



SARI JUSI

Integrated Water Resources Management (IWRM)
Approach in Water Governance
in Lao PDR

Cases of Hydropower and Irrigation



ACADEMIC DISSERTATION

To be presented, with the permission of
the board of the School of Management of the University of Tampere,
for public discussion in the Väinö Linna Auditorium K 104,
Kalevantie 5, Tampere,
on April 19th, 2013, at 12 o'clock.

UNIVERSITY OF TAMPERE

SARI JUSI

Integrated Water Resources Management (IWRM)
Approach in Water Governance
in Lao PDR

Cases of Hydropower and Irrigation

Acta Universitatis Tamperensis 1820
Tampere University Press
Tampere 2013



ACADEMIC DISSERTATION
University of Tampere
School of Management
Finland

Copyright ©2013 Tampere University Press and the author

Cover design by
Mikko Reinikka

Layout by
Sirpa Randell

Acta Universitatis Tamperensis 1820
ISBN 978-951-44-9096-5 (print)
ISSN-L 1455-1616
ISSN 1455-1616

Acta Electronica Universitatis Tamperensis 1298
ISBN 978-951-44-9097-2 (pdf)
ISSN 1456-954X
<http://tampub.uta.fi>

Suomen Yliopistopaino Oy – Juvenes Print
Tampere 2013

Preface

Water is a fundamental resource for human life, ecosystems, and the economy. Population growth and accelerating economic development in all water use sectors together with climate change impose huge demands on global water resources. The need for sustainable use of freshwater resources is globally recognised in the water field and literature which has led to developing and researching new approaches to water resources and river basin management. The transition towards more integrated management methods is accelerating in the field of water management. The concept of Integrated Water Resources Management (IWRM), which includes elements of good water governance such as coordination, participation, equity, sustainable development, and inclusiveness, is a generally accepted approach to developing water resources management.

The Mekong River and its tributaries form a source of living for over sixty million people. They constitute one of the richest freshwater fisheries in the world, but are increasingly under threat from accelerating economic development (hydropower, agriculture, tourism, and transport) and pollution. To meet future challenges and increasing complexity, the water sector needs to build resilience into the way water resources are managed at different scales and levels. Therefore it is important to implement integrated management methods in the Mekong region countries, including Lao PDR, to manage their water resources in a sustainable way.

This research aims to contribute to the discussion about water management by looking beyond the much acclaimed integrated water resources management (IWRM) approach along with the main elements attached to it, namely integration, participation, and decentralisation. These elements have been derived from IWRM literature, most importantly the Dublin Principles (GWP, 2004; Rogers & Hall, 2003) and a paper from Xie (2006) which are relevant and core issues as regards the contents of the author's four research articles in the context of the Lao People's Democratic Republic's (Lao PDR's) water regime. Also the political and socio-economic context of Lao PDR has impacted and led to the selection of these core IWRM themes to be studied. The Management and Transition Framework (MTF) approach and the IAD framework give a general and conceptual water management framework perspective

for analysing IWRM. The author's published articles illuminate the implementation process of IWRM from different aspects in various water use sectors. The IWRM principles concerning the operational level of water management are studied in the contexts of hydropower and irrigation.

Several Western and highly industrialised countries have already adapted IWRM approaches with success. In the case of Lao PDR, implementation of IWRM is special and challenging as the country is one of the last communist countries in the World. The country seeks to implement the IWRM approach and related principles in its context and it is interesting to analyse how successfully the elements of IWRM can be transferred and implemented in such a political environment. The single-party socialist republic is built on a top-down government approach. On the other hand, the political context and decision-making environment provide a more 'plain' and simplified institutional environment compared to the complex and multi-stakeholder environments of the West where decision-making is multifaceted with many channels impacting decision-making and organisations are quite free to make and implement their own decisions. In a way, Lao PDR can be seen as a 'critical' case as the experience and lessons learned from Laotian IWRM implementation can increase understanding regarding the mechanisms and processes attached to IWRM processes. The aim is to produce contextualised knowledge on this specific case and to find out the logic behind the action of the IWRM processes.

The articles reveal the importance of local level/bottom up participatory processes to successful IWRM implementation as well as a need for top-down policy implementation. It is crucial to create necessary conditions for the practical implementation of IWRM. IWRM literature widely emphasises the government's role to provide and develop an environment with legal and clear institutional base, public awareness, political will, conditions for all concerned parties, participation, and capacity building system at different levels from local and river basin levels up to national and regional levels. It is also crucial to take the differences in local contexts into account and to support solutions appropriate to a given context instead of universal 'blueprints' as discussed for example by Bach et al. (2011) and GWP (2000).

The author hopes this research increases understanding and stimulates discussion on integrated water management approaches and practices. It aims to enhance knowledge on promoting the wise use, management, and development of water resources towards a more equal and sustainable path.

The author is grateful to all who have provided valuable feedback at different stages of the research. First of all, the author wants to thank Professor Ilari Karppi from the University of Tampere School of Management who supervised the thesis,

for his valuable guidance and encouragement throughout the process. The Author feels deep appreciation for the many Laotian authorities from Water Resources and Environment Administration (WREA), Ministry of Energy and Mines (MEM), especially Director of Executive Planning Division of Department of Electricity, Khamso Kouphokham, who has greatly facilitated research by organising numerous high-level interviews, helping with data gathering and sharing his valuable insights during the FREPLA2020 project. Many thanks belong also to the many consultants and officials working in different development projects and NGOs in the country. The author also wants to thank the FREPLA2020 project director Jari Kaivo-oja and Professor Jyrki Luukkanen from Finland Futures Research Centre (FFRC) of University of Turku for their valuable comments on some of the research articles of the thesis. Many thanks also belong to many colleagues from FFRC and the University of Tampere School of Management who have provided feedback and comments during the research process.

Sincere thanks also belong to author's family; her supporting husband Petri and children Emma and Lauri who have delighted some burdensome thesis-writing days. The author is grateful to her wonderful parents Riitta and Mauri Vilen, and parents-in-law Seija and Taisto Jusi who have provided support and made it possible to find the time necessary to complete the doctoral thesis.

Table of Contents

Abstract	9
Tiivistelmä.....	11
List of Appended Publications	15
Abbreviations.....	16
1 Introduction	21
1.1 Background and Research Framework	21
1.2 Objectives	37
1.3 Structure of the Research.....	38
2 Research Process.....	41
2.1 On Research Methods	41
2.2 Some Research Issues and Problems Related to the Laotian Context	46
3 Water Development and Management in Lao PDR	50
3.1 Socio-Economic Development of Lao PDR	50
3.2 Status of Water Resources.....	54
3.3 Legal and Institutional Framework for Lao Water Governance	57
3.4 Regional Context – Mekong River Basin.....	61
4 What Is Integrated Water Resources Management?	63
4.1 Water Management Issues	63
4.2 IWRM Evolution and Definitions.....	68
4.3 Application of IWRM	72
5 Discussion and Results: Integrating IWRM Elements to the Context of Water Resources Development and Management in Lao PDR	79
5.1 Integration.....	83
5.1.1 Hydropower and Integration	87
5.1.2 Integration at the Regional Level	96

5.2	Decentralisation	98
5.2.1	Some Characteristics of Lao Decentralisation Process	101
5.2.2	Decentralisation at the River Basin Level.....	104
5.2.3	Irrigation Sector – Irrigation Management Transfer.....	109
5.3	Participation.....	115
5.3.1	Some Characteristics of Participation in Lao PDR.....	117
5.3.2	Participation at the Water Sector.....	119
5.4	Postscript: Self-assessment.....	122
6	Key Findings and Conclusions	124
6.1	Developing IWRM	124
6.2	Policy Recommendations.....	129
6.3	Further Research	134
	References.....	135
	Appended Publications	159

Abstract

Water resources are essential for socio-economic development, enabling, for example, hydropower and irrigation. Water resources management and development are expected to become more complex and challenging and to involve new uncertainties as water development increases and accelerates in different water use sectors and is coupled with increasing population, urbanisation, and climate change. Hence, water resources need to be managed in more integrated and sustainable way, both in Lao PDR and in the whole Mekong Basin area. Integrated Water Resources Management (IWRM) has become a universal paradigm of enhancing and promoting sustainable and equal water resources management and use. However, integrating water functions is a very complex task as it involves many actors with different interests.

This research analyses the application of the IWRM approach and the related principles of integration, decentralisation, and participation in the development and management of water resources in Laotian water regime at the water use sectors of hydropower and irrigation. A case study approach was used for the research and for the four appended articles in order to examine hydropower and irrigation sectors, institutional structures, and processes of institutional change – Integrated Water Resources Management (IWRM) at constitutional, organisational, and operational levels. The constitutional level refers to water policy and law, organisational to water resource management, and operational to water use.

The Management and Transition Framework (MTF) and one of its components, Institutional Analysis and Development (IAD) framework, have been used for the research to explore processes, institutions, and actors related to water governance reforms including the adoption of the IWRM paradigm, and to increase understanding of the strengths and weaknesses related to different institutional contexts and levels in Laotian water management. Through Action Situations, IAD and MTF have provided a platform or framework to incorporate actors into the analysis and to produce a richer analysis and understanding of actors involved in the policy arena as well as their features and interactions.

The rhetoric of the IWRM approach is quite well adopted by the Lao PDR but the actual implementation is still halfway. Significant changes to water management policies have been made and new water policies and legislation among environmental safeguard policies have been developed or are under development in the country. Articles related to

hydropower have highlighted the need to integrate social and environmental concerns into national water resource management plans and policies. Lao PDR has initiated decentralisation and participation processes in water resources management: irrigation management transfer to local level (Water User Groups), and establishment of a pilot River Basin Committee in Nam Ngum River Basin to serve as the key organisational unit for water resource management at local and regional levels.

These processes are examined in the articles and analysed in the synthesis part. One aim of IWRM is to improve water governance by enhancing inclusive decision-making to secure more equal water development decisions for all stakeholders, including communities at the grassroots level. However, water resources management is still pretty much centralist by nature and does not properly and truly enhance participation of local level government in the management processes in Lao PDR. Laotian operational environment and political culture ('top-down' governance) represent a unique analysis context for IWRM implementation as it represents one of the last centralised communist regimes and monolithic political/decision-making structures. Therefore, it can provide a more simplified structure, where there are no channels providing local/outside knowledge impacting decision-making compared with complex western governance models. The implementation of IWRM is facing difficulties and constraints, biggest constraints being lack of capacity of water actors and officials especially at lower government (district and village) levels and a sectoral approach to water development and management. In addition, the Government's ability to build capacity to strengthen institutional structures and procedures among policies and laws is weak.

This research on Laotian IWRM aims to enhance understanding regarding the mechanisms and processes attached to IWRM processes. IWRM and the underlying principles of integration, decentralisation, and participation can improve Laotian water regime by developing it towards sustainable and effective modes of water governance. These three core themes or principles are important and relevant for this research and for studying the implementation of IWRM as participation and decentralisation of governance seek to involve communities and local people to decision-making and increasing ownership to manage and develop water resources. Integration of institutional structures among coordination of different administrative levels is highly needed for implementing IWRM. The research emphasises the importance of tailoring IWRM and its core-elements (integration, decentralisation, and participation) to national and local institutional arrangements and capacities in the specific context of Lao PDR.

Key words: Integrated Water Resources Management, Management and Transition Framework, Lao PDR, integration, decentralisation, participation, good governance

Tiivistelmä

Vesivarat, jotka tukevat vesivoiman ja keinokastelun kehittämistä ovat tärkeitä sosio-ekonomiselle kehitykselle. Vesivarojen hallinta ja kehittäminen ovat muuttumassa yhä kompleksisemmaksi ja haasteellisemmaksi vesihankkeiden yhä nopeammin lisääntyessä eri vedenkäyttömuodoilla samaan aikaan väestönkasvuun, kaupungistumiseen ja ilmastomuutokseen liittyvien haasteiden kasvaessa. Nämä haasteet luovat tarpeen vesivarojen integroituun/kokonaisvaltaiseen ja kestäväan kehityksen myös Laosin demokraattisessa kansantasavallassa (Laosissa) ja koko Mekongin jokialueella. Integroidusta vesivarojen hallinnasta on tullut yleismaailmallinen paradigma kestäväan ja tasa-arvoiseen vesivarojen hallinnan kehittämiseen. Vesivarojen toimintojen yhdentäminen on kuitenkin hyvin monimutkainen tehtävä sisältäessään monia toimijoita eri intresseineen.

Väitöskirja analysoi integroidun vesivarojen hallinnan lähestymistapaa ja siihen liittyvien perinssiippien kuten integraation, desentralisaation ja osallistumisen toteuttamista Laosin vesihallinnon, sekä vedenkäyttösektoreista vesivoiman ja keinokastelun kehittämisessä ja hallinnassa. Tapaustutkimus-menetelmää on toteutettu väitöskirjaan liittyvissä neljässä eri artikkelissa, jolloin on tarkasteltu vesivoima- ja keinokastelusektoria sekä institutionaalisia rakenteita, prosesseja ja muutoksia – integroidun vesihallinnan toteuttamista konstitutionaalisella, organisaationaalisella ja operationaalisilla tasoilla. Konstitutionaalisella tasolla viitataan vesipolitiikkaan ja lainsäädäntöön, organisatorisella vesivarojen hallintaan ja operationaalisella tasolla veden käyttöön.

Ns. Hallinta ja transitio -viitekehystä (MTF, Management and Transition Framework) ja siihen läheisesti liittyvää komponenttia institutionaalinen analyysi ja kehitys -lähestymistapaa (IAD, Institutional Analysis and Development) on hyödynnetty veden hallintareformeihin – integroidun vesivarojen hallinnan lähestymistapaan (IWRM, Integrated Water Resources Management) – liittyvien prosessien, instituutioiden ja toimijoiden tutkimisessa. MTF ja IAD-viitekehysillä on pyritty lisäämään ymmärrystä vahvuuksista ja heikkouksista, jotka liittyvät erilaisiin institutionaalsiin konteksteihin ja tasoihin Laosin vesihallinnassa. Hallinta ja transitio -viitekehys sekä institutionaalinen analyysi ja kehitys -lähestymistapa on toimintatilanteiden (action situation) kautta tarjonnut puitteet liittää toimijat analyysiin ja tuottanut mahdollisesti rikkaampaa analyysia ja ymmärrystä policy-areenalla toimivista toimijoista, heidän ominaispiirteistään ja vuorovaikutuskytkennöistään.

Integroidun vesihallinnan retoriikka on varsin hyvin otettu käyttöön Laosissa, mutta sen on tosiasiallisesti toteutunut vielä vaillinaisesti. Maassa on toteutettu merkittäviä muutoksia veden hallintaan liittyvässä politiikassa. Uusia veden hallintaan liittyviä toimintatapoja ja politiikkaa sekä lainsäädäntöä on kehitetty tai ollaan kehittämässä mukaan lukien ympäristöllisiin ja sosiaalisiin suojatoimiin liittyvät toimintaperiaatteet ja -tavat (safeguard policies). Vesivoimaan liittyvät artikkelit ovat tuoneet esille tarpeen integroida sosiaalisia ja ympäristöllisiä kysymyksiä kansallisia vesivaroja koskeviin kehittämissuunnitelmiin ja toimintatapoihin. Laos on aloittanut desentralisaatio- ja osallistumisprosessien toteuttamisen vesivarojen hallinnassa muun muassa siirtämällä keinokastelujärjestelmien hallinnan valtiolta paikallisille vesikäyttäjärhyhmille ja perustamalla pilotti-jokialuekomitean Nam Ngum -jokialueelle, joka voi toimia avainorganiisaationa paikallis- ja aluetason vedenhallinnassa.

Näitä prosesseja on tarkasteltu artikkeleissa ja analysoitu väitöskirjan synteesi-osuudessa. Yksi integroidun vesivarojen hallinnan tavoitteista on parantaa vedenhallintaa edistämällä laaja-alaista päätöksentekoa, jotta vesivarojen kehittämiseen liittyvät päätökset olisivat tasa-arvoisia kaikille osapuolille, mukaan lukien ruohonjuuritaso yhteisöille. Vesivarojen hallinta on kuitenkin varsin keskittynyttä Laosissa eikä se aidosti ja riittävästi edistä paikallistason hallinnon osallistumista hallintaprosesseihin. Laosin toimintaympäristö ja poliittinen kulttuuri (ylhäältä alaspäin toimiva hallinto) edustavat tavallaan uniikkia kontekstia integroidun vesivarojen hallinnan toteuttamisen analysoimiselle, sillä se edustaa yhtä viimeisistä kommunistisista valtioista. Sen monoliittinen päätöksenteko vailla ulkopuolisia, päätöksentekoon vaikuttavia kanavia on yksinkertaisempi tai ainakin yksiuolotteisempi kuin länsimaiset monitasoiset hallintojärjestelmät. Integroituun vesivarojen hallintaan liittyy monia vaikeuksia ja esteitä, joista suurin niistä on vesitoimijoiden kapasiteetin puute erityisesti paikallistasolla (kylä- ja piiritasoilla) sektorikohtainen lähestymistapa vedenhallintaan ja kehittämiseen. Myös valtion kyvykkyys rakentaa kapasiteettia vahvistaakseen institutionaalisia rakenteita, menettely- ja toimintatapoja sekä lakeja on heikko.

Tämän Laosin integroituun vesivarojen hallintaan liittyvän tutkimuksen tarkoituksena on edistää ymmärrystä niistä mekanismeista ja prosesseista, jotka liittyvät integroituihin vesivarojen hallinnan tapoihin. Integroitu vesivarojen hallinta ja siihen läheisesti liittyvät periaatteet: integraatio, desentralisaatio ja osallistuminen voivat edistää Laosin vesihallintajärjestelmää kehittämällä sitä kohti kestävämpää ja tehokkaampaa vesihallintoa. Nämä kolme pääperiaatetta tai teemaa ovat tärkeitä ja tarkoituksenmukaisia tälle tutkimukselle sekä kokonaisvaltaisen vesivarojen hallinta- lähestymistavan tutkimiselle, koska hallinnossa tapahtuva osallistuminen ja hallinnon desentralisaatio pyrkivät edesauttamaan yhteisöjen ja paikallistason ihmisten päätöksentekoa ja lisäämään heidän omistajuutta vesivarojen kehittämiseen ja hallintointiin. Institutionaalisten rakenteiden integrointi ja eri hallinnon tasojen koordinointi ovat tärkeitä kokonaisvaltaisen vesivarojen hallinnan toteuttamiseksi.

Tutkimus on painottanut kontekstin huomioimisen tärkeyttä ja sitä, että integroitu vesivarojenhallinta ja sen peruselementit on mukautettava kansallisiin ja paikallisiin institutionaalisiin järjestelmiin ja niiden toimintakapasiteettiin sopiviksi.

Avainsanat: integroitu vesivarojen hallinta, hallinta ja transiio -viitekehys, Laosin demokraattinen kansantasavalta, integraatio, desentralisaatio, osallistuminen, hyvä hallinto

List of Appended Publications

This thesis consists of this synthesis and the following peer-reviewed scientific publications, which are referred to in the text by their Roman numerals:

- I Jusi, S. (2011). Challenges in Developing Sustainable Hydropower in Lao PDR. *International Journal of Development Issues*, Vol. 10, No. 3, 2011, pp. 251–267. DOI: 10.1108/14468951111165377
- II Jusi, S. (2009). Openings towards Integrated Water Resources Management in Lao PDR. *International Journal of River Basin Management*, Vol. 7, No. 1, 2009, pp. 23–29.
- III Jusi, S. (2006). The Asian Development Bank and the Case Study of Theun-Hinboun Hydropower Project in Lao PDR. *Water Policy*, Vol. 8, No. 5, October 2006, pp. 371–394.
- IV Jusi, S. and Virtanen, M. (2005). Irrigation Management Transfer in Lao PDR: Prospects and Issues. *International Journal of Development Issues*, Vol. 4, No. 2, December 2005, pp. 21–38. DOI: 10.1108/eb045852

The Author is solely responsible for the first three Articles (I, II and III) including the compendium. For the fourth Article (IV), the field studies and writing was done together with Maarit Virtanen who was also working as a researcher for the ‘In Balance’ project in University of Tampere.

