of leadership is the ability to make effective and timely decisions (Grigg 1986).

It is important for water utilities to create an organizational culture that allows for both standardization and innovation. Without standardization, the organization cannot utilize automated tools or technologies, while without innovation, organizations will not develop. The innovation strategy should recognize that the total competence and value of an organization consists of the following: (1) financial capital, (2) knowledge capital (= intellectual capital), including human capital and structural capital, and (3) social capital (Tuomi 1999; Ståhle and Grönroos, 2000).

A visionary leader must not only be a visionary with a strategic plan for the utility's future but also be able to communicate that vision and inspire both employees and customers to make it their own. It is important to understand the difference between information and knowledge, and to know how to incorporate new communication tools into strategic management (Bishop 2001).

Visionary Management Methodology

Visionary management can be applied using several methodologies and practical tools. The following are in principle well applicable to water utilities in their strategic and visionary management:

- Visioning process
- Visionary management workshops
- Technology foresight studies
- Systems thinking (such as the Soft Systems Methodology, SSM)
- Scenario process
- Visionary scenario process (VIS).

Visionary Management Workshops

A visionary workshop is a fruitful means of creating the ideas for a vision, developing a "visionary dialogue" and "visionary atmosphere" in an organization and of getting all employees committed to the shared vision and strategies of the organization. Visionary workshops can be arranged according to the principles described by Godet (2001: 91) and Malaska (2001). Godet uses the term "strategic prospective workshop", which in principle is similar to the "visionary workshop" described by Malaska (2001). A one-time visionary workshop is not enough to ensure that visionary thinking and processes are applied as a continuous effort in the organization. A visionary workshop or prospective workshop can be used as the first step in a comprehensive strategic/visionary scenario process, where the problems are formulated and the systems examined. (Godet 2001:76). If applied to a water utility, a visionary workshop can be arranged ideally for a group of about 30 persons for two days. In principle such a workshop can be organized for 10-100 persons, but about 30 is the optimum number. The main group of 30 persons can be subdivided into sub-groups of 5-10 people, which can then work on different specialized themes. Ideally, a visionary workshop has two main phases: (1) exploratory phase and (2) normative phase (Godet 2001).

Soft Systems Methodology (SSM) and Other Systems Methods

Soft systems methodology (SSM) is a general and flexible theoretical framework suitable for problem-solving in real-world situations and in human activity systems that are more or less imprecise (fuzzy) i.e. soft (Checkland 1981; Checkland and Scholes 1999; Mannerman 1991; Hukka 1998). According to Checkland (1981), the concept of a human activity system is crucially different from the concepts of natural and designed systems. SSM is applicable to situations where problems are more strategic than operational by nature. Being a process for managing, SSM assumes that management activities aim at organizing social action. SSM is also a learning process in order to enhance understanding of human situations that are perceived as problematic and where improvements are sought. The learning involves a complex social situation that entails many (divergent) perspectives on the issues to be dealt with – including objectives to be achieved (Finegan 1994). SSM leads to taking purposeful action aimed at improvement in the situation.

Ideally SSM consists of seven stages (Checkland 1981; Finegan 1994; Checkland and Scholes 1999):

1. Defining the *unstructured problem situation*.
2. *Expressing the problem situation* for instance by using *rich pictures*.
3. Selecting how to view the situation and producing *root definitions*.
4. Building *conceptual models* of what the system must do for each root definition.
5. *Comparison* of the conceptual model with the real world.
6. Identification of feasible and desirable *changes*.
7. *Recommendations* for taking action to improve the problem situation.

Although SSM ideally consists of these seven stages, it can be applied flexibly as an iterative process, without resorting to all these stages. In fact, the advantage of all systems thinking approaches is that they need not always be applied comprehensively, but as found appropriate. Mannermaa (1991, 1999) made Checkland's original SSM methodology more applicable to futures research within the framework of the evolutionary paradigm (Fig. 11).

Other soft systems methods related to SSM include Knowledge Analysis and Documentation System (KADS), Viable Systems Model (VSM), and Soft Modeling (SM). KADS methodology is an alternative evolutionary SSM process, which concentrates on modeling the organization or company. KADS includes seven different models that are needed to make the organization knowledge-based. An expertise model is the most essential one (Sreiber 1993). VSM identifies five interacting functional and recursive subsystems and their relationships in its attempt to conceptualize the model of the organizational structure of any viable system. Combined use of VSM and SSM looks promising. VSM can provide the tools and theoretical framework to build a richly elaborated and precise model which can be used for comparison to perceived reality as done in SSM (Britain 2002). SM also has a lot in common with SSM. It addresses a wide range of methods, techniques and tools developed to enhance structured human thinking, in order to support the process of making human reasoning explicit (SGZZ 2003).