Abbreviations

ADB	Asian Development Bank
ADRA	Adventist Development and Relief Agency
AF	Adaptive Foresight
AFTA	Asean Free Trade Area
AMRC	Australian Mekong Resource Centre
APWF	Asia-Pacific Water Forum
AS	Action Situation
ASEAN	Association of Southeast Asian Nations
AWRM	Adaptive Water Resources Management
BDP	Basin Development Plan of the MRC
BOD ₅	Biochemical oxygen demand
BOT	Build-Operate-Transfer
BOOT	Build-Own-Operate-Transfer
CEPT	Common Effective Preferential Tariff
CIA	Central Intelligence Agency
CIA	Cumulative Impact Assessment
CIDA	Canadian International Development Agency
CMI	Northern Community-Managed Irrigation Sector Project of ADB
COD	Chemical oxygen demand
CPR	Common Property Resource
CRBOM	Center for River Basin Organizations and Management
DEPD	Department of Energy Promotion and Development
DESA	Department of Economic and Social Affairs of UN
DESIA	Department of Environment and Social Impact Assessment
DIDM	Decentralized Irrigation & Management Sector Project of ADB
DMH	Department of Meteorology and Hydrology
DOE	Department of Environment
DOI	Department of Irrigation

DPADM Division for Public Administration and Development Management of UN
DSD Department of Sustainable Development
DWR Department of Water Resources
EC European Commission
EdL Electricité du Laos
EGAT Electricity Generating Authority of Thailand
EIA Environmental Impact Assessment
EMP Environment Management Plan
EPD Department of Energy Promotion and Development
EPF Environmental Protection Fund
ESCAP United Nations Economic and Social Commission for Asia and the Pacific
ESIA Environmental and Social Impact Assessment
EU European Union
FAO Food and Agriculture Organization of the United Nations
FDI Foreign Direct Investment
FFRC Finland Futures Resource Centre
FREPLA2020 Futures Resources and Economy Policies in Laos till 2020 Project
GEF Global Environment Facility
GDP Gross Domestic Product
GMS Greater Mekong Subregion Program
GOL Government of Lao PDR
GPAR Governance and Public Administration Reform
GTZ Deutsche Gesellschaft für Technische Zusammenarbeit
GWP Global Water Partnership
IAD Institutional Analysis and Development
ICEM International Centre for Environmental Management
ICT Information and Communications Technology
ICWE International Conference on Water and the Environment
IEE Initial Environmental Examination
IGES Institute for Global Environmental Strategies
IISD International Institute for Sustainable Development
IMF International Monetary Fund
IMT Irrigation Management Transfer
INBO International Network of Basin Organizations

IPCC Intergovernmental Panel on Climate Change
IPP Independent Power Producer
IRN International Rivers Network
IRWR Internal Renewable Water Resources
ISH Initiative on Sustainable Hydropower
IWMI International Water Management Institute
IWRM Integrated Water Resources Management
JPoI Johannesburg Plan of Implementation
LMB Lower Mekong Basin
Lao PDR Lao People's Democratic Republic
LDC Least Developed Country
LEnS The Lao Environment and Social Project
LNMC Lao National Mekong Committee
LPRP Lao People's Revolutionary Party
LWU Lao Women's Union
MAF Ministry of Agriculture and Forestry
MDG Millennium Development Goal
MF Ministry of Finance
M-IWRM Mekong Integrated Water Resources Management Project
MONRE Ministry of Natural Resources and Environment
MOU Memorandum of Understanding
MPI Ministry of Planning and Investment
MRC Mekong River Commission
MTF Management and Transition Framework
MW Megawatt
MWD Mekong Water Dialogue
NAPA National Adaptation Programme of Action
NARBO Network of Asian River Basin Organizations
NCAW National Commission for the Advancement of Women
NCCR Swiss National Center of Competence in Research
NGO Non-governmental Organisation
NGPES National Growth and Poverty Eradication Strategy
NNRB Nam Ngum River Basin
NNRBDP Nam Ngum River Basin Development Plan

NSDS National Sustainable Development Strategy
NSEDG National Socio-Economic Development Plan
NT2 Nam Theun 2 Hydropower Project
NTEP Non-timber Forest Product
NTPC Nam Theun 2 Power Company
NUOL National University of Lao PDR
NWRP National Water Resources Policy
NWRSP National Water Resources Strategy and Action Plan
O&M Operation and Maintenance
PACSA Public Administration and Civil Service Authority
PM Prime Minister
RBC River Basin Committee
RBO River Basin Organisation
REPSI Resources Policy Support Initiative
SEA Strategic Environmental Assessment
SIWI Stockholm International Water Institute
SPC State Planning Committee
STEA Science, Technology and Environment Agency
TA Technical Assistance
TERRA Towards Ecological Recovery and Regional Alliance
THXP Theun-Hinboun Expansion Project
TKK Helsinki University of Technology (now part of Aalto University)
TVA Tennessee Valley Authority
UN United Nations
UNCDF United Nations Capital Development Fund
UNCED UN Conference on Environment and Development
UNDP United Nations Development Programme
UNESCO United Nations Educational, Scientific and Cultural Organization
UNIDO United Nations Industrial Development Organization
UN-REDD+ Reducing Emissions from Deforestation and Forest Degradation
UN-Water UN inter-agency mechanism on water
U.S. United States
USAID United States Agency for International Development
USD United States Dollar

UXO Unexploded ordnance

WARECOD Center for Water Resources Conservation and Development

WB World Bank

WCD World Commission on Dams

WEPA Water Environment Partnership in Asia

WRCC Water Resources Coordination Committee

WRCCS Water Resources Coordination Committee Secretariat

WREA Water Resources and Environment Administration

WRI Water Resources Institute

WSSD World Summit on Sustainable Development

WTO World Trade Organisation

WUA Water User Association

WUG Water User Group

WWAP United Nations World Water Assessment Programme

WWDR World Water Development Report

WWF World Wide Fund for Nature

1 Introduction

1.1 Background and Research Framework

Many countries, including those of the Mekong region, nowadays have to tackle water-related issues in many different areas such as environment, energy, industry, transport, food security, social development, health, and climate. Water problems are becoming increasingly interconnected and intertwined with other development-related issues such as poverty alleviation and regional income redistribution, and also with economic, environmental, legal, and political considerations at local and national levels – sometimes even at regional and international levels (Biswas, 2008, 6; Loucks & Gladwell, 1999, 8). Many of the most difficult problems encountered in water service delivery and management are not actually about water at all, but more likely to concern the political, financial, and institutional issues that surround it (Moriarty, Batchelor, Laban & Fahmy, 2010, 129). Further, increased demand and scarcer resources mean an enhanced risk for conflicts over governance of water resources.

The Mekong Region is undergoing rapid social, economical, and environmental transitions (Varis, Keskinen & Kummu, 2008a, 146). Large-scale hydropower development in the upper and lower parts of the Mekong River Basin are most likely to increase considerably (Keskinen, 2010, 36; MRC, 2009) as well as irrigation development. The Mekong River and its tributaries are seeing increasing plans for water resources development. This means that, firstly, managing planned water development and competing uses of water and, secondly, meeting international responsibilities regarding the shared resources of the Mekong increases the need for effective water resources management and resource conflict solution mechanisms that challenge existing institutional settings and assessment practices (see e.g. Bach et al., 2011; Mekong River Commission [MRC], 2011b).

This adjustment is based on a lengthy period of both theoretical and first-hand empirical research. One of the key findings of the ongoing “Futures Resources and Economy Policies in Laos till 2020” (FREPLA2020) and “Governing the

Development/Environment Problematique: Institutions Balancing between Local Needs and Global Requirements” (In-Balance) projects and this research is that institutional strengthening of all governance scales or levels of natural resources, water included, is needed to ensure sustainable development, management, and use of water. Moreover, there is a need to deal with water management in a more integrated way and to move away from the sector-by-sector approach to respond to complex and increasing challenges. The Lao PDR could, by moving away from centralised management models, adopt enhanced public participation processes. In order to find proper and equitable conflict resolution mechanisms, it is vital to find a balance between local implementation and national policy as well as between bottom-up participatory design and top-down technocratic implementation (GWP, 2004).

Another major challenge requiring policy responses is climate change, which may create unprecedented impacts within the Southeast Asian region, exacerbating existing pressures on land, human settlement, and water resources. The Mekong region has a high reliance on climate-sensitive sectors – agriculture, water, energy (hydro), and tourism with low adaptive capacity to cope with changes in the climate. With a large number of its people dependent on rain-fed agriculture and marine resources, the Lao PDR is highly vulnerable to mounting climate change impacts such as floods, droughts, and tropical cyclones. Extreme weather events are expected to increase in intensity and frequency, causing extensive damage to property, productive assets, human life, and livelihood. (Asian Development Bank [ADB], 2010a, 20.)

It is also recognised that environmental degradation and climate change are major drivers in both forced and voluntary migration, and that this trend is set to continue and substantially increase in decades to come (*ibid.*, 21). These challenges highlight the need for each country in the Mekong basin to have appropriate policies and capacities for water resource management (ADB, 2007b, 1, 2). Also in this respect, the strengthening of national institutional capacity and governance is essential as it would contribute to managing and adapting to climate change and pressures caused by population increase and migration developments (see e.g. UN-Water, 2010).

There are many reasons for the water issues to have arisen on the development agenda in Mekong region countries, including Lao PDR. “Recurring water shortages

and crises (scarcity, droughts, pollution, interstate or inter-sectoral¹ competition around the Mekong river), although often local and temporary, have instilled a sense of vulnerability” (Molle, 2005, 1). Recently there have been many alarming news of descending water levels of the Mekong River and severe water shortages which have had an effect on irrigation, navigation, tourism, health, and overall livelihoods of local people in many parts of the country (Vientiane Times; 5.3.2010; 6.3.2010).

The issue of sustainable water resources development and management is vital for many developing countries where water is an important factor for the country’s economic and social development. This is the case also in Lao PDR. The country has rich and varied natural resources such as minerals, hydro-electric power, and timber. In other words, water plays a very significant role. “It is therefore important that they are protected and exploited in a sustainable manner” (Government of Lao PDR, 2006, 6). “The ongoing economic opening-up of the Lao PDR, coupled with the enormous economic growth in the entire region, puts natural resources in the geographical centre of the region under ever-increasing pressure”. (Messerli et al., 2008, 2; Shaw, Cosbey, Baumüller, Callander & Sylavong, 2007, 8.)

The Lao PDR has been experiencing sharp growth in the generation of hydropower and mineral extraction, which have contributed more than two percentage points of the total of ca. seven percentage points of real annual growth between 2005 and 2009 (World Bank [WB], 2009b, 8). The rapidly increasing mining sector with its high energy demand places further pressure to the development of hydropower. The country faces a challenge in improving its planning and management of water resources, in line with the approach of integrated water resource management at the same time as socio-economic transition and strong water resource development by various sectors is taking place.

IWRM paradigm

Transition towards more integrated management methods and approaches² is accelerating in the field of water management. The many water demand factors and increasing awareness for the complexity of human-technology-environment systems

¹ Inter-sectoral water competition involves issues of water allocation among irrigation systems, urban areas, and hydropower production. Inter-sectoral competition of water in Lao PDR is highly dominated by hydropower development. The Government’s strategies for the water sector are still highly focused on investment targets that are determined at central level. The country’s will is to transform of water into electricity and placing hydropower number one water-use sector. This is supported by the national socio-economic development plans.

² Pahl-Wostl, Isendahl, Jeffrey and Brugnach (2011) have summarized the major arguments that have been put forward to support the need for a paradigm shift in water management.

and environmental problems has triggered the development of new management approaches (Pahl-Wostl, 2007a). “An increasing mismatch between the achieved societal functions as measured by operational goals, expectations, and influence of the context and the expectations and ability of the management regime to achieve its targets is the major driver for change” (Pahl-Wostl et al., 2007a, 18).

“The traditional fragmented or purely sectoral approach is no longer viable” (UN-Water, 2008, 1) and more holistic and integrated approaches have been proposed for water management to incorporate the different water-related issues and perspectives more comprehensively together in order to ensure maximum benefits from the utilisation of the resources. Figure 4, The MTF Class Diagram (Pahl-Wostl et al., 2010, 575), in Chapter 2.1 illustrates this complexity and need for a holistic approach by defining classes of elements of the water system, specifying their attributes, and identifying their relations that are considered important to describe water management systems.

Many of the current water policy reform processes include adopting the Integrated Water Resources Management (IWRM) approach. There is an increasing consensus that IWRM approach can act as the way forward for efficient and sustainable development and management of the world’s limited water resources and for coping with conflicting demands (Global Water Partnership [GWP] & International Network of Basin Organizations [INBO], 2009; Hassing, Ipsen, Clausen, Larsen & Lindgaard-Jørgensen, 2009, 3; UNESCO-WWAP, 2003, 376; UN-Water, 2007, 1; Varis, Rahaman & Stucki, 2008b). It has been also stated that the full potential of water management as a contribution to achieve the Millennium Development Goals (MDGs) can be reached through IWRM (GWP, 2009b, 1, 7).

The principles of IWRM have been developed in large international water-related conferences and events. “Efforts such as the International Conference on Water and Environment (1992), Second World Water Forum (2000), International Conference on Freshwater (2001), World Summit on Sustainable Development (2002), and Third World Water Forum (2003) collectively led to breakthroughs that thrust IWRM onto the political agenda” (Rahaman & Varis, 2005, 15; see also GWP, 2000, 13; Hassing et al., 2009, 3). “Due to the recognition of the UN and various governmental agencies, IWRM now has an ‘official’ status as a management framework” (Keskinen, 2010, 22).

The first authoritative and most commonly used definition of IWRM was made by the Global Water Partnership (2000, 22). It has defined IWRM “as a process that promotes the coordinated development and management of water, land and related resources, in order to maximise the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems.”

Water should also be managed in a basin-wide context, under the principles of good governance and public participation (GWP, 2004, 23). Ioris (2008, 4) has argued that it is important to recognise the close association between sustainable development and the goals of integrated water management.

IWRM is a cogent concept which includes elements of good water governance, such as equity, participation, coordination, sustainable development, and inclusiveness. Based on these principles and led by the World Bank, European Union (EU), and others, something resembling a standard package of water reforms to national water policy and law has been developed. This 'blueprint' package typically includes (but is not limited to): the development of national water policies; the establishment of apex agencies for water management; and the creation of basin agencies typically with some element of stakeholder participation. (International Water Management Institute [IWMI], 2007, 2; Moriarty et al., 2010, 122.) The problem with this approach is that the IWRM model or blueprint may not work identically in different political-economic settings and an existing institutional context needs to be taken into account when applying the IWRM approach (GWP, 2006, 51; GWP, 2000, 6–7).

The cross-sectoral integration between water use sub-sectors and the role of IWRM in their linkage is depicted in Figure 1. An essential element of IWRM is the integration of various sectoral views and interests in the development and implementation of the IWRM framework. Integration should take place within the natural system, which has critical importance for resource availability and quality, as well as within the human system, which fundamentally determines resource use, waste production, and pollution. The human system must also set the development

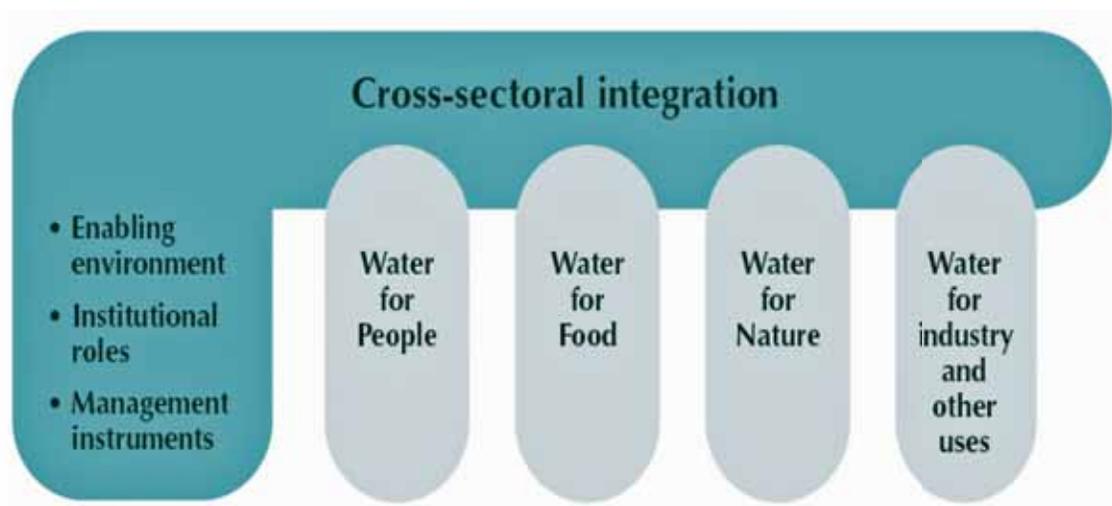


Figure 1: IWRM and its relations to sub-sectors (GWP, 2000, 29)

priorities and control associated infrastructure. (GWP, 2000, 23; Jønch-Clausen, 2004, 17.) The management system of various sub-sectors, including irrigation and fishery (water for food), municipal water supply and recreation (water for people), industry and hydropower generation, navigation, needs cross-sectoral coordination and equitable sharing of water between these different water demands.

In this study, application of IWRM describes more on aspects of cross-sectoral integration between different water use sub-sectors. However, it is important to notice that there are several aspects of integration, but a basic division can be made between human and natural integration. Issues that are relevant to natural integration according to GWP (2000, 23–25) are: integration of freshwater management and coastal zone management; integration of land and water management, “green water” and “blue water;” integration of surface water and groundwater management; integration of quantity and quality in water resources management; and integration of upstream and downstream water-related interests. According to Jønch-Clausen and Fugl (2001, 501) “the integration in the ‘human system’ involves a holistic institutional approach; mainstreaming water in the national economy; cross-sectoral integration in national policy development; linkages to national security and trade regimes; and involvement of all stakeholders across different management levels.”

The IWRM framework and approach recognise that complementary elements of an effective water resources management system must be developed and strengthened at the same time. “These complementary elements (on the left side of Figure 1) include:

- enabling environment – a general framework of national policies, legislation and regulations, and information for water resources management stakeholders;
- institutional roles and functions of the various administrative levels and stakeholders; and
- management instruments, including operational instruments for effective regulation, monitoring and enforcement that enable the decision-makers to make informed choices between alternative actions. These choices need to be based on agreed policies, available resources, environmental impacts, and social and economic consequences.” (GWP, 2000, 30.)

The research at hand is framed around the aspects of human system (water use and management) interaction and integration. The focus of the research is largely on the complementary elements – institutional environment (institutional structure, policies and legal framework, management instruments, etc.) needed for IWRM.

This framing of the research has derived from the contents of the Articles which deal with institutional (IWRM) development and management of Laotian water regime (Article II), hydropower (Articles I and III), and irrigation management (Article IV).

Natural system interaction is an important aspect but not discussed in any great detail in this research due to the framing. However, in the case of integrating water and land, this study approaches the topic by examining management of river basins, which are considered “logical planning units for IWRM from a natural system perspective” (GWP, 2000, 24). In addition, integration of upstream and downstream water-related interests is touched on in hydropower-related articles as hydro dams can have serious impacts on upstream and downstream water flows.

While the IWRM approach is internationally accepted in principle, there is critique about the concept. It has been described equivocal and somewhat loose and it is often seen as too complex, impractical, difficult to understand, and poorly-focused (Australian Mekong Resource Centre [AMRC], 2007; Biswas, 2008; Clemett, Soussan & Mitchell, 2000, 35; GWP, 2009a, 3; Keskinen, 2010; Moriarty et al., 2010, 123). “The IWRM concept is generally struggling with two major weaknesses that cause most of its perceived failings: the nature of the science which has informed its development and its ambiguous character in terms of current intellectual paradigms” (Medema & Jeffrey, 2005, 5 in Jeffrey & Gearey, 2006). As Pahl-Wostl et al. (2007a) argue, one may also question if current water management regimes that have evolved under a very different management paradigm possess the structural requirements needed to implement integrative and adaptive management approaches. Current decision-making structures of water management regimes are seldom flexible – this is the case in Lao PDR – and the long-term, large-scale, and expensive infrastructure leaves little opportunities for adjustments. (Pahl-Wostl et al. 2007a, 7, 9.)