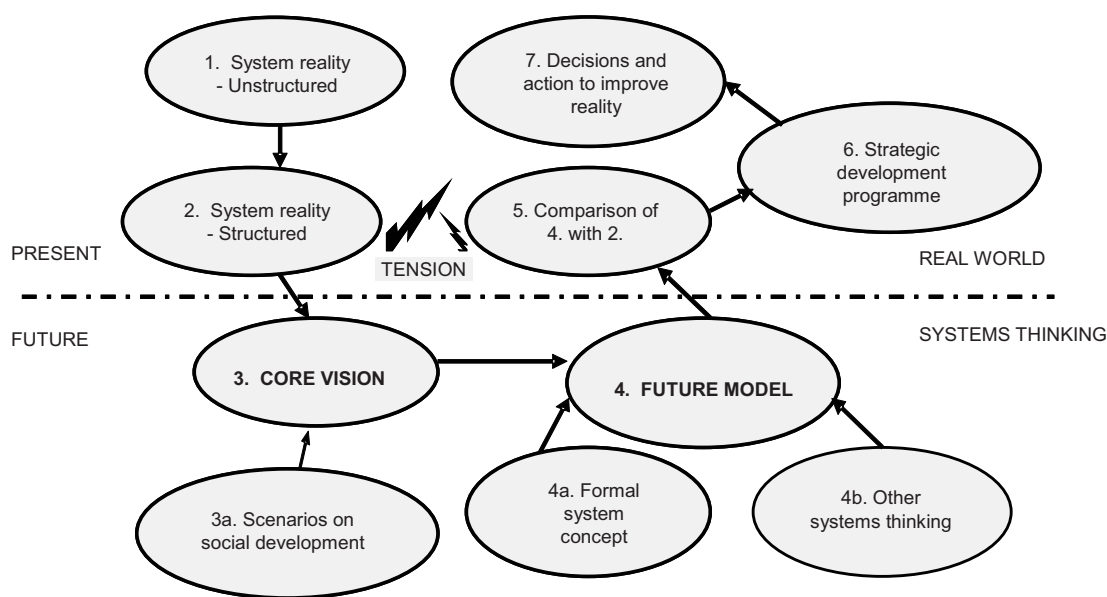


Fig. 11. Soft Systems Methodology (SSM) process in futures research (modified from Mannermaa 1991, 1999; Hukka 1998).

Scenario Process as a Tool in Strategic and Visionary Management

Scenarios. The scenario process is a method for learning about the future by understanding the nature and important driving forces affecting the future. Scenarios are basically like manuscripts about alternative futures, describing the alternative development paths from the present to the future. Good scenarios can be possible, probable, plausible, relevant, coherent, desirable, consistent, transparent, innovative, and surprising (Godet 2001).

Scenarios can be constructed by several methods (Fahey and Randall 1998; Ringland 1999). The common feature of all approaches is that they are based on the theoretical foundations of several disciplines to arrive at a futures-oriented knowledge base. A good process of building scenarios should be interactive, intense and imaginative (Godet 2001). A commonly used process of building scenarios is to start by constructing or using readily available “environmental scenarios” that elaborate the possible worlds and operational environments at a more global level. Sector-specific scenarios or organization-specific scenarios can then be constructed in line with those overall scenarios. The scenario process is essentially a learning process, whereby the participants learn and commit themselves to creative and imaginary thinking about the possible futures for the organization itself as well as the surrounding world. Scenarios should be linked to the organization’s vision, mission and strategies. Scenarios depend on the type of vision adopted, e.g. exploratory, normative or plausible. Strategies depend on attitudes towards possible futures. The attitude may be passive, reactive, pre-active, or proactive. (Godet 2001:66).

Integrated Approach: Scenarios and Strategy.

Scenarios are increasingly used as a strategic and visionary management tool. Nowadays the scenario process is often integrated with the strategy development process (Godet 2001; van Heijden 1996, 1997; Fahey and Randall 1998; Kamensky 2000; Mannermaa 1999; Meristö 1991). In such an integrated approach the use of scenarios, core competence trees and strategic analysis is combined. The objective is to define strategic targets and actions based on the organization’s core competencies according to scenarios that are applicable both to the organization and its general operational environment. The challenge is in attaining the right emphasis between building the scenarios themselves and utilizing the scenarios for developing the strategy. Although the integrated approach has been developed for business enterprises, it is very applicable also to water utilities. A complete

strategic management process utilizing the integrated scenario process is described by Kamensky (2000) as a “strategic architecture” of an organization (Fig. 12).