Towards IWRM in Lao PDR

In the past years, the Government³ of Lao PDR has greatly improved its’ water resources management by introducing various legislative and institutional measures to manage water resources efficiently and more sustainably. The country is also receiving international donor support to improve water management. In particular, the Asian Development Bank (ADB) has funded many activities for the introduction of integrated water resources management in the country. Although the elements of a coherent and integrative institutional approach to water resources management, such as the upcoming new edited National Water Sector Policy and National Water

³ In this text, the word government with small g-letter refers to all governments in general. Government with capital letter refers to Laotian government.

Resources Strategy and Action Plan, are emerging and reforming the institutional environment of the water sector, planning and development processes still have a long way to firmly institutionalise an integrated water resources management (IWRM) approach in the country and develop a water regime able to efficiently cope with emerging challenges and complex environment. The causes of the various resource management problems in Lao PDR reflect institutional deficiencies such as the lack of resources, skills, accountability, authority in existing organisations, and in coordinating arrangements as well as the loopholes in the present policies and regulations. These problems came up in many interviews with government officials and participants of FREPLA2020 workshops. To foster socio-economic development, poverty alleviation and to achieve the Millennium Development Goals (MDGs)⁴, Lao PDR needs to focus on harmonising water resources development and management.

The application and implementation of the IWRM orthodoxy in the context of a developing country and particularly in the Laotian political environment is a very challenging and complex task as developing countries need to implement different governance and institutional solutions assumed by the IWRM paradigm. In other words, conversion of IWRM model and related water reforms, produced in a developed country and brought into their system from the 'outside,' into sound practice needs a great deal of resource-demanding preparatory work.

Unlike the assumptions underlying the IWRM, the political culture of Lao PDR is not rooted in a Western democratic world view. This may raise well-grounded questions whether the key principles (and policy processes) of integration, decentralisation, and participation attached to IWRM are transferable and viable in the context of Lao water regime. The country is as an authoritarian one-party state where the Lao People's Revolutionary Party (LPRP) has monopoly of political power. Lao PDR lacks political transparency, openness, and the tradition of bureaucratic administration. According to Stuart-Fox (2005) the political culture of the Party in the country depends to a great extent on personal and family relationships and patronage due to its small size and draws on traditional Lao values and modes of

⁴ The eight MDGs – which range from halving extreme poverty to halting the spread of HIV/AIDS and providing universal primary education, all by the target date of 2015 – form a blueprint agreed to by all the world's countries and leading development institutions. The Program is coordinated by the United Nations Development Programme (UNDP). The MDGs of Lao PDR are: eradication of extreme poverty and hunger, achieving universal primary education, promotion of gender equality and empowering women, reducing child mortality, improving maternal health, combating HIV and AIDS, malaria and other diseases, ensuring environmental sustainability, developing a global partnership for development and reducing the impact of UXO in Lao PDR in accordance with the National Strategic Plan for the UXO sector. More information available: <http://www.undplao.org/mdgs/>

social interaction. “The political culture of the Party is one of compromise and the balancing of competing interests between patronage networks centering on politically and economically powerful individuals.” ‘Democratic centralism’ is a top-down system, in which a tiny elite makes policy decisions. (Stuart-Fox, 2005, 10, 39, 40.) Overall, the lack of democratic accountability and transparency of political organisations and institutions hinders the imbedding of IWRM in Lao PDR.

When power of governance regimes is highly centralised, its adaptive capacity is reduced and functions as a barrier to social learning (Mostert et al., 2007; Pahl-Wostl et al., 2007b, in Pahl-Wostl et al., 2010, 578). Bearing this and the fact that implementation of institutional reforms such as IWRM can be fostered by effective social learning and good adaptive capacity of organisations of water governance regime (see e.g. Pahl-Wostl et al., 2007b) in mind, the political context of Lao PDR raises questions of successful transfer of IWRM principles and policies to the country.

As Ostrom (2002) states external authorities, like national governments, can do a lot to support the likelihood and performance of self-governing institutions. However, their actions can also seriously hinder these developments (Ostrom, 2002, 1329). In Lao PDR the decentralisation process and participatory practices have a “top-down” design and remain themselves government controlled actions where the actual power never leaves the top-level (see e.g. Poppe, 2004). Government is actually not devolved to the lower levels with bottom-up consolidating of the existing status quo. Stuart-Fox (2005, 23) states that “Decentralization is seen by the Party as a means of increasing, not reducing, its power at the local level (...) District officials are like provincial governors, Party members representing Party interests rather than those of local communities. In theory, each level of the party, from the bottom up, elects delegates to the next higher level, but in practice those controlling the higher level co-opt the delegates they choose. As no multi-party system operates in the Lao PDR and there is no polling of public opinion, it is impossible to know to what extent the current system articulates and aggregates the social interests of the Lao people or whether they desire, let alone consent to, democratic norms and procedures.” Also poverty, poor infrastructure, lack of education, gender and ethnic discrimination as well as hierarchal traditions hinder participation in the country (Environmental Research Institute [STEA], 2001; UNDP, 2007). Due to the political culture and context of the Lao PDR, the implementation of IWRM and its core elements is facing difficulties and constraints which need to be taken notice of.

It is necessary to ponder the extent to which the IWRM approach, while a government-controlled and a given paradigm, supports the national development objectives of the Government and more particularly the increasing amount of

hydropower by placing water management *subordinate* to the development of the energy sector. The Government may even use IWRM as a way to legitimise its agenda and action. Conversion of government controlled and built paradigms may not always be the best possible option to be implemented at local levels where the variety of local context and circumstances can vary to a great extent. The process of Irrigation Management Transfer (IMT) where the operation and maintenance of irrigation schemes are transferred from the government to the farmers highlights some problems related to this issue. In addition, decentralisation of water governance from top to the lower levels is problematic. As for the very weak civil society of Lao PDR, it is not facilitating the progress of implementing IWRM. As the Articles reveal, defective and non-democratic governance of Lao PDR can be seen a challenging seedbed for IWRM implementation.

Research framework issues

The research's framework of interpretation is attached to a wider discussion about water management transitions and integrated water management approaches. It begins with the assumption that the IWRM and the elements of integration, decentralisation, and participation (GWP, 2004; Xie, 2006) can enhance the development and implementation of sustainable and effective water regime which can better respond to uncertainties, challenges, and complexity and to take into account all water users' needs. These principles are analysed in the Laotian water regime at operational, constitutional, and organisational levels. The *operational* level consists of water use in hydropower and irrigation sub-sectors, the *organisational* level equals water resource management, and the *constitutional* level deals with policy and law (Lord & Israel, 1996 in van Hofwegen, 2000, 140; Rogers & Hall, 2003, 21, 21). One reason for the selection of hydropower and irrigation sectors to be the case studies of this research is that the Government of Lao PDR has itself selected these sectors to implement IWRM first.

As Lovell, Mandondo and Moriarty (2002) state, the form of institutional arrangements will be location and resource-specific to some degree. It is therefore interesting to raise decentralisation, participation, and integration as core themes of IWRM in this research as the Laotian social, political and cultural environment provides an interesting and challenging context for implementing IWRM and its core principles.

Decentralisation and participation could be seen as leverage or tools to build IWRM from bottom up. "Values underpinning IWRM stress the promotion of 'appropriate' participation in decision-making, equity in the sharing of benefits

between users, and decentralisation of water management to the lowest appropriate level” (Butterworth et al., 2010, 72). In the Laotian context where water management is implemented from top-down, incorporation of the institutional and social dimensions of IWRM, participation and decentralisation, may facilitate more adaptive forms of water resources management.

Moreover, as the FREPLA2020 project used adaptive foresight techniques involving participatory processes, it also gave more impetus to choose participation as one of the ‘core’ themes of IWRM and this research. Hirsch et al. (2010) in Von Korff, Daniell, Moellenkamp, Bots, and Bijlsma (2012) show that “participation can contribute to an improved system understanding and, arguably, learning among both stakeholders and local researchers and thus to a core component of adaptive management.”

The institutional structure governing water resources needs to be changed to reflect the principles of participation and decentralisation. According to Butterworth et al. (2010) “common criticism of IWRM is that it is not people-centred enough and IWRM reforms have tended to focus on the higher levels of scale, on policy and legislation reforms at national level and the establishment of river basin organisations. There remains a need for better mechanisms through which stakeholders can articulate their needs and interests” (Butterworth et al., 2010, 72, 73). Therefore the author sees that is important to raise decentralisation and participation to the leading themes of the research.

As Article IV highlights, decentralisation or devolution of authority on irrigation schemes to Water User Groups and ‘meaningful’ participation are vital issues for the successful implementation of IMT. Article II also accentuates the importance of decentralisation in the form of implementation of River Basin Committees at the river basin level. Participation and decentralisation are important for the management of common pool resources as is shown in Article IV.

Institutional set-up for IWRM requires integration, which is one of the core IWRM principles chosen in this research. Horizontal coordination is very challenging in the Laotian context as decision-making is highly centralised. Article II has shown that the IWRM principle of integration is crucial for successful IWRM. Different administrative levels from local to ministerial level need to be coordinated and linked with each other. This is a big challenge for sustainable management of Laotian water resources and for the whole natural resources management. Articles I and II have shown that one of the biggest hindrances to this is low capacity of administration, especially at the lower levels.

Results of the research, reported in the four articles, are interpreted through the quite recently developed Management and Transition Framework (MTF) and the

Institutional Analysis and Development (IAD) Framework, which is a component of MTF. MTF can provide an enhanced framework to analysing water resources management processes and multi-level governance regimes. “The framework is an interdisciplinary methodological and conceptual tool that supports shifting understanding of water systems, management regimes, and transition processes towards more integrated and adaptive management” (Pahl-Wostl, Holtz, Kastens & Knieper, 2010, 572; see also Pahl-Wostl et al., 2007a). “The MTF builds on and integrates a range of concepts regarding institutional analysis (IAD) (Ostrom, 2005), adaptive management (Pahl-Wostl, 2007b; Pahl-Wostl et al., 2007b), as well as social learning and governance (Pahl-Wostl, 2009; Pahl-Wostl et al., 2007b) to develop a more coherent understanding of the complexity of water management regimes” (in Pahl-Wostl, Holtz, Kastens & Knieper, 2010, 572). Pahl-Wostl et al. (2010, 573; 2007a, 6) define adaptive management as a systematic process for improving management policies and practices by systemic learning from the outcomes of implemented management strategies and by taking into account changes in external factors in a pro-active manner. “In comparison to the IAD framework (developed by Ostrom), the MTF focuses not so much on institutions by giving equal emphasis to actors” (Pahl-Wostl et al., 2010, 574).

“The Institutional Analysis and Development (IAD) framework is a multi-tier conceptual map and is simplified to focus on the Action Situation leading to interactions and outcomes” (Ostrom, 2011, 9). The key part of the framework is identifying an action situation (AS) and the resulting patterns of interactions and outcomes, and evaluating these outcomes (see right part of Figure 2). As stated above, the problem could be at an operational tier where actors interact in light of the incentives they face to generate outcomes directly in the world. The problem could also be at a policy (or collective-choice) tier where decision makers repeatedly have to make policy decisions within the constraints of a set of collective-choice rules. The policy decisions affect the structure of situations. The problem could also be at a constitutional tier where decisions are made about who is eligible to participate in policymaking and about the rules that will be used to undertake policymaking. The first step in analysing a problem is thus to identify a conceptual unit – called “an Action Situation – that can be utilised to describe, analyse, predict, and explain behaviour within institutional arrangements”. (Ostrom, 2011, 9–11).

“According to the Institutional Analysis and Development (IAD) framework⁵ (see Figure 2) important attributes of action situation are its type (constitutional, collective choice, or operational), its phase which refers to different pre-defined stages in policy

⁵ For more information on IAD, see for example Polski & Ostrom, (1999). An Institutional Framework for Policy Analysis and Design. “<http://mason.gmu.edu/~mpolski/documents/PolskiOstromIAD.pdf>”

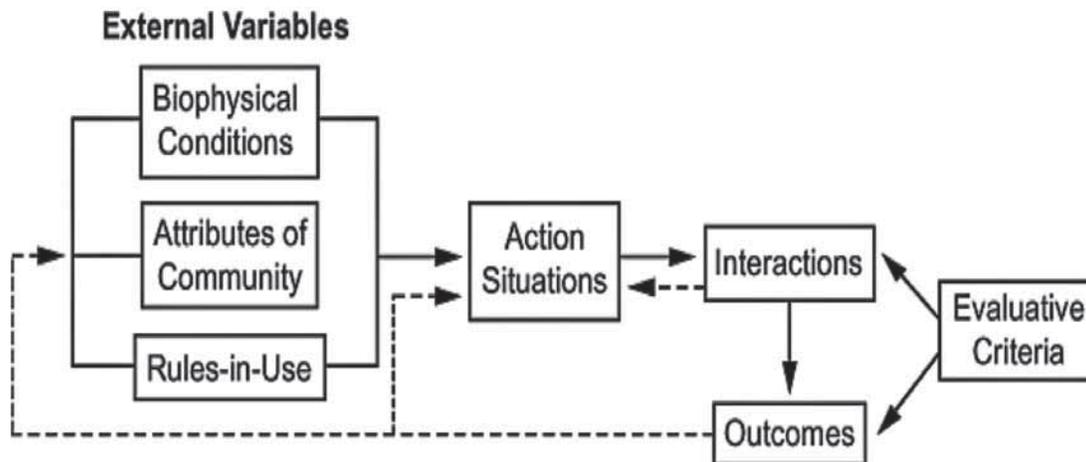


Figure 2: A Framework for Institutional Analysis (Source: Adapted from Ostrom (2005, 15) in Ostrom (2011, 10))

processes (e.g. policy formulation) or learning processes (e.g. building capacity and broadening stakeholder support), its level which refers to different administrative spatial units which could be based on the traditional boundaries of administrations (e.g. national, river basin, province) or those defined by the hydrological principle (e.g. transboundary or national basin, sub-basin).” (Pahl-Wostl et al., 2010, 576; see Schüter, Hirsch & Pahl-Wostl, 2010, 624.).

“Policy processes are represented in the MTF as sequences or networks of Action Situations (ASs) (sensu Ostrom, 2005)” (Schlüter, Hirsch & Pahl-Wostl 2010, 624). “Action situations are the social spaces where individuals interact, exchange goods and services, solve problems, dominate one another, or fight (among the many things that individuals do in action situations)” (Ostrom, 2011, 11). AS is a structured social interaction context that leads to specific outcomes. Such outcomes can be institutions or knowledge which affects social interactions in other ASs or operational outcomes which are direct interventions in the system and affect the water system at large. Operational outcomes may be direct physical interventions such as the implementation of infrastructure or the distribution of water to different uses. They may also refer to changes in societal characteristics such as increased societal awareness for flood problems. Action Situation is the regime element where actors take roles which entitle them to perform certain actions. Also, knowledge is used in an action situation. Action situations are the main link to the process view. (Pahl-Wostl et al., 2010, 576.)

A presentation of the process of Laotian water governance reform – development and implementation of IWRM – can be developed as a multi-level representation using Action Situations (AS). Action Situations are quite widely interpreted in this

research. IWRM policy is developed and shaped at the national level and so are institutional, legal, and regulatory frameworks. Action Situations are analysed in Article II. Action situations at the lower levels (at the basin and community/village level) mainly refer to the operational activities of policy implementation. The policies analysed in the research are decentralisation, integration, and participation.

At the river basin level, River Basin Committees are to be established along with local units of Ministry of Natural Resources and Environment (MONRE) (former Water Resources and Environment Administration), which are analysed in Article II. At the local (community/village) level, AS refers to the transfer of irrigation management (IMT) from state to farmers' associations and groups (analysed in Article IV). IMT can be seen to represent an approach to participatory and bottom-up initiative and the operational outcome of this AS is the establishment of Water User Groups (WUGs) and Water User Associations (WUAs). At the regional (Mekong river basin) level the AS refers to policy implementation related to regional safeguard and IWRM policies which are discussed in Articles I and III. Also the role of actors involved in these processes is discussed and other factors (knowledge, institutions, operational outcomes) influencing an AS are analysed. Article II presents and discusses the major actors involved and their roles in the water reform processes (IWRM).

This research tests an assumption that the MTF framework and the IAD approach can provide a general and conceptual water management framework for analysing IWRM. This study suggests that the use of these frameworks can facilitate an analysis of horizontal and vertical integration and the role of actors and participation in the IWRM process. The application of MTF is to contribute to analysing of the role of different levels and their interaction.

The research and the articles on which it is based are closely attached to the discussion about common-property institutions and their importance to appropriate and sustainable natural resource management/common pool resources (CPR) management (especially Article IV dealing with irrigation management transfer). "Common-pool resources are systems that generate finite quantities of resource units so that one person's use subtracts from the quantity of resource units available to others" (Ostrom, Gardner & Walker, 1994 in Ostrom, 2002, 1317). Irrigation systems are among the most important types of common-pool resources (Ostrom, 1992). In the conventional theory regarding The Tragedy of the Commons, participants do not undertake efforts to design their own governance arrangements. "Substantial empirical evidence exists, however, that many common-pool resources are self-governed" (Ostrom, 2002, 1317).

Effectiveness and compliance of the water management regime can be increased by involving actors in the design of the rules under which they have to operate (Ostrom, 1990). The findings from common pool resources case studies and design principles show that the CPR institutions with high levels of performance clearly demarcate who has the right to use the resource; have themselves crafted rules that are considered fair and well-matched to local physical, biological, and cultural circumstances; and have invested in monitoring and sanctioning (Ostrom, 1994, 13). Ostrom (1992; 1994, 25) stresses that when considering bottom-up coping strategies in a complex and changing context and environment, it is of paramount importance to enhance the capabilities of those who are directly concerned with the particulars of a local situation to organise themselves in enterprises. Their success in taking care of externalities is potentially better than that of any idealised institutional arrangements considered otherwise as the optimal way of solving resource problems. Article IV related to irrigation schemes and their management transfer supports Ostrom's conclusion also in the Laotian context.

What makes Lao PDR a special case

The author's articles and the process of writing this compendium have revealed the need for further research on the meaning and importance of the contextual circumstances when implementing institutional reforms/policies like IWRM. This need has, in its own part, led to the selection of the research methods described above – the Management and Transition Framework (MTF), Institutional Analysis and Development (IAD) approach, and Common Property Resources (CPR) approach. This knowledge gap calls for more in depth exploration of Action Situations and actions in the field of Laotian water regime at different levels (Article II). MTF, IAD, and CPR enlighten these issues especially in the case of irrigation management (Article IV).

The context of Lao PDR is special as the country is one of the very few communist states in the world and presents very strict authoritarian regime with one-party rule. Through the monolithic system, the country prohibits nearly all forms of civil society. Participation is accepted at least in theory in Lao PDR. However, participation of local administrative levels and people is very restricted. The Government does not allow channels or avenues providing and presenting the local level knowledge, needs, and views to influence on or to be incorporated into decision-making. Constraints on public participation in the context of Lao PDR prohibit the people at local level benefitting from new institutional arrangements (WUGs) as was shown in Article IV. The Article also shows lack of local solutions based on unique local contexts.

The Lao People's Revolutionary Party stifles all avenues of dissent, including the media, public protest, and all forms of association not dominated by the party (Bertelsmann Transformation Index Institute, 2006, 1). Very recent incidents⁶ of the expelling of Anne-Sophie Gindroz, the country director for Helvetas Swiss Intercooperation, and the suspected abduction of a highly respected Lao Civil Society Organisation figure Sombath Somphone shows the Party's tightening grip on civil society and media. According to Creak & Barney (2012) "these developments suggest the country's continued emergence as a member of the regional and international community is being accompanied by challenges to the ruling party's tight control over political discourse. Unbothered by mounting negative press coverage abroad, the response by Lao authorities to such events has been to shut down dissent through sanction, harassment, and dismissal." These negative developments may risk the country's current development trajectory, damaging the emerging civil society and its positive international acceptance.

The aim is to understand how the Laotian institutional system applies the IWRM approach in its water regime and how the attributes of the system and the context adapt the IWRM paradigm and its core principles of participation, decentralisation, and integration. The aim of the research is not to explore the transferability of the Laotian system but to better understand how the IWRM fits into the operation and functioning of the institutional model/structure of the country.

True consensus about policies and reforms is lacking as the Party solely holds the decision-making power and there are no avenues for open discussion and knowledge sharing. As the Lao Government does not allow influence from the outside and is not communicating with other avenues of knowledge, it has to trust that there is a need for the IWRM paradigm and that it is eligible and suitable in the context of the country's water regime. It is interesting to analyse how the state system itself can mastermind water development and management and the adoption of IWRM as there are no tools to analyse the reality as contextual local level information and knowledge of civil society are lacking. Therefore, it is the top leaders who must be convinced of the need for reform (IWRM) – or those who are likely to become the top leaders (Stuart-Fox, 2005, 53).

⁶ More information on recent developments available e.g: Creak, S. & Barney, K. (2012). Distressing developments in Laos. <http://asiapacific.anu.edu.au/newmandala/2012/12/23/distressing-developments-in-laos/>

1.2 Objectives

The overall aim of the research is to analyse the application of the integrated water resources management (IWRM) approach and related principles in the development and management of water resources in Lao PDR. Through the four articles it has been analysed how the concept of IWRM, which is predominantly a top-down given institutional change and the elements of integration, decentralisation, and participation, are implemented in water use sectors of hydropower and irrigation at the constitutional, organisational, and operational levels in Lao PDR.

One of the objectives of this research is to describe and analyse the institutional and legal frameworks of Lao water resources management and to identify IWRM principles and approaches. The study aims to enhance understanding of the structural and procedural characteristics of the Laotian water management regime that constitute an arena for implementation of IWRM. According to Philip et al. (2008, 1) “governance institutions, frameworks, legislation and policy at different levels form the structure within which IWRM must operate. If governance is flawed, the opportunities to apply IWRM principles become restricted.” As Dovers (2001, 215) argues, a lack of progress towards sustainable resource management is widely ascribed to institutional inadequacy and failure.

As institutions are of prime importance in the implementation of IWRM, one important aim of the research is to discuss the application and practicability of IWRM to water resources management at organisational and constitutional levels, including practicability of such application to the formulation of policies and strategies of water resources management in the particular context of Lao PDR. Given the increasing development of water resources in Lao PDR and the whole Mekong area, water-related policies and plans as well as participation constitute important research areas. One core topic of the research is to analyse whether the current institutional arrangements and management approaches present an enabling environment for the implementation of Integrated Water Resources Management in Lao PDR.

When interpreting the research results of Articles I-IV, one of the research objectives is to test the feasibility of the MTF approach as an analysis framework. The aim is to experiment the potential of the MTF framework and the IAD approach to explore processes, institutions, and actors related to water governance reforms, including the adoption of IWRM paradigm, and to explore whether it can enhance systems thinking/perspective and increase understanding of the strengths and weaknesses related to different institutional contexts and levels in Laotian water management. The aim is also to learn whether the application of the MTF approach

in this research could reveal some fresh aspects unnoticed in conventional IWRM research.

The transition process towards more sustainable and integrated water management has begun in Lao PDR. The Government of Lao PDR has started to foster the adoption of IWRM approach at an operational level by focusing on key areas in agriculture and hydropower to optimise the water resources (ADB, 2004b, 2). The relevance of the IWRM principles to water management at operational level is studied at water use sectors of hydropower and irrigation. The aim is to evaluate the effectiveness and usefulness of the IWRM approach and elements of decentralisation, participation and integration in improving processes and practices used for water resources management in these sectors in Lao PDR.

Challenges and problems concerning IWRM implementation, such as lack of human and financial resources, incomplete information, institutional fragmentation, lack of proper coordination of management, and weak public involvement, will be discussed in the final Chapter of the dissertation. Lastly, key findings and some key actions and recommendations to promote sustainable and effective water management and to assist implementation of relevant IWRM principles in water resources development and management in Lao PDR are discussed. The research is intended to pave way for further research on water governance in Lao PDR and in the whole Mekong region and it can act as a driver to integrate sustainable development considerations into water development and planning.

1.3 Structure of the Research

The research consist of four separate published academic articles and this introductory overview summing up the objectives, methodologies, and the water resources management context of Lao PDR along with conceptual issues. This compendium discusses and analyses the implementation of IWRM and related principles at different functional levels based on case studies (articles) and analyses challenges and problems concerning IWRM implementation along with lessons learned and future/recommended actions. The writing of the compendium has been more or less similar to the process of writing the Articles as it constitutes a separate research effort. The exploratory approach of the compendium enables to reveal the bigger picture – the wide context of Laotian socio-economic, natural, and political environment to increase understanding of the research topic at hand. This research aims to increase understanding on how the mechanisms of governance and institutions are functioning and policies and reforms implemented.

Chapter One provides background and general framework to the subject at hand and presents the research objectives. Chapter Two highlights the research process and methodological issues. Management and Transition Framework (MTF), Institutional Analysis and Development (IAD) approach and Common Property Resources (CPR) framework are the methodological tools used.

Chapter Three presents information on socio-economic development as well as on water development and management issues in Lao PDR. It presents the status of water resources and describes existing laws, policies, and management organisations related to water management in the country. It also discusses issues of regional water resources planning, development, and management in the context of Lower Mekong Basin region, the Mekong River basin covering nearly 90 percent of the total area of the country (Kemper, Dinar & Blomqvist, 2005, 26). “An estimated 35 percent of all water in the Mekong River originates from watersheds within Lao PDR” (United Nations Environment Programme [UNEP], Regional Resource Centre for Asia and the Pacific, Norwegian Agency for Development Cooperation & Lao People’s Democratic Republic Science Technology and Environment Agency [STEA], 2001, 42). Conceptual issues like the internationally used IWRM definitions and the key characteristics of the concept are discussed in Chapter Four. Chapter Four also presents other water resources management dimensions and levels which can be integrated.

The four articles and their findings related to IWRM implementation are discussed and analysed in Chapter Five. It is examined how integrated water resources management (IWRM) approach and commonly accepted principles of integration, decentralisation, and participation (GWP, 2004; Xie, 2006) are implemented in the context of water resources development and management at different functional levels in Lao PDR. Levels analysed are *operational* – water use level, *organisational* – water resource management level, and *constitutional* – water policy and law level (Lord & Israel, 1996 in van Hofwegen, 2000, 140; Rogers & Hall, 2003, 21, 21). In addition, gaps and challenges related to effective and sustainable water resources management and IWRM implementation are analysed.

Chapter Six provides key findings of the research and discusses the lessons learned. It also makes some policy recommendations for pursuing more effective and sustainable water governance and appropriate IWRM approaches in the face of lagging circumstances such as lack of human and financial resources, incomplete information, institutional fragmentation, and weak public involvement, to name some of the key impediments to realising full IWRM in Lao PDR. Figure 3 illustrates the design pattern of this research.

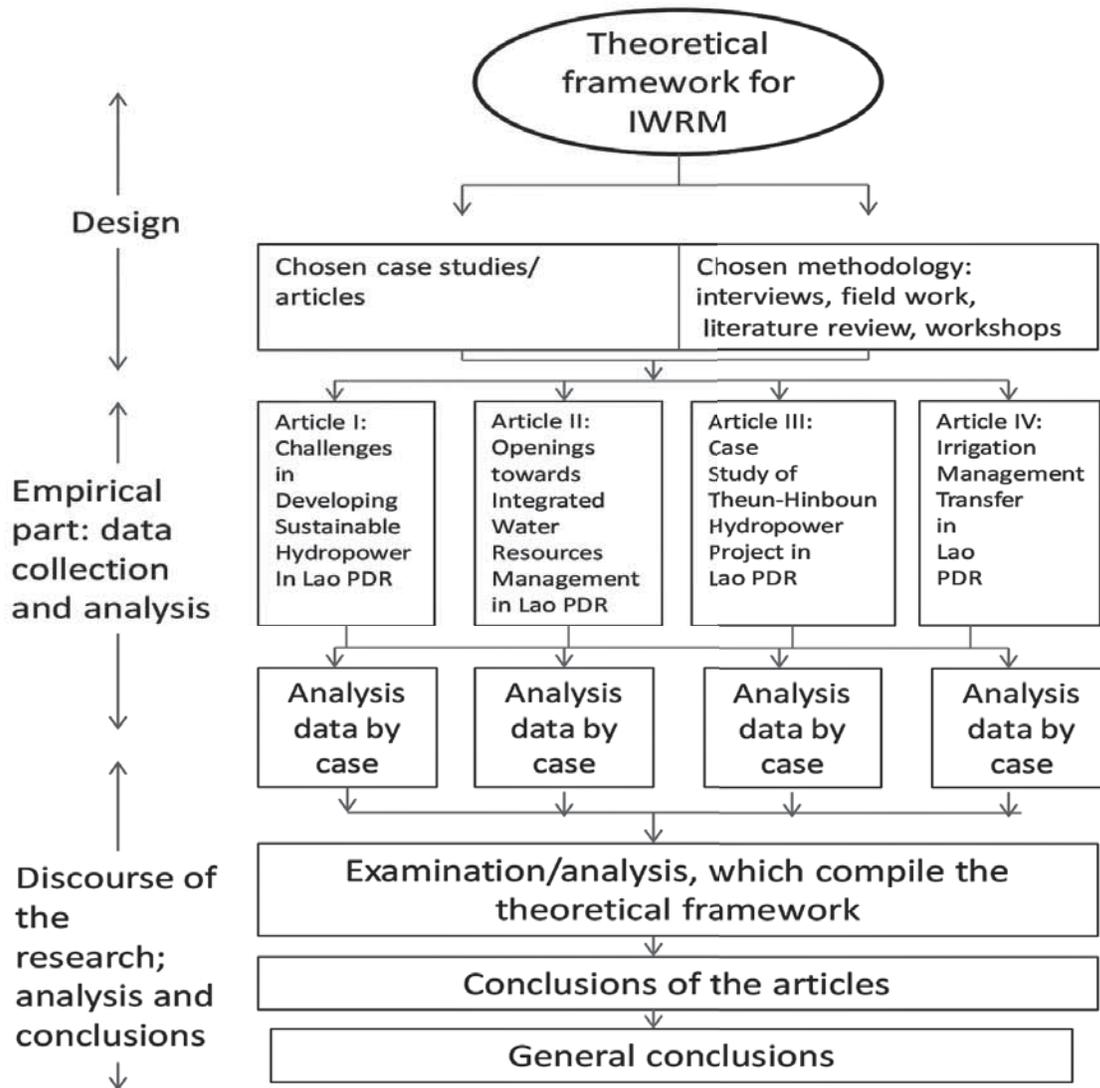


Figure 3: Research Design Pattern (modified from Arhio 2007, 26 and Yin, 1991, 56)

2 Research Process

2.1 On Research Methods

The research, institutional and policy analyses are based on analysing primary data and information; official Government and legal documents and relevant literature, a series of high-level workshops of the Future Resource and Economy Policies in Laos till 2020 project (FREPLA2020). Furthermore, dozens of key-informant interviews with Government officials and experts, project officials, NGOs, donors, and other stakeholders were completed over the years 2004, 2009–2010. Table 1 lists organisations and projects visited and interviewed during the field work periods at different times. Information and data obtained from these interviews and field visits were utilised and reported in Articles I–IV. The informants represented a range of sectors, perspectives, and interests pertinent to governance, water governance in Lao PDR in particular, and to the article topics (irrigation and hydropower). Nearly all of the interviews were tape-recorded with the approval of the interviewees. Also several informal discussions with people working in different development and research projects in Lao PDR have increased the understanding and knowledge on Laotian operating environment and issues related to natural resources development and management. There were no pre-structured interview forms as each interview needed quite specific questions for a particular organisation and for particular issues.

FREPLA2020 project of Finland Futures Research Centre under University of Turku is funded by the Academy of Finland (2008–2011) and implemented together with the Ministry of Energy of Mines and National University of Laos. Also data (interviews, field visits) gathered during the “In-Balance” Project (Governing the Development/Environment Problematique: Institutions Balancing between Local Needs and Global Requirements) financed by the Academy of Finland (2002–2004) is used for the doctoral thesis. Several field visits (see Table 1) to different development projects in the hydropower and irrigation sectors have been conducted during these projects. Secondary data have been collected from various international,

Governmental, and local organisations as well as from published journal articles, reports, books, and documents. Information used for this research is both qualitative and quantitative.

FREPLA2020 high-level workshops the author participated and organised together with the FREPLA team were:

- High-level Seminar of FREPLA2020. Ministry of Energy and Mines (MEM) and Finland Futures Research Centre, 27 August 2010, Vientiane,
- FREPLA2020 Project Expert Workshop III. Ministry of Energy and Mines (MEM) and Finland Futures Research Centre, 10–11 March 2010, Thakhek,
- FREPLA2020 Project Expert Workshop II. Ministry of Energy and Mines (MEM) and Finland Futures Research Centre, 29–30 September 2009, Luang Prabang, and
- FREPLA2020 Project Expert Workshop I. Ministry of Energy and Mines (MEM) and Finland Futures Research Centre, 3 June 2009, Vientiane.

In addition the project organised one more workshop in which the author was not able to participate due to maternity leave.

- FREPLA2020 Seminar. Ministry of Energy and Mines (MEM) and Finland Futures Research Centre, 26–27 May 2011, Vientiane.

The author has worked as a researcher and consultant in many Asian and Pacific countries for a nearly a decade. Knowledge on different actors working at different levels from local to international and different policy processes has increased during these assignments. These years have created quite an extensive network of local, regional, and international actors who have facilitated the research greatly. Because the research is based on the author's published articles with strong contextualisation, the big challenge was how to find a coherent storyline which combines all the articles together. Understanding the context it is important to fully comprehend the phenomena. Context described in the Introduction Chapter has provided a theoretical perspective which gives shape to the research, both to data gathering and analysis and to theorising on organisational change and reform in Laotian water management.

Table 1: Field Work during the Research Process

Country/area	Time	Organisations/projects interviewed/visited
Thailand: Bangkok	02–03/2004	Embassy of Finland in Bangkok, Focus on Global South, EGAT, Midas Agronomies Co
Lao PDR: Vientiane, Theun-Hinboun dam area in Borikhamxay Province,		UNIDO Theun-Hinboun Power Company, ADB, WB, STEA, EdL, NUOL, FAO, IUCN, Environmental Management Unit of the Theun-Hinboun, Nordic Hydropower AB, LNMC, UNDP, Care International, Lao Women's Union, Norplan, MEM (Hydropower office, Department of Electricity), Committee for Planning and Cooperation, ECOLAO; World Concern, TERRA
Philippines: Manila		Headquarters of ADB (Mekong Department)
Lao PDR: Vientiane, field work in KM6/DIDM/CMI project areas in Vientiane, Bolikhamxay, Vang Vieng, visit to Nam Ngum dam area	10–11/2004	MRC, ADB, different departments of MAF (DOI, Department of Planning, NNRBDS Office), WWRC, KMC6, CMI and DIDM Project offices, Gender Resource Information and Development Centre of LWU, several WUGs in Bolikhamxay and Vang Vieng
Lao PDR: Vientiane	03/2009	FREPLA Workshop, EdL, MRC, WREA, MEM
Lao PDR: Vientiane, Luang Prabang	10/2009	FREPLA Workshop, MRC, MEM
Lao PDR: Vientiane, Nakai in Khammouane Province	03/2010	FREPLA Workshop in Nakai, field visit to NTII, WREA, MEM
Lao PDR: Vientiane	08/2010	FREPLA Workshop MEM (department of Electricity, Department of Mining), Ministry of Planning and Investment, WREA, Ministry of Industry and Commerce, Ministry of Finance

“Case study approach attempts to examine a contemporary phenomenon in its real life context” (Yin, 1981, 59) and can be seen as “a research product, a format for reporting qualitative descriptive work” (Wolcott, 1992, 36). The case study approach used in this research is an empirical inquiry that investigates a contemporary phenomenon – Laotian water regime/management system – within its real life context using multiple sources of evidence (Beeton, 2005, 42) described above (primary and secondary data). The use of case study methodology in the thesis is useful as the final aim is to understand the field of water resources management deeply and holistically. It can also provide a panoramic picture since many sources of evidence are used. “A particular strength of case study lies in its holistic inductive nature and grounding in actuality with an insider’s perspective, which is pertinent to areas of policy development and examination” (Ibid, 40). In an intensive case study,

the objective is to provide a thick description, interpretation, and understanding of a unique and therefore theoretically interesting case (Eriksson & Koistinen, 2005).

The case study approach has provided a tool to understand the research subject – IWRM in Laotian water regime – as an entity which is a complex process and involves different views and societal processes. It can produce detailed knowledge on different actors, processes, and developments. (Häikiö & Niemenmaa, 2007, 42, 43, 46.) As Donmoyer (2000, 51–63 in Leino, 2007, 216) states, the case study approach can provide new viewpoints and manner of approaches to a certain phenomenon. In the case study approach, the operational environment is accentuated and the phenomena are perceived in their political, economic, social, and cultural environment (Häkli 1999, 141 in Laine, Bamberg & Jokinen, 2007, 46). Extensive field work in Lao PDR has provided a basis for the research and increased understanding of the Laotian political, social, cultural, and economic environment. According to Flyvberg (2001 in Leino, 2007) the aim of the case study is not to prove one ‘truth’ but rather to learn something new about the research object/phenomenon. Case study approach emphasises the importance of researching special and critical cases when the analysis focuses on strategically important details. (Flyvberg, 2001, 71–73, 77 in Leino, 2007, 218, 219).

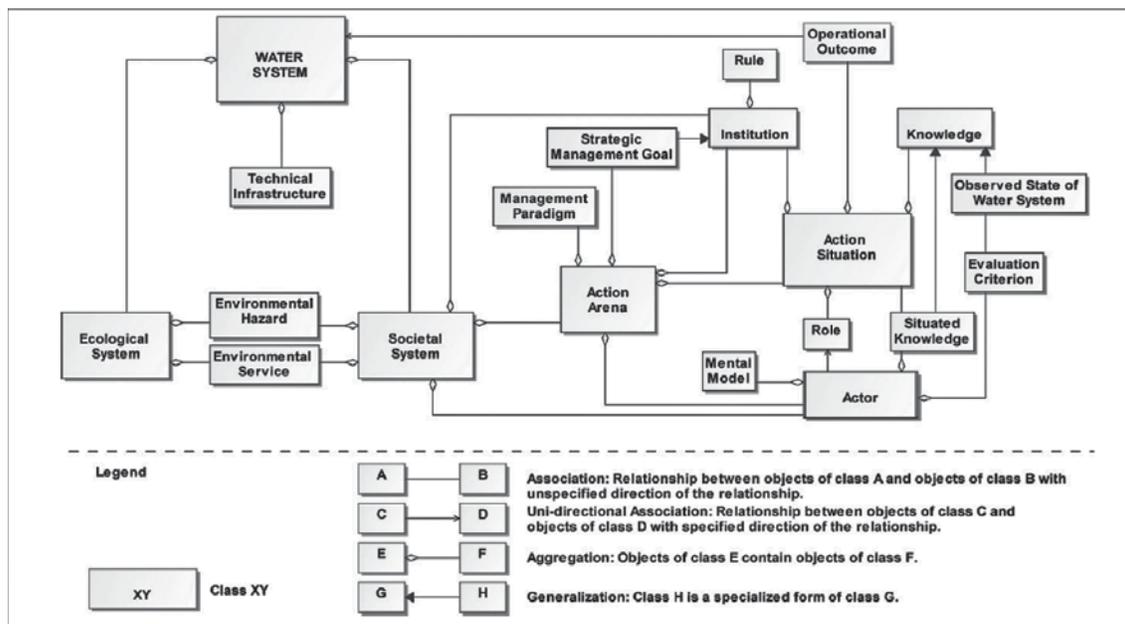
This research and the used case study approach enable analytical generalisation to similar kinds of environments. Yin (2003, 31–33 in Laine, Bamberg & Jokinen, 2007, 29) states that the objective of the case study approach is analytical generalisation which either reinforces or questions a theoretical view previously introduced or self-developed. Häikiö and Niemenmaa (2007) see that research rising from a case or societal practices is primarily research of process dynamics. “Cases themselves cannot be generalised but they can provide tools to understand different phenomena in other operational environments” (Häikiö & Niemenmaa, 2007, 49). A case can be unique, as is the Laotian case, “but the aim is not to describe the uniqueness for its own sake but to rather understand the phenomena through dialogue between unique attributes and their context” (Peltola, 2007, 112).