Visionary Scenario Process (VIS)

The visionary scenario working process (VIS) is a further modification of the applied SSM process developed by Mannermaa (1991) (Fig. 11). VIS provides a practical, systemic, holistic and systematic tool for the strategic and operational decision making of an organization in an uncertain, chaotic and complex environment. By applying the VIS process the uncertainties related to the futures can be coped with better, although they cannot be removed. The VIS process aims at structuring the organization’s present status using the systems concept. Based on possible and plausible future states of the organization core visions and future models are developed. A strategic development program is made for the organization based on a comparison of system models of the present and future state. The VIS process aims at providing concrete support for the organization’s strategic and operative decision making (Mannermaa 1999). The visionary scenario process is also an effective tool in analyzing the “business environment” of water utilities. General environmental scenarios create forward information about the alternative futures and new business opportunities. Water utilities are bound to specific limitations in their operational environment: they are typically extensively regulated (economically, environmentally, public health-wise, and by owner’s strategy). Yet, an integrated knowledge management and visionary scenario process can successfully help in wiping out the future uncertainties and finding appropriate strategies to improve performance. Fig. 13 illustrates a more detailed example of how the visionary scenario process can be applied in the strategy process of an organization (Meristö 2000, 1991).

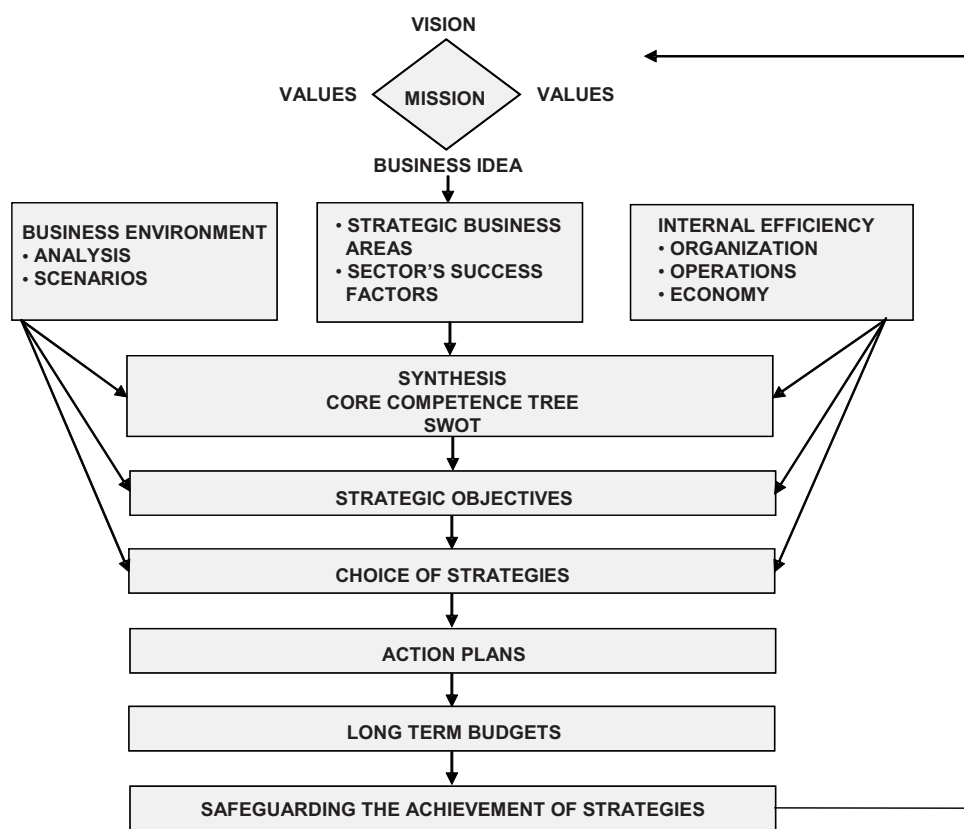


Fig. 12. Organization's strategic architecture and the role of scenario process (modified from Kamensky 2000).

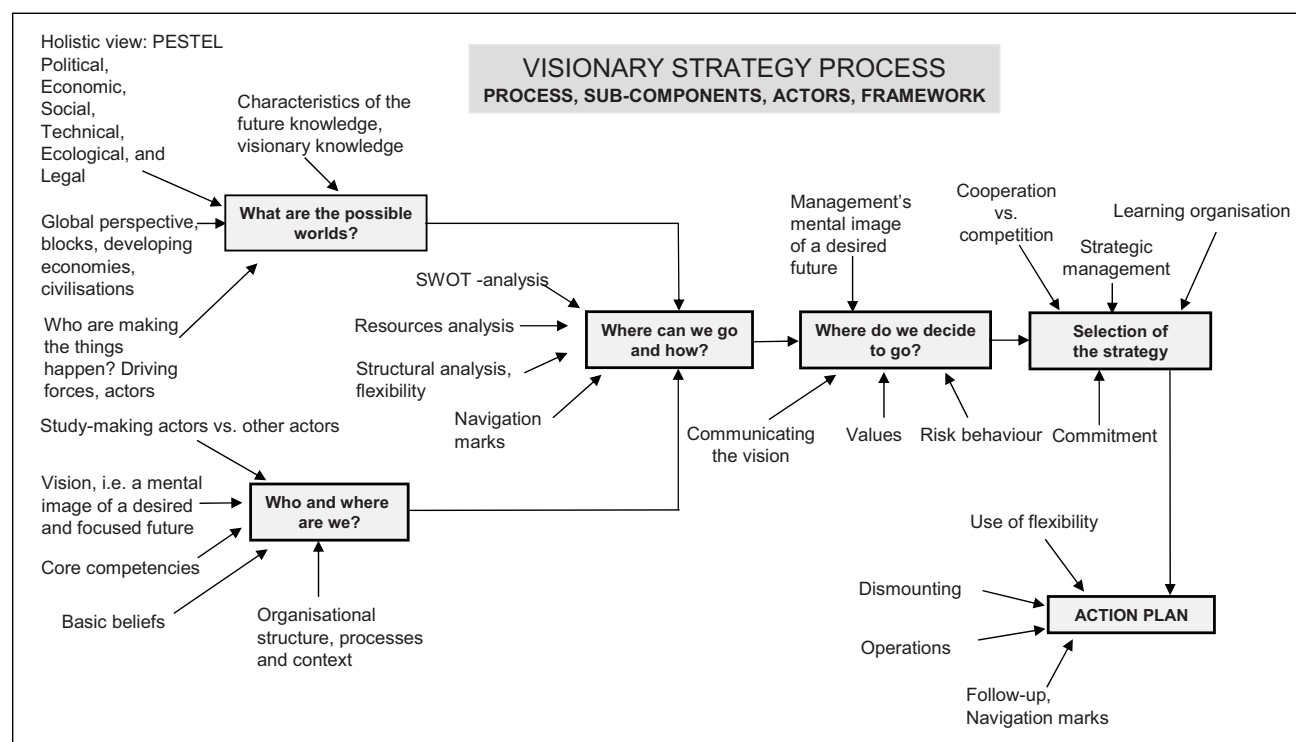


Fig. 13. Application of a visionary strategy process in an organization (modified from Meristö 2000, 1991).

Case Studies: Use of Strategic, Visionary and Knowledge Management in Water Services

The current situation and experiences from utilization of management tools in the water services sector was studied in selected countries. The study included (1) Internet-based Delphi surveys, (2) personal interviews and questionnaires, and (3) a literature review on management applications.

Internet-based Delphi Surveys on Strategic, Visionary and Knowledge Management

Internet-based Delphi surveys were made between March and May 2003 to assess the level of application of various SM, VM and KM tools and techniques in the water services sector. The Delphi survey included 24 questions on eight thematic areas:

- 1) Current use of management styles and practices
- 2) Application of strategic management tools and concepts
- 3) Application of visionary management tools
- 4) Application of knowledge management tools
- 5) Participation in professional networks
- 6) Innovations
- 7) Future needs and demand for VM and KM
- 8) VM and KM in other organizations.

The initial Delphi survey was targeted to 147 water sector experts in over 30 different countries. Participation remained low, as usually with Internet-based Delphi surveys. Only 23 experts responded (15 %) (Table 2). Yet, the information obtained was useful and gave an overall view of the situation with VM and KM applications in water utilities and other sector organizations.

Water services organizations still mainly apply “traditional” management styles and practices, such as Management by Objectives (MBO) (9/23 = 39 % of received responses), Management by Results (MBR) (39 %), Total Quality Management (TQM) (30 %), and Management by Values (MBV) (13 %). Water utilities already commonly apply short- and medium-term strategic management tools. Performance Indicators (PI) (11/23 = 48 % of respondents), Benchmarking (BM) (48 %), and SWOT analysis (43 %) are the most commonly used tools. Balanced Scorecards (BSC) are becoming more popular in water utilities (30 % of respondents).