Applying the Management and Transition Framework (MTF) in the research aims to identify structural and procedural characteristics and processes of change in Laotian water regime. MTF can help understand multi-level governance structures by taking complexity into account in a systematic fashion (Pahl-Wostl et al., 2010, 579). The framework is developed under the EC-supported NeWater project⁷ that aimed to understand and facilitate change towards adaptive strategies for Integrated Water Resources Management (IWRM). The MTF framework emphasises the context

⁷ For more information about the NeWater project available at: <http://www.newater.info/>

dependence and complexity of the research. The strength of the framework is that it links several frameworks based on the integration of conceptual approaches. On the negative side, it has been argued that it is an architecturally highly complicated representation of the transition management process, complex and difficult to understand – designed for transition experts. (Duffy & Jefferies, 2011, 12, 46.)

MTF can offer a way to analyse existing Laotian water governance and management arrangements to evaluate IWRM policy outcomes and possibly to design more successful IWRM policy solutions and raise issues which need further development. Moreover, the IAD framework which can be considered one of the cornerstones of the MTF framework (Pahl-Wostl et al., 2007a) can be useful for analysing the institutional arrangements associated with implementing the IWRM paradigm. It draws attention to the Action Situations and to wide institutional settings including policies, roles, actors, and their interactions. It also pays attention to the contextual conditions of water regime and surrounding socio-political environment (including physical, social, economical, cultural characteristics). (Pahl-Wostl et al., 2007a.)



“Attributes of the classes are not shown to simplify the representation. Regarding links an arrow denotes a generalisation (‘is a’ link – e.g. observed state of water system is a kind of knowledge), an open diamond denotes an aggregation (‘has a’ link – e.g. an actor has a mental model) and a simple line denotes an association without specific kind”. (Pahl-Wostl et al., 2010, 575.)

Figure 4: Simplified MTF Class Diagram (Pahl-Wostl et al., 2010, 575)

The MTF Class Diagram above defines classes of elements of the water system, specifies their attributes, and identifies their relations that have been identified as important to describe water management systems.

2.2 Some Research Issues and Problems Related to the Laotian Context

The institutional environment for the natural resource management of the Lao government is characterised by a lack of effective institutions, human and technical resources, laws and processes to manage its natural resources in a sustainable way, all of which were highlighted in almost every interview held with different actors in Lao PDR. Another characteristic of the authorities is that they do not make the decisions; they mainly receive them passively from the top-level (see Stuart-Fox, 2005, 12, 13). “Due to the cultural hierarchic concepts, people do not usually express their opinions “too much” (Ostberg, 2008, 36). So the political culture needs to be taken carefully into account when conducting research and designing the interview questions and project workshops and seminars. It was important to explain and clarify the aims of the research or project (preferably in the form of an official letter signed by the Project Director or high-level staff working at the University of Tampere) and to emphasise the confidentiality of the interviews as some topics may have been sensitive.

On the other hand, with applying the Adaptive Foresight⁸ (AF) paradigm in the workshops and seminars of the FREPLA2020 project, foresight has become an increasingly participatory activity including many stakeholders and officials from different ministries. Futures research approaches and methodologies can effectively be utilised in assessing the impacts of policy and institutional reforms (Hukka, Juuti, Katko & Seppälä, 2006, 108). According to Eriksson and Weber (2008) the adaptive planning paradigm can provide a natural starting point for navigating the complex landscape of policy strategies by combining elements from the foresight and adaptive planning traditions. Adaptive planning stresses that foresight needs to go beyond the level of a collective process, down to the level of individual actors’ strategies. AF should be interpreted as a part of a broader continuous learning process that comprises the implementation and evaluation of specific policy measures as well as a monitoring of relevant developments in policy at large. Strategy development,

⁸ For more information on AF: Eriksson & Weber, (2008); European Commission, Joint Research Centre, Online Foresight Guide at: http://forlearn.jrc.ec.europa.eu/guide/2_design/meth_adaptive-foresight.htm

policy design, implementation, and learning should thus not be understood as distinctly separate phases but rather as a continuous process of mutual adjustment. This adjustment refers to goals and objectives, to the identification of new socio-technical options, to the growing knowledge and understanding of their impacts, to the design of new types of policy options, and to their integration into portfolios. (Eriksson & Weber, 2008, 464, 478.)

The use of the AF approach has enabled the Laotian experts and officials to express their insights and opinions more freely and spontaneously and to assist in building a formulation of collective views and visions. The use of AF has inevitably given better and perhaps more exiting research results to the FREPLA2020 project as well as to the thesis itself. It has raised participation to one of the core themes of this research when analysing and studying IWRM implementation in Laotian water regime. It can be stated that the research methods used in FREPLA2020 project have at least to some degree facilitated social learning and adaptive management of participants from different Government ministries. Figure 5 below presents the phases of adaptive foresight process in FREPLA2020 project.

In itself, the environment/political context has hampered field studies and research. However, over the years the research environment has opened up and nowadays international NGOs and academic researchers can do research more unrestricted. Another issue that prohibits research to some extent is the lack of reliable and up-to-date data and information related to water management and planning, natural resources planning/management, and the economy in general.



Figure 5: Phases of Adaptive Foresight Process in FREPLA2020 Project (Source: Project presentation by FFRC Research Director Jari Kaivo-oja, 2009)

In Lao PDR one of the major problems related to planning and management is the lack of information and proper data collection procedures. Planning, management, and development of natural resources are hampered by the lack of up-to-date and consistent databases. In most sectors information is limited, fragmented, and generally of limited reliability. Accurate and reliable data and information on socio-economic issues, meteorology, and hydrology – all essential for environmental management and planning – are available in Lao PDR in a dispersed manner. Other deficiencies that label Laotian data collection are lack of cooperation and information exchange and insufficient funds for data collection. (Boupha, 2000.) Integrated knowledge management systems using modern ICT competences and data banks should be developed in the country.

The author is also aware that it is good to recognise problems related to the use of translators, especially during field studies and interviews at the grass-root/village level. Using an interpreter in an interview situation always leaves a possibility that the message of the interviewee may change due to the translation from Laotian to English. At least a partial solution to this problem is triangulation (see e.g. Jick, 2006) with cross-checking of evidence and findings.



Figure 6: Participants of the FREPLA2020 Workshop III (Thakhek, Lao PDR, 10–11 March, 2010) (photo taken by Sari Jusi, March 2010)

3 Water Development and Management in Lao PDR

3.1 Socio-Economic Development of Lao PDR

Lao People's Democratic Republic is a landlocked country in South-Eastern Asia with an estimated population of 6.3 million people (July 2010) (CIA World Factbook, 2010). Figure 7 shows the map of Lao PDR. The political and institutional environment of Lao PDR is characterised by a centralised government and non-democratic structures. The Laotian administrative system consists of four levels of state administration: central, provincial, district, and village. The current system of government is organised on a centralised pattern with a strongly deconcentrated administration at the provincial level and to a lesser degree at the district level (MRC & GTZ, 2007). The country was dragged into the Vietnam War (1955–1975), with heavy U.S. aerial bombings. History and religion (Buddhism) have affected the country's socio-political structures and institutions. Laotian mass media is run by the state, and freedom of speech and assembly is restricted. (Than & Tan, 1997, 15.)

The UN Development Programme lists Lao PDR as one of the Least Developed Countries (LDC) with an average GDP per capita about 840USD (2009) (ADB, 2009a). The Lao government aims to graduate from the LDC list by 2020. Since the adoption of the New Economic Mechanism and the open-door policy in 1986, considerable progress has been achieved. Economic growth has been quite rapid during the last years, equalling about 7.9 percent real annual growth. (Government of Lao PDR, 2010, 2.) The large inflows of foreign direct investment (FDI) in the hydropower and mining sectors have significantly contributed to this growth. “Out of the 7.8 percent GDP growth in 2009, about 3.3 percentage points came from hydropower, 0.9 percentage points from agriculture, around 0.4 points from mining and construction each, 0.8 percent from manufacturing, and about 1.7 percentage points from the service sector” (Ministry of Agriculture and Forestry [MAF], 2010, VIII). The World Bank (2011) has estimated that the total wealth per capita by

economy was 8,297 US\$ in 2011. Despite high economic growth, Lao PDR stays an agrarian (and dualistic) economy with three-fourths of its workforce still engaged in low productivity subsistence agricultural sectors, whereas the resource-based, market-linked economy has high productivity (UN, 2001, 3).

Transitional economies of the Lower Mekong Basin (LMB) countries of Vietnam, Cambodia and Lao PDR previously followed centrally planned economic systems embarked on market-oriented reforms to support their economic growth in the late 1980s and early 1990s. Vietnam has been certainly the most successful, but all three countries have quickly achieved macroeconomic stability and rapid growth. Since the introduction of doi moi (renovation) economic reforms in 1986, Vietnam's economy has been among the fastest growing economies in the region. In 1986 the Lao PDR abandoned economic communism for capitalism by introducing the New Economic Mechanism (NEM) by moving from a centrally-planned to market oriented economy, the party retaining tight political control. Since the new millennium, Vietnam has gone quite a way towards deepening its reforms. While liberalization has been fairly successful, institution building has been less so. The challenge is for the other two economies to develop and deepen their institutions in order to broaden their export base as well as continue to attract foreign direct investments. (Source: Leung, Thanh & Reat, 2005; Than & Tan, 1997.)

Info Box 1: Transition Economies of the Lower Mekong Basin countries

Existing farming systems are categorised into lowland rain-fed, lowland irrigated, upland rain-fed, highland farming, and plateau farming systems. The area planted to rice represents more than 80 percent of the nation's cropped land. Lao PDR is self-sufficient in rice overall, but localised rice deficits and household food insecurity continue to occur in many parts of the country, particularly in the northern region. (ADB, 2005, 7)

Lao PDR has been successful in reducing poverty. "Poverty incidence has declined from 33 percent in 2002 to around 28 percent in 2008" (ADB, 2009b, 239). The country follows a Five Year Plan system to steer and manage both public and private investments. The Seventh National Socio-Economic Development Plan of Lao PDR (NSEDP) for 2011–15 is planned to outline efforts to achieve Millennium Development Goals and it provides the Government of Lao PDR a framework for both economic and social advancement. The NSEDP is coordinated with the National Budgeting Framework and the National Public Investment Program (Government of the Lao PDR, 2011a). The country aims to combine integration benefits of market economy to its planning economy. Lao PDR has become an active

partner in ASEAN and other regional co-operation initiatives. The country is a member of AFTA (Asean Free Trade Area), where it has to enact the zero tariff rates on imports in 2015 according to the Common Effective Preferential Tariff (CEPT) scheme (ASEAN, 2009). Lao PDR is also taking steps required to join the World Trade Organization, such as reforming import licensing (WTO, 2012).

Vast natural resources have enabled the country to post high growth rates and accelerate poverty reduction efforts, but at the same time new challenges have emerged around sustainability, governance, and equity. The use of natural resources for food and other local demand have also become increasingly important. As rural Lao PDR remains an essentially agrarian society and the livelihoods of its people are underpinned by the presence of the healthy and diverse ecosystems that provide them with sustenance, the issue of sustainability is very important (ADB, 2000a, 44). “Most communities also rely on fuel wood for energy and many on non-timber forest products (NTFPs) for food supply” (WB, 2005, 14).

The question emerged is how to turn the country’s natural resources to social and economic development in an environmentally, socially, and economically sustainable way. New and complex but often unequal development opportunities can bring about natural resource loss and negative dietary change. To achieve its socio-economic objectives, Lao PDR needs to manage its natural resources (agricultural land, forestry and protected areas, minerals, and hydroelectric potential) by implementing proper policies and institutions built to ensure environmental and socio-economic sustainability (see e.g. WB, 2010b). Despite the existence of legislative and other administrative frameworks, weaknesses remain in enforcement and regulatory capacity (EU, 2006, 13). There are still some overlapping jurisdiction and unclear institutional mandates, and the dissemination of law texts is not wide-reaching enough.

Moreover, lack of vertical and horizontal coordination among agencies involved in natural resource use and management coupled with limited human capacity hinders the effectiveness of the institutional environment. The ability to monitor the environment can be imperilled by inadequate transparency and poor accountability. (Bestari, Mongcopa, Samson & Ward, 2006, 8; Callander, 2007, 6; Government of Lao PDR, 2009, 4; MAF, 2010, 11.) These deficiencies limit the country’s ability to strategically manage its own natural resources and to ensure that the rapid development of natural resources based projects occurs in a balanced and socially and environmentally acceptable way (WB, 2010b). Therefore, there is an urgent need for an integrated sustainable policy framework for planning and decision-making on natural resources development, including vital water resources.



Figure 7: The Map of Lao PDR (Source: Map Design Unit of the World Bank, 2004 in World Bank, 2012, 97)

3.2 Status of Water Resources

Lao PDR has rich and varied natural resources of which water is one of the most important and vital for the country's economic development (Government of Lao PDR, 2011b; 2006; 2004). The Mekong River is one of the world's longest and most biodiverse rivers in the world. The Mekong River basin covers nearly 90 percent of the total area of the country (WB, 2005, 26) and an estimated 35 percent of all water in the Mekong River originates from watersheds within Lao PDR (UNEP, Regional Resource Centre for Asia and the Pacific, Norwegian Agency for Development Cooperation & STEA, 2001, 42). "Lao PDR's climate, landscape and land use are the major factors shaping the hydrology of the river" (Mekong River Commission [MRC], 2005, 5). In addition to the Mekong, several smaller river basins drain from Lao PDR towards Vietnam. Lao PDR has estimated (internal) renewable water resources (IRWR) of 57,914 m³/person/year in 2007 (Food and Agriculture Organisation [FAO], 2009). The total renewable water resources are estimated at 333.5 km³/year. In comparison to other Asian countries, Lao PDR has the highest per capita water availability (ibid.).

A small proportion of ground water has been used so far in Lao PDR. The groundwater is the main source of potential rural and small town water supply. (Boulapha, 2005). A study made by the Interim Mekong Committee (1986) observed that the country is divided into two geological areas: the Annamian Strata occupying most of northern and eastern part of the country and the Indosinian sediments mainly along the Mekong (WRCCS, 2005, 70). There are three different aquifer systems:⁹ the Annamian, Indosinian, and the alluvial aquifers (Water Environment Partnership in Asia [WEPA], 2012). Groundwater information including resource potential, usage, and quality is very scant in the country even though it is the main source of rural water supply (WEPA & IGES, 2012, 84; WRCCS, 2005, 70).

The major sub-sectors of water use in Lao PDR are irrigation, hydro-power, navigation, fisheries, and urban and rural water supply (Turner, Pangare & Mather,

⁹ Three different aquifer systems of Lao PDR: 1) the Annamian aquifers occur randomly. These are local systems that discharge locally to the river or its tributaries. As local flow systems, they are not part of the regional flow system and will not carry pollution into the regional groundwater system. The potential water supply from groundwater in the northern part of the country is considerable in view of the high amount of recharge available. Water quality should be reasonably good and for the most part potable but will be iron rich. Yields up to 5 liters/sec can generally be anticipated; 2) the Indosinian group of aquifers, which have regional flow, includes rock of the Indonesian Moyennes and Superieures and is relatively young. They are mostly freshwater sediments, although there are horizons of brackish water, and one major zone of saline water. Yields of 12–24 liters/sec can be developed; 3) the alluvial aquifers associated with the sedimentary deposits of the Mekong River are not rated highly as aquifers. (WEPA, 2012.)

2009, 17). However, little of the available water supply is developed. The total storage capacity of large reservoirs is 7 km³, which is equivalent to 2.8 percent of the annual surface water supply (WEPA, 2009, 21). Water withdrawal for agriculture was approximately 3.96 km³, while for municipalities and industries it was an estimated 0.13 km³ and 0.17 km³ respectively in 2005 (FAO, 2009). WEPA (2012) assesses that agricultural water amounts to 82%, industrial to 10%, and domestic to 8% of total water use in Lao PDR. Some 35 percent of cultivated land has access to irrigation (Government of Lao PDR, 2006) and equipped area for irrigation (in 2000) is 2,960 km² (FAO, 2009). Hydropower production is only at two percent of its potential of 30,000 megawatts.¹⁰

There are increasing conflicts between rural and urban communities as well as between agricultural, industrial, domestic, and environmental use of water. “Serious water shortages and concomitant competition are evident at the local level” (UNEP et al., 2001, 45). Other issues, such as flooding and drought, watershed degradation, and water pollution, do occur but are generally dealt with on a case to case basis. Whilst still within acceptable limits, the quality of both surface water and groundwater are declining according to the National Sustainable Development Strategy (Government of Lao PDR, 2008, 40). With rising populations in urban and upland areas, issues related to water pollution will become increasingly important in the near future. Water quality is still generally good but there is local deterioration in and around urban areas (ADB, 2010c, 3). The Government is currently preparing national ambient water quality standards. The methods adopted for treatment and disposal of wastewater are generally not satisfactory. (WREA, Ministry of Planning and Investment & UNEP, 2008, 39.)

On-site wastewater disposal and treatment facilities, mainly septic tanks, are often poorly designed, constructed, and maintained and therefore perform badly. In addition, discharges from some major industrial and mining establishments are also polluting water sources. A growing number of industries have very limited wastewater treatment systems for reducing waste concentration and load in the final effluents to waterways. (WB, 2005, ix, 34.) Throughout Lao PDR, there is a high incidence of gastrointestinal diseases such as diarrhea and dysentery caused in part by inadequate water supply, poor sanitation and sewerage, poor hygiene, and the absence of wastewater treatment facilities (WB, 2005, 32; WREA, Ministry of Planning and Investment & UNEP, 2008, 39). “With the exception of once-off wastewater data collection carried out in 2002, no regular monitoring exists. The monitoring results of this data collection showed that the average of all parameters

¹⁰ Department of Energy Promotion and Development [EPD], <http://www.poweringprogress.org/>).

(conductivity, pH, alkalinity, BOD⁵, COD, and temperature) were within acceptable limits, although certain samples exceeded standards for Class A wastewater discharge”. (WB, 2005, 34.)

According to meteorological data (ADB, 2010a, 4; Parry, Canziani, Palutikof, van der Linden & Hanson, 2007), Southeast Asia has been increasingly subject to floods and is susceptible to stronger tropical cyclones and storm surges. Extreme weather events are expected to increase in intensity and frequency, causing extensive damage to property, productive assets, human life, and livelihood. Climate change is expected to affect water resources by intensifying floods and droughts in Lao PDR (ADB, 2007a; Global Environment Facility Asia [GEF], WREA & United Nations Development Programme (UNDP), 2009, 57, 58; K. Pholsena, personal communication, August 26, 2010; WREA, Ministry of Planning and Investment & United Nations Development Programme [UNEP], 2008).

Intergovernmental Panel on Climate Change (IPCC) predicts that future climate change is likely to affect agriculture, risk of hunger, and water resource scarcity with enhanced climate variability and more rapid melting of Asian glaciers. Climate change is likely to affect forest expansion and migration, and exacerbate threats to biodiversity resulting from land use/cover change and population pressure in most of Asia. The maximum monthly flow of the Mekong is estimated to increase by 35 to 41 percent in the basin and by 16 to 19 percent in the delta, with the lower value estimated for years 2010 to 2138 and the higher for years 2070 to 2099, compared with 1961 to 1990 levels. In contrast, the minimum monthly flows are estimated to decline by 17 to 24 percent in the basin and 26 to 29 percent in the delta suggesting that there could be increased flooding risks during wet season and an increased possibility of water shortage in dry season. (Cruz et al., 2007, 483.)