Water utilities do not yet commonly utilize visionary- and knowledge management tools. Visionary management tools have most commonly been used for strategic decision making purposes (20/23 = 87 % of respondents). Visionary workshops (48 % of respondents), forecasting (35 %), futures workshops

(30 %), decision models (30 %), and visionary scenario process (26 %) are the most commonly used visionary and futures tools. Implicit knowledge management tools (regular group meetings 87 % and informal meetings 56 % of respondents) are still more common than explicit KM tools (Internet, extranets and intranets 39 %, various databases 35 %, modeling 26 %, and Decision Support Systems 22 %). Water utility staff use local and international professional and personal networks effectively to obtain and share new information. Informal networks are also important in transferring tacit knowledge and disseminating innovations among colleagues. Water utilities adopt new innovations rather actively, but several resource constraints suppress innovations (inadequate time, money, etc.).

Water utilities see their need for applying visionary and/or knowledge management procedures in future in a variety of ways. Some foresee little need for visionary management but a continued need for knowledge management. Some see that VM is needed to maintain ambition and prepare for uncertainties, and that KM is needed to keep up with technological development and human resource challenges.

Field Studies in Finland, Kenya and Kosovo

Delphi surveys were complemented by personal communication with selected water utilities and experts in Finland, Kenya and Kosovo to assess their current understanding and use of management tools. In Finland seven, in Kenya five and in Kosovo ten experts were interviewed.

In all three cases most utility experts are not well aware of the theoretical basis, terminology and concepts of VM and KM, although in practice they apply implicit management tools that have features from established VM and KM methods.

In *Finland* in the past, municipal water utilities followed fairly traditional short-term management practices. Recent developments in the water and environmental legislation will have an impact on the working environment and development and management of water services. Especially the Water Services Act of 2001 sets new requirements for water utilities, but other new laws and EU directives also affect the water services sector. The new legislation aims at improving performance of water and sewerage utilities, especially their economic performance, customer services, and health and environmental protection. Thus, water utilities in Finland will have an increasing pressure to improve their management culture and practices.

As a consequence of overall development in the municipal administration, also the biggest water utilities already have during the last five years started preparing their strategy documents, applying some visionary techniques such as visioning and the scenario process. Most commonly these strategy processes have included strategic management elements such as application of Balanced Scorecards (BSC), Critical Success Factors (CSF) and Business Plans. Many water utilities are using Management Information Systems (MIS), Decision Support Systems (DSS), and various ICT based solutions, including artificial intelligence applications and expert systems especially in their treatment process control. Almost all interviewed water utilities have applied Performance Indicators (PI) and have participated in some Benchmarking (BM) activities.

In *Kenya* the water services sector is currently undergoing its biggest reform in decades. A reform is needed, because performance of most public water utilities has been very poor in the past. Even the best performing water utilities do not utilize visionary management tools at all. For instance the incorporated water companies of Nyeri and Eldoret run their utilities in accordance with five-year strategic plans. For periods beyond five years they only focus on technical development aspects such as expansion of distribution systems. Yet, many Kenyan water utilities face increasing uncertainty with regard to availability and quality of raw water in the future. Data and information on water utilities are collected in the operators' record books, but very rarely are these records used for any situational analysis or forward planning. Some of the Kenyan water utilities (Nyeri and Eldoret) already use comprehensive performance indicators and have carried out staff training to reflect their new corporate image. In general, Kenya does not yet have a knowledge management culture and the valuable tacit knowledge of water utilities is very poorly transferred to fellow employees or future generations.

Kosovo has presently 32 municipal water utilities, which are managed in a very traditional way, influenced by the former socialist Yugoslavian regime. Utility managers largely regard the technical infrastructure as a solution for all problems. Management and leadership have not been recognized as a critical issue and these skills are generally poor at all levels. Usually even common contemporary techniques and methodologies are not used. Changes are mainly coming through initiatives from international donors, who have recently introduced Management Information Systems (MIS), Databases (DB) and Geographic Information Systems (GIS). Established knowledge management and visionary management tools are not used at all. There are no Internet-based networks and companies produce little innovation. The first common knowledge sharing networking activity is the association of water and wastewater utilities, which continuously develops training activities. Good knowledge management practices can be identified in individual cases, such as group meetings or apprenticeship arrangements between the old and younger workers. The main concern is that the present managers of water utilities are not aware of the scope of modern utility management approaches and tools. In a state of transition the main challenge is how to prepare the new generation for changes and development. This survey showed strong commitment of the young workers to adapt to the contemporary practices.