Water resources in Lao PDR contribute significantly to the economy through support to irrigated agriculture and growing hydropower revenues (ADB, 2007b, 2). The water resources sector contributes significantly to national goals and policies, particularly in terms of the contribution of irrigation towards agro-industry, food self-sufficiency, and reduction in shifting cultivation. Hydropower contributes to export earnings; and water supply, sanitation and waste water disposal to the quality of life. Urban water supply meets the needs of industry and urban population. Fisheries are a major source of food and contribute to foreign earnings. Navigation improves transportation links, particularly with China, Myanmar, and Thailand. (Pheddara, 2003; Water Resources Coordination Committee Secretariat [WRCCS], 2005, 68–70.)

Lao PDR's hydropower potential is very considerable and it is already a major contributor to economic output, government revenues, and export earnings (UN,

2001). The Government continues to give priority to power sector development to expand electrification in the country and to export electricity to neighbouring countries. The latter would generate revenues which could be used for priority poverty reduction programs. The country has large hydro-power potential with estimates varying from 18,000 MW to 30,000 MW, out of which only 667.5 MW has been developed so far (10 hydropower dams). (EPD, 2009; Government of Lao PDR, 2004.) As part of the five-year Plan, the Government has constructed some major hydro power projects. The Nam Theun 2 Hydropower dam has added another 1,070 MW of capacity. There are also high potential for electricity to be generated in 6 to 8 smaller dams capable of generating 600 to 800 MW (Government of Lao PDR, 2006). The government of Lao PDR has to date signed MOUs or is undertaking research studies on a total of more than 70 hydropower projects (EPD, 2009). The amount of power imported is expected to grow as a result of the rapidly increasing demand and the constraints on power generation. On average 65 to 80 percent of the annually produced energy is exported (WB, 2005).

The development of water resources is also interpreted by the Government as an opportunity to link Lao PDR to the rest of Southeast Asia through the Greater Mekong Sub-Region Program¹¹ (GMS Program) with assistance from the Asian Development Bank. Lao PDR seeks to play its part in the Mekong River Commission (MRC) system.

3.3 Legal and Institutional Framework for Lao Water Governance

The Government of Lao PDR (GOL) has already quite extensive legislative and institutional measures to manage water resources efficiently and effectively. The Lao government adopted an integrated approach to sustainable water resources development in the early 1990s (ADB, 2007b) with the support of international donors. In particular, the Asian Development Bank has funded many activities¹²

¹¹ More information of the Greater Mekong Sub-Region Program available at: <http://www.adb.org/gms/>

¹² Some of the Asian Development Bank funded projects are: ADB, (1998). Technical Assistance to the Lao People's Democratic Republic for Institutional Strengthening of the Water Resources Coordination Committee (TA 3006-LAO). Manila; ADB, (1999). Technical Assistance to the Lao People's Democratic Republic for Implementation of the Water Sector Action Plan (TA 3205-LAO). Manila; ADB, (1997). Technical Assistance for Institutional Strengthening for the Water Resources Coordination Committee. Manila; ADB, (1999). Technical Assistance for Implementation of the Water Sector Action Plan. Manila; ADB, (2002). Report and Recommendation of the President to the Board of Directors on a Proposed Loan to the Lao People's Democratic Republic for the Nam Ngum River Basin Development Sector Project. Manila.

for the introduction of integrated water resources management in the country. The IWRM implementation has faced many constraints including inadequate and fragmented institutional setup, limited technical capacity, inexperience of the agencies concerned in managing water resources, and lack of coordination of agencies involved in the water sector. Shortfalls in funding, inadequate public awareness and participation as well as limited involvement by communities, NGOs, and the private sector, etc. are also some of the key gaps related to IWRM implementation. (ADB, 2007b, 2; S. Komany, personal communication, August 20, 2010; K. Pholsena, personal communication, August 26, 2010; Ti & Facon, 2004, 71–73; WB, 2007.)

The Government introduced a more integrated approach for water resources development and management with the enactment of the Water and Water Resources Law in 1996 (ADB, 2007b, 2). The Law mainly focuses on the protection of water resources, water resource planning, and prevention of water pollution (Turner, Pangare & Mather, 2009, 14). The current Water law states that “water and water resources are the property of the national community whom the State represents in their management, and in the thorough and reasonable allocation of their use to various parties. Individuals, legal entities, or organisations shall have the right to possess and use any natural water and water resource in any activity, provided that they have received approval from relevant authorised agencies, except in the case of small-scale usage as provided by this law.” (Government of Lao PDR, 1996, 2.) Due to weak institutional arrangements, the implementation of the law remained incomplete (ADB, 2007b, 2). The Water and Water Resources Law will be revised to provide MONRE (formerly WREA) with clear legal backing and authority to manage national and river basin-level water resources (WREA, 2010a).

The Water Resources Coordination Committee (WRCC) was established under the Prime Minister’s Office in 1998 (ADB, 2007b, 2). In the past, the WRCC was the national authority and advisory body with a mandate to coordinate the planning, management, protection, and monitoring of water resources. Later the Water Resources and Environment Administration (WREA) was set up to replace the functions of WRCC in 2007. Water Sector Strategy and Action Plan were prepared in 1999, but they were not implemented due to weak regulations and institutional arrangements. Prime Minister’s Decree to implement the Law on Water and Water Resources was approved in 2001. (ADB, 2010c; WRCCS, 2005.) The In-Balance and FREPLA2020 research projects have been implemented and the authors’ articles been published in the same time frame as these institutional changes have taken place and IWRM policies have been developed and implemented in Lao PDR.

Previously water management was fragmented and spread across nine agencies. Part of the water sector reform was the establishment of the Water Resources and

Environment Administration (WREA) in 2007 which was an authority under the Prime Minister's Office. WREA included six departments, namely a Cabinet Office for the Minister, an Environment Department, the Environmental Research Institute, Department of Water Resources (DWR), the Water Resources Institute (WRI), and the Department of Meteorology and Hydrology (DMH). The WRCC and the Lao National Mekong Committee (LNMC) were merged into WREA (ADB, 2007b, 2, 3). The water sector has been quite recently further re-organised by establishing a new ministry – Ministry of Natural Resources and Environment (MONRE) in June, 2011 (WEPA & IGES, 2012, 85) and by merging the Water Resource and Environment Administration with parts of the National Land Management Authority and the Geology Department, as well as the Protection and Conservation Divisions of the Department of Forestry (WREA, 2011).

WREA had a mandate for the management of water resources, environment, meteorology, and hydrology activities throughout the country. The mandate focused on strengthening the national capacity for water resource management and on regulating environmental impacts and water use through development activities. One main task of WREA was to evaluate and supervise the implementation of Environmental Impact Assessment (EIA). It also acted as the focal point for the Government preparing the National Strategy on Climate Change as well as the focal point for coordination with sectoral working groups to deal with climate change. (ADB, 2007b, 3; K. Pholsena, personal communication, August 26, 2010; WREA, 2010a, 7.) These responsibilities are now being transferred to the new Ministry of Natural Resources and Environment.

The new ministry will mainly focus on the management, monitoring, and assessment of resource use and the contribution they make towards poverty reduction and economic growth in the country (WREA, 2011). Responsibility for the delivery of water services for irrigation, domestic water supply, and hydropower remains with the relevant agencies and private sector organisations. “This separation between regulation and service delivery provides a strong platform for improved water governance in Lao PDR and in the wider basin context”. (ADB, 2007b, 3.)

Provincial level water resources and environment offices as well as district and local level units were set up at the same time as WREA was established to take over the environmental functions of the Science, Technology, and Environment Agency, and the data collection operations of the Department of Meteorology and Hydrology. MONRE (formerly WREA) provides technical guidelines to these offices as well as to sectoral and local water resources and environment units. The aim is to delegate the authority for signing Initial Environmental Examination (IEE) certifications to the provincial level and to build the capacity of provincial MONREs (former WREAs)

to do so. “Lao National Mekong Committee is responsible for coordination with Mekong River Commission and for supervising the planning and management of river basins in Lao PDR consistent with the Mekong Agreement and its plans and strategies” (Boulapha & Lyle, 2011, 1).

Up to this time, water resource management in Lao PDR has not comported with the rapid growth of development across the country, despite the Government’s efforts to develop laws and regulations. Weaknesses and gaps exist in the understanding and application of an effective and integrated approach to water resource management. Due to increasing water developments, it is necessary to develop the roles, responsibilities, and capacity of agencies involved in water resource management. Appropriate plans and planning tools are needed to guide both public and private sector investment activities and to balance economic development with protection of the environment, eradication of poverty, and other social development objectives. (WREA, 2010a, 1.) To answer this need, the Government is currently editing the previously updated National Water Resources Policy along with National Water Resources Strategy and Action Plan (ADB, 2010c) funded by an Australian grant through the ADB and representing it to the new Minister of MONRE.

Lao PDR is also developing and planning its seventh National Socio-Economic Development Plan (NSED) for the years 2011–2015. Both the NSED and the National Growth and Poverty Eradication Strategy (NGPES) are central to the national development agenda (see e.g. UNDP, 2007). The goals and plans of these planning documents clearly require support from the water sector, which comprises a number of agencies with resource development and management functions related to water and water resources (WRCCS, 2005, 66).

Ministry of Natural Resources and Environment (formerly WREA) is currently reworking the new National Water Resources Policy. The policy reflects the Government’s direction and decision-making for water resources management by ensuring equity in water access and sharing of water development and benefits of water use for society. The policy aims to contribute to poverty eradication, protection, and restoration of the water environment, and to deal with increased water scarcity. (WREA, 2010a, 2.) The new policy and strategy are set to define agency roles and responsibilities more clearly and to remove any overlap between agency functions. It aims to direct how various ministries, agencies, and local government bodies will work together to achieve a common set of priorities. It indicates general principles for water resource management, objectives for the water sector, priority areas of activity, specific targets to be achieved, and the resources and time schedule to achieve them. (MRC, 2010b, 226; K. Pholsena, personal communication, August 26, 2010; WREA, 2010a.)

National Water Resources Strategy and Action Plan (NWRS) for the Years 2011 to 2015 will be monitored by MONRE (former WREA). It aims to be a broad, long-term, and systematic plan on how the Government's water-related goals and objectives will be achieved. The National Water Resource Strategy and Action Plan is based on nine major policy statements and presents nine corresponding programs which will be implemented to achieve the objectives of the policy (WREA, 2010b, 1). "Moreover, the Government has promulgated the binding approval of the environmental and social impact assessment (ESIA) and the related Compliance Certificate, as part of the concession acquisition process" (WB, 2010a, 10).

The causes of the various natural resource management problems reflect institutional deficiencies such as lack of resources, skills, accountability, and authority in existing organisations and in coordinating arrangements as well as the loopholes in the present policies and regulations (see e.g. WB, 2010a). The institutional environment, including efficient laws and regulations along with enforcement rights, needs to be in place before developing other water planning and management areas. (Government of Lao PDR, 2008, 48; K. Pholsena, personal communication, August 26, 2010.) These deficiencies limit the country's ability to manage its own water resources strategically to ensure that the rapid development of water-related projects occurs in a balanced and socially and environmentally acceptable way. Furthermore, they restrict the country's possibility to be an informed and equal partner in the international negotiations that occur within the Mekong River Commission (MRC) (ADB, 2007b, 2).

3.4 Regional Context – Mekong River Basin

The Mekong River Basin is defined by the land area surrounding all the streams and rivers that flow into the Mekong River. The lower Mekong Basin countries include Lao PDR, Cambodia, Thailand, and Vietnam. Yunnan province of the People's Republic of China and Myanmar also share Mekong River resources. With a total land area of 795,000 km², the Mekong River Basin is nearly the size of France and Germany together. (MRC, 2011a.)

The Mekong ranks the tenth amongst the world's great rivers on the basis of mean annual flow at the mouth. The Greater Mekong can be divided into two parts: the Upper Basin in Tibet and China, and the Lower Mekong Basin (LMB) from Yunnan downstream from China to the South China Sea (MRC, 2005, 1). "The mean annual discharge of the Mekong is approximately 475 km³" (MRC, 2005, 27). About 72 percent of the total population in LMB live in rural areas and most of them are

mainly subsistent farmers whose livelihood, i.e. agriculture, fisheries, and collection from forests, depends on the Mekong and its tributaries (MRC, 2010a, 2).

The Mekong Region is undergoing rapid environmental, economic, and social transitions (see e.g. Varis et al., 2008a). Increasing development of water resources (hydropower, irrigation, navigation) sets enormous challenges to sustainable water management. Within the Mekong Basin, each riparian country perceives its future water-related opportunities and risks in very different ways and has quite different technical and financial capacities (MRC, 2009, 9, 10). Management of the Mekong will increasingly require the riparian countries to address cross-border issues, which in turn will demand strong national capacities to deal with complex water use and resource protection issues. The future may require trade-offs that have been avoided so far due to the relatively limited development of the water resources in the basin. The projected challenges highlight the need for each country to have appropriate policies and capacities for water resource management. (ADB, 2007b, 1.)

The Mekong River Commission (MRC) is an influential country-driven organisation that provides the institutional framework to promote regional cooperation in order to implement the 1995 Agreement on the Cooperation for the Sustainable Development of the Mekong River Basin (MRC, 2011b; MRCS, 2011). “The MRC can play a key role in promoting negotiation and dialogue between administrative units or upstream and downstream countries, particularly where local interventions affect transboundary watersheds and river basins” (Bach et al., 2011, 40). “The MRC sets guidelines and sectoral programs¹³ for different water use sectors. MRC has oriented its work program focus away from individual projects towards an Integrated Water Resource Management (IWRM) approach developed jointly by the cooperating countries” (ADB, 2010c, 2). Chapter 5.1 discusses the IWRM strategy and the Strategic Environmental Assessment (SEA) developed by the MRC in more detail. The MRC Secretariat and the Office of the Chief Executive Officer are located in Vientiane, Lao PDR.

The following Chapter discusses some relevant water management and governance issues and aims to unwrap the development of the IWRM approach and definitions based on the relevant water literature, followed by an appraisal of the application of the IWRM approach.

¹³ For more information, see <http://www.mrcmekong.org/>

4 What Is Integrated Water Resources Management?

4.1 Water Management Issues

“Water is a key driver of economic and social development while it also has a basic function in maintaining the integrity of the natural environment” (UN-Water, 2008, 3). There are numerous factors and complex links between activities that influence and are influenced by how water is developed and managed. Drivers or factors that put pressure on water resources and affect the options and requirements for water management are mainly socio-economic by character but they also include less controllable factors such as climate change. Population growth is a very important driver, creating demand for more water and producing additional wastewater and pollution. (Hassing et al., 2009, 1.)

In addition, changing trade policies are influential driving forces behind the increasing water demand (Stockholm International Water Institute [SIWI], 2001, 7). “Climate change will have an impact on water availability and demand as well as on the occurrence of extreme events” (Giupponi, Jakeman, Karssenber & Hare, 2006, ix). “Apart from the requirement for equitable distribution of water among the stakeholders, governance, economic performance, and environmental quality are the crucial challenges facing water resources management. Water resources management must inevitably involve multi-objective tradeoffs in a multi-disciplinary decision-making process”. (Gupta, 2001, 931.)

Water management issues in Lao PDR have been given more visibility by global initiatives and networking. The initiatives are Global Water Partnership and World Water Forums. Lao PDR is a member of a the Asia-Pacific Water Forum (APWF) organised by World Water Forum which aims to support partnership and to identify and adopt solutions to various water issues throughout the region (VI World Water

Forum, 2012). As a member of GWP South East Asia,¹⁴ the country participates in and organises workshops and dialogue on issues related to water resources development and management.

Moreover, multilateral development banks such as the Asian Development Bank and the World Bank advocate water policy and legislation reforms and assist in improving institutional and regulatory frameworks on their development agenda to be implemented in their borrowing countries. Also, the role and involvement of the private sector has increased greatly, especially in hydropower development and urban water supply, which has decreased the role of the state in developing and managing of water resources. The New Economic Mechanism, opening up economic development and allowing the private sector to enter the markets, and renewed legislation has provided the private sector a chance to take part in water development. (Molle, 2005, 1.)

Water management can be generally defined as set of activities including planning, assessment, regulation, operation, monitoring, conflict resolution, and communication with an aim to balance the diverse uses, users, functions, and values related to water (Dukhovny, Mirzaev & Sokolov, 2008, 19; GWP, 2000; UNESCO-WWAP, 2003). Water management also includes the implementation of plans through institutional measures and by coordinating the construction of hydraulic works (Gupta, 2001). Rogers and Hall (2003, 4) identify governance as a distributed system composed of different parties with different roles and responsibilities. “In turn, water governance refers to the range of political, social, economic, and administrative systems that are in place to develop and manage water resources and the delivery of water services at different levels of society” (UNESCO-WWAP, 2003, 372).

Management of water resources is hindered by many uncertainties. These include ambiguities, unpredictability, and incomplete knowledge affecting management as well as problem identification, and problem solving, all of which need to be fully taken into account (Pahl-Wostl, Möltgen, Sendzimir & Kabat, 2005). “The search for water sustainability requires, first and foremost, that the full range of social and political pressures and processes that shape the use, development, and conservation

¹⁴ GWP South East Asia has been preparing a four year programme to improve water security and climate resilience in eight South East Asian countries. The programme objective is the integration of water security and climate resilience in development planning and decision making processes through enhanced technical, analytical and institutional capacity and predictable financing for climate change adaptation. GWP Laos organized a workshop on IWRM as a tool for Climate Change adaptation in cooperation with the Department of Water Resources and Department of Environment (GWP, 2011, 16, 30). For more information: http://www.gwp.org/Global/Documents_And_Downloads/GWP%20Workplan%202012%20Vol%201%20Exec%20Sum%20v10.pdf

of water systems are taken into account” (Ioris, 2008, 10) and “that a balance between economic and social development with ecosystem integrity is found” (UNESCO-WWAP, 2003, 370). According to Pahl-Wostl et al. (2007b), “sustainable water management should maintain the key functions of a water system in the long-term in order to avoid irreversible developments and catastrophic shifts towards undesirable states. This implies a need to maintain an “appropriate” adaptive capacity of the water system to ensure functional integrity in the context of changing external boundary conditions and to counter undesirable internal non-linear developments” (ibid., 8).

“Sound and effective water resources governance and related services are highly important to facilitating and supporting an enabling environment for integrated water resources management” (UNESCO-WWAP, 2003, 370). Many attributes and basic principles are considered essential for effective water resources management and good governance. Good governance requires, among many other things, openness and transparency of policy decisions as well as inclusiveness and communication when developing and implementing policies. Institutional¹⁵ development, the concept of participation and co-operation at all levels both horizontally and vertically, and co-ordination between different sectors in planning and decision-making are key issues of effective water resources management. Furthermore, policies and action must be coherent and integrative as the decision-making environment becomes more complex and multilevel and new challenges such as climate change emerge. Equity between and among the various interest groups, stakeholders, and consumer-voters needs to be carefully monitored throughout policy development and implementation processes. (Dukhovny et al., 2008, 23; GWP, 2004, 28; 2006; Rogers & Hall, 2003; UNESCO-WWAP, 2003; UN-Water, 2008.)

It is a widely held belief that water governance has to be strongly based on the rule of law as well as on the ethical principles of the society in which it functions. Other vital attributes of an efficient water sector are accountability and effectiveness of organisations related to the sector at all levels. Concepts of political, social, and environmental efficiency need to be balanced against simple economic efficiency. Responsiveness of the policies requires that they are implemented in a proportionate manner with decisions being taken at the most appropriate level. The institutions should also be built with an eye toward long-term sustainability. (Dukhovny et al., 2008; GWP, 2003; 2006; Rogers & Hall, 2003; UN-Water, 2008.)

¹⁵ Institutions are often referred to as “the rules of the game in society”, but more formally, they are “humanly devised constraints that shape human interaction”. Institutional constraints include both what individuals are prohibited from doing and, sometimes, under what conditions some individuals are permitted to undertake certain activities. (North, 1990, 3, 4.)