There are strong intentions to reorganize the water services sector in *Kosovo*: in the future there may be only 4-6 larger water utilities. In the process of reforming the management developments still focus on technology and on technical solutions. Yet, improvement of leadership and management requires a change in corporate culture and capacity building, including human resources. Under these circumstances proper application of knowledge management and visionary management could potentially contribute to learning processes and increase effectiveness of water services in *Kosovo*. Their gradual involvement brings leverage for change to the old style practices, which is crucial considering the high population growth, and environmental and economic problems in *Kosovo*.

Table 2. Water utilities and organizations included in Delphi surveys, interviews and field studies.

Country / Area	No. of utilities / experts	Name and size of utility (population / connections); (Number of responding experts in other countries)
Finland (Delphi + interviews)	7	Turku, Vaasa, Porvoo, Tuusula (TSV)
Kenya (Interviews)	5	Nyeri, Eldoret, Kitale, Malindi, Tala, Kabuku, NWCP
Kosovo (Interviews)	5 utilities 10 experts	Batllava (>600 000), Prizren (~100 000), Peja (~100 000), Radonic (~100 000), Gjilan (~80 000)
Other countries (Delphi + interviews)	15 experts	Sweden (2), Norway (1), Estonia (2), Latvia (1), Netherlands (3), UK (1), Switzerland (1), USA (2), Australia (1)

Conclusions from Case Studies

Our literature review confirmed our finding that water utilities commonly apply a few strategic management tools, but very rarely any visionary or knowledge management tools. Many water utilities have started to apply Performance Indicators (PI) suggested by the International Water Association (IWA) (Alegre et al. 2000). Merkel (2002) has summarized national contributions from 16 countries regarding Performance Assessment (PA) measures in the water industry.

Cabrera et al. (2002) have presented general guidelines for carrying out metric Benchmarking (BM) in the water industry. Process benchmarking identifies specific work procedures through step-by-step process mapping, and then locating external examples of excellence in these process elements. While metric benchmarking uses detailed numerical, statistical and economic measures to compare the differences between utilities, process benchmarking uses a more holistic approach and compares utilities by examining the methodology behind processes (Kingdom et al. 1996). The World Bank's Water and Sanitation Division has established a water and sanitation benchmarking database and toolkit especially for developing countries (World Bank 2000). Similar benchmarking databases have been developed e.g. by the Asian Development Bank (Mcintosh and Yniguez 1997) and the Water Utility Partnership in Africa (WUP Africa 2003).

The Balanced Scorecard (BSC) is a performance measurement system that translates the organization's vision and strategy into action by defining and measuring its Critical Success Factors (CSF). BSCs

emphasize the strategy-driven nature of goal setting. Yet, a BSC is in essence only an advanced tool of Management by Objectives (MBO), which cannot replace other key elements of strategic and visionary management, such as mission, SBA thinking, analyzes, and competition strategies (Kamensky 2000: 190). The BSC is an applicable tool for water utilities especially since it emphasizes the customer perspective, which often has been neglected or inadequately considered in water utilities. The BSC combines a holistic approach of improved business practices and effective human/organizational strategies and actual performance information for operational decision making. Performance Assessment (PA) alone does not improve performance or make a utility competitive, but combined with an appropriate business strategy and performance improvement initiatives, it can initiate change (Johnson 2002). Tynan and Kingdom (2002a) have studied the use of the BSC in water utilities in various countries for instance through electronic discussion on the Internet. The resulting score card is based on data from 246 water utilities in 51 developed and developing countries (Tynan and Kingdom 2002b).

Our Delphi surveys, interviews and field studies confirm that many water utilities already apply short- and medium-term strategic management tools such as Performance Indicators (PI), Benchmarking (BM), Balanced Scorecards (BSC) or Corporate Scorecards (CSC). Visionary and knowledge management methodologies and tools have not yet been widely applied, and water services are in general fairly conservative and "backward-leaning" in terms of adopting recent management methodologies.

Future Requirements and Implications of KM and VM in the Water Services Sector

What does the changing working environment portend for water utilities? There have been several attempts to envision the future trends in the water services sector. These include the Environmental Benchmarker and Strategist (Maxwell 2003) and American Water Works Association Research Foundation (AWWARF) trends (Bishop 2001). Key trends and drivers (for the United States but widely applicable elsewhere) are likely to include the following (Maxwell 2003; Westerhoff 2003):

- Stress toward water resources and increasing focus on conservation and efficient water usage (including water recycling and reuse)
- Changing and broader regulatory requirements and stronger enforcement of regulations
- Economic and financial stress – due to huge infrastructure rehabilitation needs etc. – and causing pressure to increase water prices
- Continuing trend for privatization and outsourcing
- Increased competition and continuing consolidation of the global water industry
- Human resource requirements, changing workforce, and collaborative labor-management relations
- Changing customer and community interests and the growing power of the end consumer
- More sophisticated water information systems
- New water treatment and distribution technologies
- More innovative social and economic water policies
- Increased security and vulnerability concern
- Increased involvement of indirect stakeholders (environmental interest groups, news media, etc.).

Utilities will face increasing pressure to adapt to these new trends. Water utilities and other organizations should prepare for the changes by developing their knowledge base and start utilizing the tools and methodologies of visionary and knowledge management more effectively. One way to improve performance is proper use of information technology (IT) as a supportive medium for change (Westerhoff et al. 1998: 128) and as a base for continuous improvement (Heller et al. in Lauer 2001: 277).

Knowledge management (KM) is an applicable aggregate methodology of IT tools and social techniques that enables organizational knowledge in a utility to be utilized in the most efficient way. KM helps utilities to adapt to trends and changes, and enables achieving efficiency and cost effectiveness in the future keeping in mind the accelerated changes and increasing complexity of the working environment of water utilities. As a supportive system, KM should be designed to be compatible with the following typical features of water services:

- Interconnectivity between technical, social, political, economic, environmental, legal, and health systems (extended PESTEL approach)
- Specific technical structures and facilities
- Specific institutional arrangements
- Specific service for beneficiaries
- Specific economies-of-scale
- Capital-intensive and investment-dominated infrastructure
- Need for continuous maintenance
- Responsibilities for the customers and the society
- Responsibility for the environment
- Responsibility for sustainable development
- Global perspective.

Instead of merely adopting corporate business practices, water utilities should develop their strategy based on the ontology of water services. The new features and changing patterns certainly require more sophisticated technologies, better management practices, increased social events, closer collaboration and better control of flows of information and knowledge in the water industry.

In the water services sector, knowledge management will be needed at three levels: (1) water utility structures, (2) policy-making level locally and regionally, and (3) inter-sectoral level. For water utilities KM is an important driving force in improving efficiency and lowering costs and also for improved coordination with external stakeholders. Other reasons for applying KM are to improve decision-making processes and to store and sort accumulated past knowledge and present data and information. These needs are largely related to the infrastructure, because successful KM requires developed technical infrastructure. Active KM is essential also for effective risk management (Prusak 1997: 251). Risk management is becoming increasingly important for water utilities due to several reasons: the need to safeguard water resources, water quality risks, financing risks, infrastructure vulnerability, disaster preparedness, risks of terrorist attacks, and damages to properties due to infrastructure failure (Grigg 2003).

At the policy-making level, there is need to coordinate policies, to exchange knowledge, to control environmental, economic, administrative, technological, and other issues. Top decision makers of the water sector must have an appropriate knowledge base to facilitate overall sector development. At the inter-sectoral level many problems are related to lack of information or distorted information flows. KM should facilitate more than simple collation of information. Exchange of best practices, interdisciplinary knowledge and teams, collaboration with universities and other academic institutions, common networks and extranets,

regional and global coordination, and many other activities should be developed through the KM concept. KM can encourage building capacities through the concept of learning organizations (Senge 1990), which is highly appropriate for adult learning and on-the-job training. KM is closely related to social events and organizational culture. Readiness to share knowledge creates an atmosphere of tolerance and increases collaboration. The KM framework assists in coordinating the systems of water utilities and other organizations for improved performance and sector efficiency.

Future visionary leaders of the water utilities and other water services organizations should be able and committed to utilizing KM tools and methodologies. Water utilities will have to undergo a change from traditional management and leadership toward *e-leadership*. Future utility managers need to be *e-managers* who can effectively utilize the opportunities of modern communication and information technology. To be successful, *e-leaders* must have an in-depth understanding of the Internet and other ICT tools and must make them an integral part of carrying out their day-to-day managerial tasks. In addition, top managers can demonstrate their commitment to new communication tools such as instant messaging and

Web-based collaboration software by using the products themselves.

In practice, there should be a close relationship between knowledge management and the various management components in the utility's strategic decision making and implementation – operational, visionary and strategic management. Knowledge management (KM) essentially supports the utility's visionary decision making. Reliable and accurate information is needed to make proper and timely decisions, to monitor performance against agreed indicators, and eventually to achieve the set targets for the utility's performance (technical, economic, etc.). The lack of information is one of the greatest obstacles to the development of water utility operations and achieving an efficient utilization of scarce resources. Achieving the vision and related strategic targets requires development of the new skills, knowledge, resources and assets of the utility, which is possible through successful KM (as presented in Fig. 9). Fig. 14 shows our proposed conceptual model, which links KM (as the intellectual capital of the organization) as a necessary function to achieve the organization's performance goals and targets by effective utilization and management of resources and assets.