In its many different dimensions, water management is crucial also as regards achieving the Millennium Development Goals. Many poverty-related problems in developing countries are complex and multidimensional. As access to water plays a fundamental role in most of those dimensions, potential synergies between poverty eradication and sustained access to safe water are to be highlighted. Management of water could also play a key role in the integrated approach that is needed in a development policy that fosters poverty eradication. Water being a social, economic, and environmental good, all important aspects in a poverty eradication strategy should thus be seen as cross-sectoral issues to be mainstreamed into development activities. (SIWI, 2001, 14; UN-WWDR, 2009, 3.)

The importance of understanding transitions as multi-level processes has been emphasised by recent work on socio-technical transitions, an active area of research building primarily on complex systems and evolutionary approaches. “Decisions and management of water resources do not take place in isolation but are rather complex political processes that take shape at different semi-autonomous political levels. To link this understanding to concrete political actions, it may be useful to distinguish the levels explicitly” (Pahl-Wostl, Berkamp & Cross, 2006 in Pahl-Wostl et al., 2007a, 49):

- The Context level – incorporating the wider political and institutional environment which determines the governance structure.
- The Network level – policy arenas which determine the participating actors and type of institutions; who is in and who is out of the process and thus also the boundaries and framing of the problems and solutions taken into account.
- The Social Interaction or Game level – institutions and rules that shape individual behaviour, collective negotiation, and learning and decision-making processes.

As previously discussed, this research uses the operational, organisational, and constitutional levels (see Figure 9) to analyse the implementation of integrated water resources management (IWRM) approach and related themes of integration, decentralisation, and participation. When discussing the different water management levels defined by Pahl-Wostl, Berkamp and Cross (2006 in Pahl-Wostl et al., 2007a), the context level in this research refers to the Laotian socio-economic, political, historical, and natural environment which are discussed and described in the research to increase understanding regarding water management/governance and water reforms (IWRM) and policies. The context shapes the governance structure and institutions. The constitutional level, which is one of the examination levels of

this research, touches the Context level as it includes laws, constitutions, and norms guiding the management of water resources.

The Network level is affiliated with the relationships established between interdependent institutions, and their cooperation. “The context level determines how the network level will be formed and function, and in turn the network level will determine how organizations will play the game.” (Pahl-Wostl, Berkamp & Cross, 2006 in Pahl-Wostl et al., 2007a, 51.) The network and organisational levels both refer to policy arenas of water management regime where the use or control of water resources is implemented. “Fundamental reform cannot be bounded to water governance only, since water management regimes are closely intertwined with the overall societal context” (Pahl-Wostl, 2007a, 14). Social interaction or networks take place in the societal/game level, where individuals and organisations make decisions (Pahl-Wostl et al., 2007a, 52). The Operational level is closely intertwined with the network level and overall societal context.

It is relevant to notice that that water sector is surrounded by much wider governance issues, most of them affecting water resource management and governance. “The challenges facing the sector are systemic in nature and inextricably linked to broader social, political and economic issues of water governance.” (UNESCO-WWAP, 2003, 370.) The following diagram presents the various interacting factors within water management process.

In Figure 8 Dukhovny et al. (2008) show the complexity and multifaceted nature of water resources management process. It includes a number of principal components: available water resources, engineering infrastructure, demands, allocation procedure, delivery service, and use of water. Each component is related to both the social situation and economic and political conditions. “Diverse water sources, their interrelations, different sector interests, different impacts and consequences, various management tools and mechanisms, and complicated water infrastructure – all these components transform the proper engineering task into a very sophisticated co-ordination of a huge number of links providing balance within this system. By aiming to provide the balance of different interests, current and long-term goals, economic development and conservancy, etc., it is necessary to apply a holistic approach for solving this task” (Dukhovny et al., 2008, 19, 20). As was shown in Figure 1 in Chapter 1.1, it is vital to provide an enabling environment and proper and effective management instruments (GWP, 2000) to deal with this challenge.

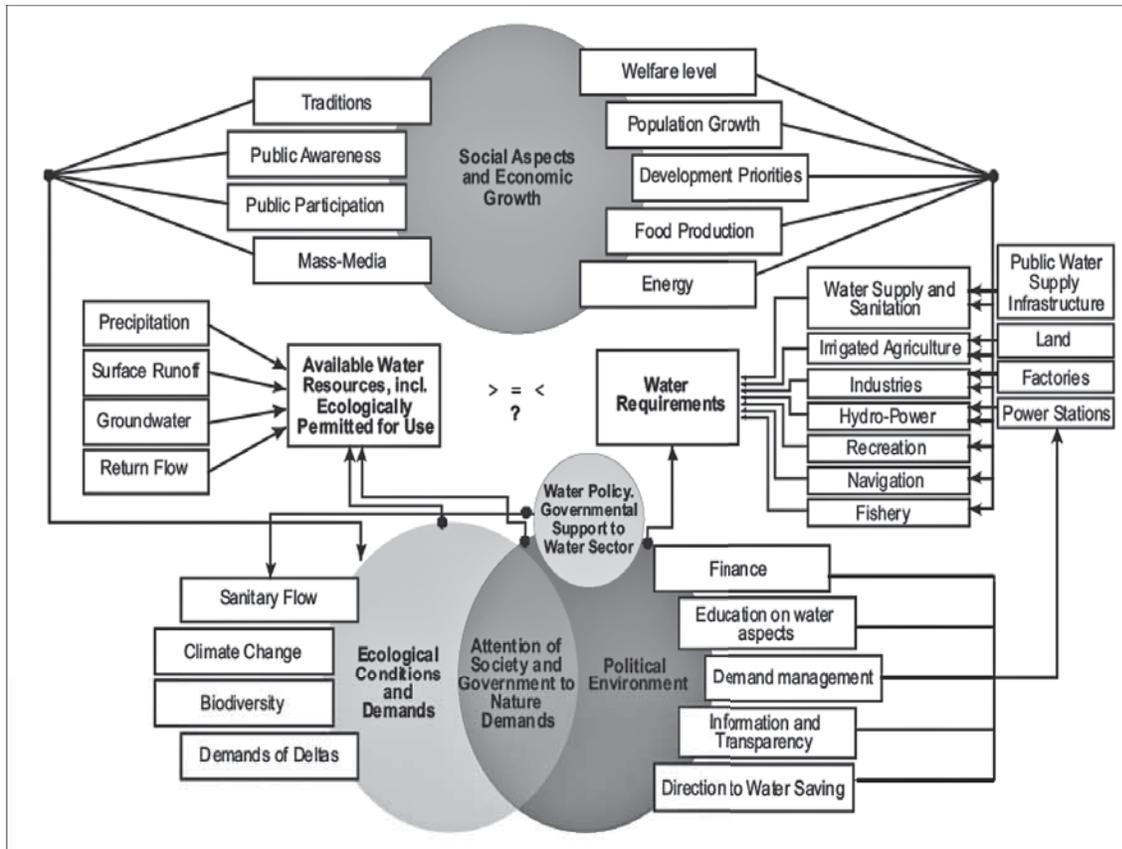


Figure 8: Interacting Factors within Water Resources Management Process
(Dukhovny et al., 2008, 20)

4.2 IWRM Evolution and Definitions

“Water resources management has been shaped by a variety of paradigms reflecting the evolution of government policies and transient societal values” (Hooper, 2005, 2, 3). “Various kinds of integrated frameworks for water management have been proposed in order to incorporate the different water-related aspects and perspectives more comprehensively together” (Keskinen, 2010, 3). Integrated Water Resources Management (IWRM) approaches lean very much on the concept of sustainable development highlighted in many water-related international conferences (see e.g. Brown et al., 2005; Mukhtarov, 2007; Rahaman & Varis, 2005) and try to achieve sustainable water development and management practices in the water sector. It has also been argued that “IWRM is conceptually based on the theories of planning, especially strategic planning ideas and is guided by three principles of integrated resources management: coordination, participation and consideration of multiple

levels of governance.” (Mukhtarov, 2007, 616.) Pahl-Wostl, Jeffrey, Isendahl, and Brugnach (2011, 845) have described IWRM as pursuing integrationist agenda.

Many trace the roots of IWRM to the 1940s and the founding of the Tennessee Valley Authority (TVA)¹⁶ in 1933. TVA was established in order to develop the water resources of the region (Barkin & King, 1986; Tortajada, 2005 in Varis & Rahaman, 2008b, 15; <http://www.tva.com/>), a 106,000 km² area encompassing parts of seven states (GWP, 2004, 24). Established by F.D. Roosevelt during the New Deal, TVA was the first experiment in regional development to be based on full control of the river system through a network of multi-purpose reservoirs. “TVA would not only attempt to “fully” control the river system by a series of dams, thus providing protection from floods and producing hydropower, but would also tackle poverty by an ambitious range of activities, including training, agricultural extension services, soil conservation, afforestation, production of fertilisers, stimulation of local enterprises and welfare-oriented programs focusing on education, health, and sanitation”. (Molle, 2008, 140.) TVA continues to be responsible for a range of water-related activities – minimising flood risk, maintaining navigation, providing recreational opportunities, protecting water quality, and generating power – within the Tennessee River basin (GWP, 2004, 24). Mekong Committee was established basing on the model of TVA (Akiba, 2010; Brühl & Waters, 2009).

The concept of Integrated Water Resources Management (IWRM), an approach that views competing water needs in an equitable, efficient, and sustainable manner, has recently been found as a significant conceptual solution to complex and varied problems of water resources management. It has been adopted widely by water managers, decision-makers, and politicians around the world (UNDP, 2009; UN-Water, 2007, 1). Pursuing a more holistic vision and management of water, the IWRM concept came forth starting from the Rio (UN, 1992a) and Dublin Conferences in 1992 (UN, 1992b) (Mukhtarov, 2007). During the Dublin International Conference on Water and the Environment (1992), it was agreed and recommended that the four principles described in the Info box below were to guide global water management and development efforts:

¹⁶ For more information, see <http://www.tva.com/>

Concerted action is needed to reverse the present trends of over-consumption, pollution, and rising threats from drought and floods. The Conference Report sets out recommendations for action at local, national and international levels, based on four guiding principles.

Principle No. 1 – Fresh water is a finite and vulnerable resource, essential to sustain life, development and the environment

Since water sustains life, effective management of water resources demands a holistic approach, linking social and economic development with protection of natural ecosystems. Effective management links land and water uses across the whole of a catchment area or groundwater aquifer.

Principle No. 2 – Water development and management should be based on a participatory approach, involving users, planners and policy-makers at all levels

The participatory approach involves raising awareness of the importance of water among policy-makers and the general public. It means that decisions are taken at the lowest appropriate level, with full public consultation and involvement of users in the planning and implementation of water projects.

Principle No. 3 – Women play a central part in the provision, management and safeguarding of water

This pivotal role of women as providers and users of water and guardians of the living environment has seldom been reflected in institutional arrangements for the development and management of water resources. Acceptance and implementation of this principle requires positive policies to address women's specific needs and to equip and empower women to participate at all levels in water resources programmes, including decision-making and implementation, in ways defined by them.

Principle No. 4 – Water has an economic value in all its competing uses and should be recognized as an economic good

Within this principle, it is vital to recognize first the basic right of all human beings to have access to clean water and sanitation at an affordable price. Past failure to recognize the economic value of water has led to wasteful and environmentally damaging uses of the resource. Managing water as an economic good is an important way of achieving efficient and equitable use, and of encouraging conservation and protection of water resources.

Info Box 2: The Guiding Principles from Dublin (UN, 1992b)

These principles have strongly influenced the development of IWRM. “Seeking to put the Dublin Principles into practice, IWRM emphasises the key concepts of integration, decentralisation, and participation as well as economic and financial sustainability” (Xie, 2006, 6). “The Dublin Water Principles bring water resources

firmly under the State's function of clarifying and maintaining a system of property rights, and, through the principle of participatory management, asserts the relevance of meaningful decentralisation at the lowest appropriate level" (Rogers & Hall, 2003, 17).

"After the Earth Summit, the concept of IWRM was further developed and fine-tuned in a set of water related conferences, including the International Conference on Freshwater in Bonn in 2001 as well as the series of World Water Forums" (Rahaman & Varis, 2005; 2008 in Keskinen, 2010, 22, UNESCO-WWAP, 2012; 2009; 2006; 2003). The United Nations World Water Development Reports (WWDRs)¹⁷, released every three years in conjunction with the World Water Forum, aim to provide decision-makers with the tools to implement sustainable use of water, including IWRM. The prime importance of IWRM was also recognised in the World Summit on Sustainable Development in Johannesburg in 2002 (WSSD, 2002, 15) and as a follow-up to the MDGs it was further agreed at the Summit through the Johannesburg Plan of Implementation (JPOI) to "Develop integrated water resources management and water efficiency plans by 2005, with support to developing countries, through actions at all levels" (UN-Water, 2008, 7).

The aim of the current water management orthodoxy of IWRM is to discard the one-sided management perspective that focuses on the interests of one sub-sector by one government agency and to strive for a participatory, multi-sided management perspective including all interests and stakeholders (water users, civil society, governments, and the private sector) in water resources management. IWRM tries to take into account all natural aspects of the water resources, all sectoral interests and stakeholders, the spatial and temporal variation of resources and demands, relevant policy frameworks, and all institutional levels. (EC, 2006, 7; GWP, 2000, 23–29; van Hofwegen, 2000, 137.) Integrated water resources management and ability to compromise is required to balance water uses and available resources as well as land use and ecological services (SIWI, 2001).

According to Xie (2006) a few key elements of IWRM can be distracted from the definitions of IWRM by GWP (2000, 22). A more functional definition used by the United States Agency for International Development (USAID) states that IWRM:

- ◆ is a coordinated process that brings stakeholders together;
- ◆ focuses on both economic and social welfare and equity as well as protecting ecosystems;
- ◆ uses scientific data and tools to provide sound base for judgment; and

¹⁷ More information available at UNESCO's website: <http://www.unesco.org/new/en/natural-sciences/environment/water/wwap/wwdr/>

- ◆ emphasises proper governance involving democratic participation. (Xie, 2006, 32.)

IWRM emphasises the importance of institutions in the successful implementation of the approach. “This is understandable as putting IWRM into practice is a long-term process that often requires significant changes in the interactions between politics, laws, regulations, institutions, civil society, and water users. The capacity to make these changes depends on establishing better governance systems”. (Rogers & Hall, 2003, 5.) Nowadays, fragmented institutional structures, centralised planning, and under-resourced local level entities hamper equitable, efficient, and sustainable water resources management along with insufficient participation, data availability, reliability, and accessibility issues (Biswas, 2008; Gupta, 2001; Ioris, 2008; UNESCO-WWAP, 2003, 379) in many developing countries, e.g. Lao PDR.

4.3 Application of IWRM

Many issues and options are presented or should be integrated to promote effective planning, management, and operation of water resources under the IWRM approach, related IWRM literature, and operational publications. Ideally, all relevant aspects should be considered and integrated. The different dimensions of integration can basically involve sectoral and territorial integration, including integration of different scales. (see e.g. Brown et al., 2005). According to GWP (2000, 23–26), integration can be divided into two basic categories: the natural system, with its critical importance for resource availability and quality, and the human system, which fundamentally determines resource use, waste production, and pollution and is in charge of setting the development priorities. Integration has to occur both within and between these categories, taking into account variation in time and space.

According to GWP (2000, 23–26) natural system integration involves issues such as freshwater management, coastal zone management, land and water management, “green water¹⁸” and “blue water,¹⁹” surface water and groundwater management, quantity and quality in water resources management, and integration of upstream and downstream interests. The cross-sectoral integration between water use sub-sectors and the role of IWRM in their linkage is previously presented in Figure 1 in the introductory chapter.

¹⁸ Green water refers to the portion of rainfall that is stored in the soil and evaporates from it or is incorporated in plants and organisms (FAO, 2009; World Water Council, 2000, 11).

¹⁹ Blue water refers to renewable water resources, the portion of rainfall that enters streams and recharges groundwater (FAO, 2009; World Water Council, 2000, 10).

When considering the integration of human system mainstreaming of water resources, it is important to ensure that governmental policies, financial priorities, and planning (economic, physical and social) at every level consider the implications for water resources development, water use, and water-related risks. Water resources policies must be integrated in national economic and sectoral policies. Conversely, economic and social policies need to take the water resource implications into account. (GWP, 2000, 26.) “The involvement of the concerned stakeholders in water resources management and planning is universally recognised as a key element in obtaining a balanced and sustainable utilisation of water” (ibid., 28). At present the links between water management at different levels are often disjointed, conflicting, or top-down. There is a need for water management that is both top-down and bottom-up (GWP, 2003, 17, 33). “What matters is that linkages are made across spatial scales and levels of decision-making, with actions at one level reinforcing and complementing action at other levels.” (GWP, 2009c, 4.)

The development stage of the country affects the role of IWRM. “Developing countries, countries in transition and developed countries will have different ways of implementing the IWRM process and therefore will also derive different benefits.” (Jønch-Clausen, 2004, 15). “Developing countries, depending on the availability of water resources, will in particular see sustainable water resources management as an important element in tackling issues of poverty, hunger, health and environmental sustainability, whereas typically industrialised countries in transition tend to consider IWRM as a more rational approach to increase the effectiveness of the way they manage their resources, thus assisting a continuous development of their economies.” (Medema & Jeffrey, 2005, 16.)

The implementation in IWRM and the process of translating IWRM goals into practice and ultimately into water sustainability constitute a road filled with challenges. One of these challenges is integration and the extent to which it can be achieved. Water resources are used in many sectors and many institutions and organisations are engaged in water management, which further contributes to making the issue challenging. Integration is not an end to itself but there is a need to prioritise the most important issues (Hassing et al., 2009, 6). Katko and Rajala (2005, 311, 322) accentuate that water use purposes and their priorities need to be taken into account in developing integrated water resources at national, regional, and local levels. Decision-makers have to prioritise and make sure that all important aspects are included in any assessment, management plan, or water resources development process (Hassing et al., 2009, 6). To reach that situation, co-ordination is one of the first steps. However, there are many issues, like funding, human capacity, institutional barriers, resources, and needs, which are in contrast to theoretical

management universe. These factors set operational limits and determine how far integration can be taken. (Hassing et al., 2009; see also Biswas, 2008, 21; Ioris, 2008; Rahaman, 2009, 9, 25.)

IWRM is a political process (GWP, 2000) involving different interest groups with competing demands for water (Collentine et al., 2002). It deals with water reallocation, allocation of financial resources, and the implementation of environmental goals (GWP, 2004). Keskinen (2010) states that many analyses on the challenges of water management in the Mekong area fail to understand this nexus. Failure to understand that water management is inherently political may also mean that non-scientific forms of knowledge are not taken into account. “Finally, the strong normative content of most integrated approaches, visible particularly in their attempt to integrate issues that in many contexts are not really commensurable, may become neglected.” (Ibid., 9.)

The IWRM concept is undoubtedly the most popular concept for water management in the contemporary global rhetoric (UNDP, 2006). “Integrated approaches have been accepted widely and often uncritically as the most suitable approach for water management and therefore they strongly guide and frame current management practices.” (Keskinen, 2010, 13.) In practice IWRM is a very complex concept since it cuts across boundaries and involves a number of agencies, often with competing or conflicting interests and water use purposes. “Due to intensified globalisation, the IWRM concept readily travels across nations and has already turned into a truly global concept. This transfer of IWRM occurs at multiple levels and constitutes high complexity – it is crucial that this is understood” (Mukhtarov, 2007, 611). Researchers need to understand how concepts, such as resilience, vulnerability, and adaptive capacity, are involved in systemic change (Pahl-Wostl et al., 2007b). Van der Keur et al. (2006) have successfully identified and mapped various sources of uncertainty²⁰ in the whole IWRM cycle.