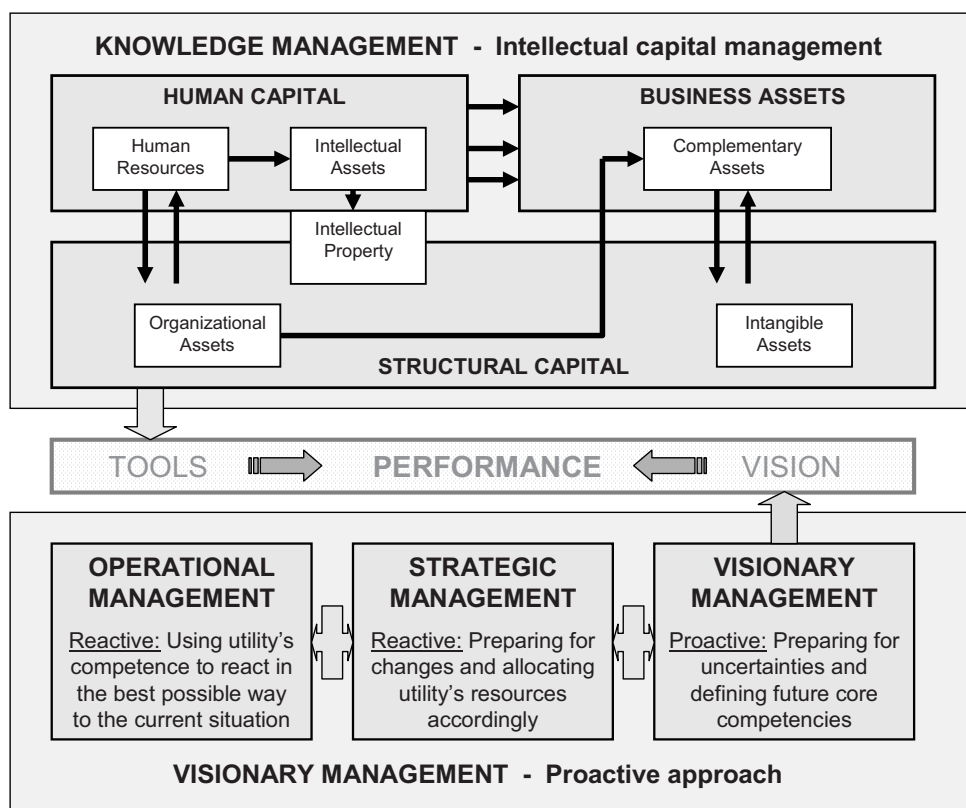


Fig.14. Linkage between knowledge management and visionary management (modified from Wilenius and Aaltonen 2002; Edvinsson and Sullivan 1996).

Concluding Remarks

Most water utilities have traditionally not been very futures oriented, and in practice not very interested in the ethical aspects of socially important decisions regarding water services provision and production. Utilities also do not actually manage their knowledge and information processes well, although these are the most central elements for their long-term performance and success. Thus, an integrated framework consisting of visionary and knowledge management is needed to conceptualize and improve water utility operations. Through visionary management the long-term development of utilities can be ensured, and through knowledge management the utility's human capital can be sustained – including critical knowledge and tacit knowledge.

Water utilities and other water services organizations are on average not well aware of the theoretical basis and concepts of visionary and knowledge management, and do not commonly utilize established VM and KM methodologies and tools in their operations. Strategic management tools such as Performance Indicators (PI), Benchmarking (BM) and Balanced Scorecards (BSC) are already commonly used. On the other hand, many water utilities apply *ad hoc* and implicit management practices that often have features from established VM and KM methodologies.

Operational, strategic and visionary management are interrelated and they all are needed in water utilities' strategic decision making and implementation. In the future water services organizations need to strengthen their long-term visionary development and management processes to look beyond the medium-term strategic management time span. They need a new "VisMan-generation" (visionary management) and "cyber-generation" of visionary leaders and managers in order to be proactive towards future challenges and uncertainties, and to continuously improve the performance of their organizations. Increasing regulation and emerging sector reform processes in many countries require applying VM and KM in order to improve performance and to provide better information for regulatory authorities, owners, customers, and other stakeholders of water utilities. KM is an essential function to support strategic decision making. An integrated application of VM as a long-term proactive approach to SM, and KM as the platform to support decision making and management is required and should be further developed.

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