In addition, the concept of IWRM is defined in rather general terms and has in many instances proved to be difficult to interpret for practical purposes. While IWRM is a very well recognised and approved approach, the implementation of IWRM is a challenging task (see e.g. Biswas, 2008; Jeffrey & Gearey, 2006; Lahtela, 2002; Rahaman & Varis, 2005; van der Keur et al., 2006). A particular problem with IWRM is that it has been seen as a kind of one-approach-fits-all concept that can be used in different ways depending on the needs and desires of different

²⁰ The authors belonging to NeWater group have classified the type of uncertainty (data, models, multiple frames, and context) at the various occurrences in the IWRM process with respect to sources, nature, and type of uncertainty. They have developed a common terminology that tries to honour the most important aspects from natural and social sciences and their application to the entire IWRM process. Further information available at: <http://www.newater.info/index.php?pid=1063> (NeWater D 1.1.3)

actors irrespective of the actual circumstances. “While such a context specificity is naturally important (and an inherent part of the entire concept), the vagueness of the very definition of IWRM makes the discussion about its theoretical underpinnings and the actual practices more challenging – and also exposes the entire concept for intentional and unintentional misuse.” (Keskinen, 2010, 24.) Biswas (2008) also argues that a close analysis shows that there are many problems both in the IWRM concept and its usage, especially as regards large projects. There is no agreement on fundamental issues such as what aspects of water resource management should be integrated, how, by whom, or even if broad integration is possible. Biswas (id.) continues that, in the real world, the concept will be exceedingly difficult to implement.

Some major knowledge gaps have been identified in the conceptual foundation, management paradigm, and transition processes that may impede the successful implementation of new water management approaches, like the IWRM approach (e.g. Jeffrey & Gearey, 2006; Pahl-Wostl & Sendzimir, 2005). Medema and Jeffrey (2005, 37) argue that “the principles of IWRM have not been elaborated with a view on management under uncertainty, nor do they specifically articulate adaptive capacity as a significant feature of water management strategies”. “The sector is in transition with theory way ahead of practice and even further ahead of the capacities (skills, knowledge sets, competencies, etc.) required to effect integrated adaptive regimes” (Pahl-Wostl et al., 2011, 846). Pahl-Wostl and Sendzimir (2005) argue that “Adaptive Water Resources Management (AWRM) is an approach to advance IWRM to a stage where it can deal with uncertainty and to point out the necessity of flexible governance systems and management strategies”.

In other words, there is a need for a change towards adaptive strategies for IWRM. Through adaptive management approaches, more attention can be paid to the complexity and uncertainties of the systems. “In general terms, adaptive management approaches can be defined as systematic strategies for improving management policies and practices by learning from the outcomes of previous management actions” (Pahl-Wostl et al., 2007b). “Adaptive management approaches can advance IWRM to a stage where it can deal with uncertainty and point out the flexible governance systems and management strategies” (Borowski & Kastens, 2009, 2; Pahl-Wostl & Sendzimir, 2005 in van der Keur et al., 2006, iii). At the same time the normative principles of ‘good water governance’ should be followed (Pahl-Wostl et al., 2010, 572).

Molle (2008, 132–150) also deals with this issue in a controversial paper and names the IWRM concept as the “main ubiquitous nirvana concept” in the field of water. IWRM faces two difficulties inherent in the “nirvana concept.” By its very nature,

it is an attractive yet woolly consensual concept (nobody is against nirvana). Such concepts typically obscure the political nature of natural resources management and are easily hijacked by groups seeking to legitimise their own agendas. According to Molle (2008, 150), “nirvana concepts such as IWRM tend to reflect the ideologies and interests of powerful parties and include more active processes of snowballing and paradigm maintenance by which concepts may become hegemonic and fuel normative and prescriptive policy-making.”

It is important to note that IWRM is a process and there are no universal blueprints and stereotyped approaches to follow in moving towards more integrated approaches of water resources development, management, or use. Instead, IWRM is a broad set of principles, tools, and guidelines, which must be tailored to the specific context of country, region, and/or river basin. (Dukhovny et al., 2008, 25; GWP, 2000, 6, 7; UN-Water, 2008, 7; Xie, 2006, 4; Yoshida, 2008.) The IWRM approach should be custom-made on the basis of the country’s priority objectives, capacity, and resources endowment taking into account the political will and appropriate social environment in the country. The details in planning and implementation must reflect local water issues and management conditions. (Jønch-Clausen & Fugl, 2001; UN-Water & GWP, 2007.)

As IWRM Roadmapping Initiative²¹ recognises, different countries will need a different set of actions suited to their particular needs and that time schedules for implementation of the IWRM approaches and programs to water resources development and management differ from country to country.

Nations’ ways in water use and environmental concerns are deeply rooted in history, habits, culture, and values. In other words, the IWRM approach should take them into account. “In this context, IWRM could be recognised as a social innovation by the people of the present generation for the benefits of present and future generations.” (Yoshida, 2008.) “Countries and communities can also draw on existing tools and learn from each other’s experiences – thereby increasing their chances of success” (GWP, 2004, 42).

“The initiation of IWRM approach cannot be an instantaneous action and has to develop gradually and quite systematically” (Dukhovny et al., 2008, 25) allowing flexibility in implementation. Past experiences have shown that the implementation of IWRM involves many issues to be developed and is time-consuming (see e.g. Jønch-Clausen, 2004). Time is needed to fully develop a sector policy, to make necessary changes to legal and institutional frameworks and to strengthen human

²¹ IWRM Roadmapping Initiative is facilitated by the Government of Denmark in collaboration with UN-Water, the Global Water Partnership and representatives of governments. <http://www.unsgab.org/hapi/iwrm/docs/Roadmapping-IWRM.pdf>

resources (capacity building) and co-operative frameworks (EU, 2009, 16). Therefore, transition towards IWRM requires ensuring thorough understanding through developing an action plan (Dukhovny et al., 2008, 25; Hassing et al., 2009, 9).

To establish effective water governance systems and put IWRM into practice, there is a range of tools available to policy makers and practitioners as described in a large range of literature (Rogers & Hall, 2003, 30). For example, the GWP ToolBox for Integrated Water Resources Management (GWP, 2009a) brings together an array of over fifty tools and references that can be used by practitioners to overcome governance failures and it is supported by experiences from around the world (ibid.). NeWater project (2006)²² has identified and reviewed IWRM tools including the Global Water Partnership ToolBox, tools in FP5 Harmoni-CA/CatchMod projects, tools including uncertainty, economic tools, tools supporting participatory processes, decision support systems, and tools for integrated framework. All selected topics were reviewed according to the defined “level” of tools, classification of tool characteristics, and tool availability for supporting adaptive water resources management.

“Different countries will need to identify which management tools or instruments are most important and appropriate given their specific circumstances” (Rogers & Hall, 2003, 30, 31). “Although the key IWRM documents emphasize the critical importance of context-specificity, they in fact fail to provide the actual means to operate in different contexts, including the ways to recognize the most appropriate methods and tools for the specific contexts” (Keskinen, 2010, 57).

Based on IWRM literature and research done in Lao PDR while implementing policies and reforms such as the IWRM, it seems to be important to take both local conditions and the bigger picture – the social, political, historical, cultural, and natural/physical context of a country – into account. It also seems that while implementing IWRM principles, a pragmatic approach works best, especially when bearing in mind that attributes of the existing institutional structures and practices of the regime determine how the IWRM process will be developed.

In addition, raising the capacity of the government at different levels seems to be a highly relevant issue for successful IWRM adoption and implementation, as shown

²² The overall conclusion from the review is that there are many existing tools suitable for adaptive IWRM. The challenge is how to implement them successfully for this purpose. It has surmised that when shifting from strictly natural science tools for water resources management to inclusion of social science, the success or failure of a given tool is likely to be more dependent on stakeholder involvement, communication between scientists, professionals, water managers, and stakeholders, and their beliefs than the quality of the tool itself. Verification of a tool from a natural science perspective is not necessarily possible. Instead the results reflect human beliefs and are therefore more subjective (Barlebo, 2006, 15).

in the research Articles. Without proper technical, financial, and human resources it is impossible to successfully initiate IWRM processes. Research literature shows that the IWRM principles work best when the governance system itself works well. As implementation of IWRM is very complicated and multi-disciplinary process, more flexible governance systems and action plans are needed. The ability of governance structures to improve knowledge sharing in decision-making and to facilitate social learning seems to be important attributes to improve IWRM implementation.

5 Discussion and Results: Integrating IWRM Elements to the Context of Water Resources Development and Management in Lao PDR

Problems and challenges relating to water and environment are expected to intensify and grow in the future and water resources need to be managed in a more integrated and holistic manner in Lao PDR and the whole Mekong Basin area. Each Lower Mekong Basin (LMB) country, i.e. Thailand, Cambodia, and Vietnam, is at a different stage of implementing IWRM principles. “They all made a commitment to IWRM at the World Summit on Sustainable Development in 2002 and developed clear statements regarding national water-related policies and strategies as well as institutional and regulatory frameworks to support these policies” (Bach et al., 2011, 13). “A country’s contextual features, such as the overall economy, political system, legal system, cultural background and its physical resource base are affecting and could circumscribe the policies and actions in the water sector” (Bandaragoda, 2006, 9).

The shape and degree of IWRM implementation vary between countries, ranging from taking the first steps towards incorporating IWRM principles into national development agendas to making IWRM-based national strategies and plans, water law, and legislation. Lao PDR and other LMB countries are already piloting the establishment of river basin organisations (RBO) founded on IWRM-based national strategies and plans. These developments can be seen as steps towards a more inclusive and decentralised approach. (AMRC, 2007).

IWRM means decision-making concerning development and management of water resources for various uses. Three levels can be considered at the level at which actions and decision-making occur and where integration occurs: the *operational* or water use level, the *organisational* or water resource management level, and the *constitutional* or water policy and law level (Lord & Israel, 1996 in van Hofwegen, 2000, 140; Rogers & Hall, 2003, 21).

The operational function is focused on the use or control of water for specific purposes to fulfil specific needs and demands. These include water supply and

sanitation, hydropower, irrigation and drainage, flood protection, industrial supplies, tourism and recreation, fisheries, navigation, and environmental management. They can be in public or private hands. To minimise the problems and conflicts of these different uses and users, coordination of water use and water allocation is required. Solving these problems also requires establishment or changes of water use rules. This is the organisational level/function. It involves co-ordination, planning, decision-making, and policing of water use and users in water systems (river basins, aquifers). The constitutional function creates the enabling environment within which the other functions operate. It sets out water policies and legislation, institutional development policies, including human resources development and normative and executive legislation taking into account external governance and political imperatives. (Lord and Israel, 1996 in van Hofwegen, 2000, 140; Rogers & Hall, 2003, 21.) Figure 9 presents the functions in integrated water resources management.

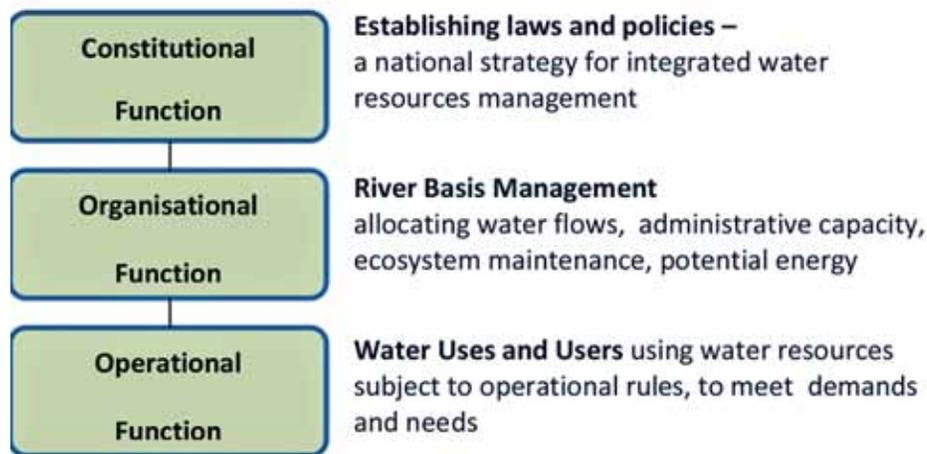


Figure 9: Functions in Integrated Water Resources Management (van Hofwegen, 2000, 140)

For the discussion of integrating IWRM approaches to the context of water resources management in Lao PDR, the key Dublin Principles (presented in the Info Box 2) or the elements of *integration*, *decentralisation*, and *participation* commonly considered and accepted to be vital for the implementation of integrated water management (GWP; 2004; Xie, 2006), are discussed and analysed from the viewpoint of the constitutional (water policy and law), operational (water use) and organisational (water management) levels. The discussion and analyses are based on Articles I–IV. The political and institutional environment of Lao PDR are challenging for

implementing these bottom-up approaches to facilitate IWRM. The Management and Transfer Framework (MTF) and Institutional Analysis and Development (IAD) approach have been utilised in the research to provide a framework for interpreting the implementation processes of these reforms.

Table 2 presents a simplified description of how the IWRM principles of integration, participation, and decentralisation are reflected in Articles I–IV in the fields of hydropower (Article I and III), irrigation sector (Article IV), and institutional frameworks of Laotian water regime (Article II). A key research question arising from the articles has been formulated and presented in the last row of the table. Basically this Chapter aims to provide answers to the question “how have the IWRM elements been implemented in different water use sectors and at constitutional, operational and organisational levels in Laotian water regime?” When the articles were written these research questions were not imminent. As the articles are authentic descriptions of specific research themes and contexts, only now, at the analysis and synthesis phase of the research, have these questions arisen from the articles. Many of the articles’ key findings, especially as regards the findings of Articles I and III on hydropower and Article II on institutional development of Laotian water regime, have supported research of the FREPLA2020 and In-Balance Project and vice versa.

What follows is a discussion based on the research articles about the elements of IWRM: integration, decentralisation, and participation in Laotian institutional environment and in the hydropower and irrigation sectors. These principles are analysed regarding the constitutional (Laotian laws and safeguards), operational (hydropower and irrigation), and organisational (Laotian water regime) levels.

Table 2: Synthesis on the Reflection of IWRM Principles as Revealed in the Published Articles

IWRM Element	Article 1 – Challenges in Developing Sustainable Hydropower in Lao PDR	Article 2 – Progress towards Integrated Water Resources Management in Lao PDR	Article 3 – The Asian Development Bank and the Case Study of Theun-Hinboun Hydropower Project in Lao PDR	Article 4 – Irrigation Management Transfer in Lao PDR: Prospects and Issues
Integration	<p>Revision of sectoral and environmental legislation/safeguard policies:</p> <ul style="list-style-type: none"> • EIAs, SEIAs • National Hydropower policy • MRC policies: Strategic Environmental Assessment (SEA), Initiative on Sustainable Hydropower (ISH) • Evaluation and replication the lessons learned of the Nam Theun 2 Hydropower Project (environmental and social safeguard policies) 	<p>Water sector modernisation:</p> <ul style="list-style-type: none"> • Establishment of WREA, LNMC • Establishment of RBOs – Nam Ngum River Basin as a pilot <p>Development of national and sub-national policy and legislative framework:</p> <ul style="list-style-type: none"> • National Water Policy, National Water Resources Strategy and Action Plan for 2011-2015, revised Nation Water Law <p>Improved data management:</p> <ul style="list-style-type: none"> • data networks (NARBO, etc.) 	<p>Revision of sectoral and environmental legislation/safeguard policies:</p> <ul style="list-style-type: none"> • EIAs, SEIAs, CIAs • National Hydropower Policy • MRC policies: Strategic Environmental Assessment (SEA), Initiative on Sustainable Hydropower (ISH) 	
Participation	<p>Public hearings, consultations</p> <p>Dissemination of hydropower project information</p>	<p>Training and capacity-building programmes for IWRM</p> <p>Developing of river basin planning procedures through community and stakeholder awareness and participation (stated in National Water Policy, National Water Resources Strategy and Action Plan for 2011–2015),</p> <p>Education and public awareness-raising schemes</p>	<p>Public hearings, consultations</p> <p>Dissemination of hydropower project information</p>	<p>Establishment of WUAs and WUGs</p> <p>Farmers participation and initiative in irrigation project operation and maintenance</p>
Decentralisation		<p>Establishment of RBOs (Nam Ngum River Basin as a pilot project)</p> <p>Provincial/local level WREA (now MONRE) units</p>		<p>Transfer ownership and management of irrigation schemes to beneficiaries through local WUAs/WUGs</p>
Research Question	<p>How have the IWRM elements been implemented at operational level in the hydropower sector?</p>	<p>How have the IWRM elements been implemented at constitutional and organisational level in Laotian water regime?</p>	<p>How have the IWRM elements been implemented at operational level in the hydropower sector in the case of Theun-Hinboun project?</p>	<p>How have the IWRM elements been implemented at operational level in the irrigation sector?</p>

5.1 Integration

IWRM is a coordinated process that brings stakeholders together. In contrast to sectoral approaches that have largely failed in the past, IWRM's first approach to the Dublin Principle 1 (UN, 1992b) is to advocate a holistic approach that emphasises three goals: economic development, social welfare, and environmental protection. In addition, the holistic approach integrates management of all horizontal sectors that use and/or affect water. Acknowledging the multifaceted value of water, IWRM demands that social concerns and environmental values are recognised while still emphasising the need to develop water resources for sustainable economic development. (Xie, 2006, 6.)

“In order to effectively coordinate between different water use sectors (water supply and sanitation, agriculture use, energy generation, industrial use, environmental protection, and other sectors), new institutions and policies are required” (id.). “IWRM advocates creating and empowering basin-level organisations to direct water resource management efforts in a hydrological boundary as stated by Hague Forum (2000), the Bonn Conference (2001), and the WSSD Summit (2002). Vertical integration is required to coordinate efforts between local, regional, national, and international water user groups and institutions along with horizontal integration between sectors” (ibid., 7).

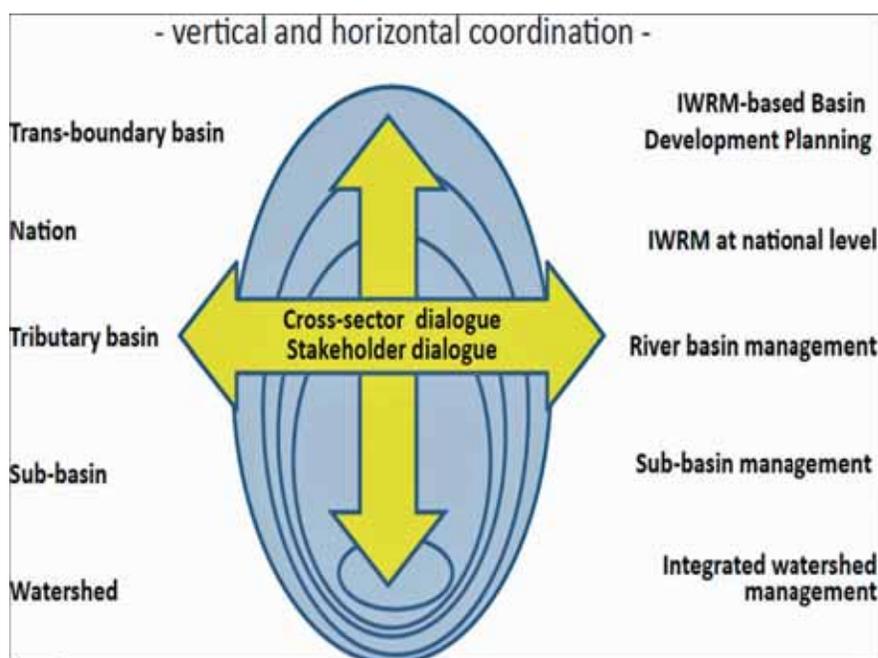


Figure 10: IWRM in Linking Local and Regional Levels and Promoting Horizontal and Vertical Coordination (Bach et al., 2011, 8)

Water development and management should be based on a participatory approach, involving users, planners, and policymakers at all levels (Cap-net, 2012). According to Bach et al. (2011) experiences with watershed and river basin management show that both top-down and bottom-up management approaches are needed and that institutional arrangements must provide for linkages between the local and the national or regional levels as shown in Figure 10. IWRM is a process that should be implemented at all scales, from the watershed through to the basin. At all levels (watershed, sub-basin, tributary basin, national and transboundary basin), the IWRM approach is used to address sustainable development and management of land and water resources, aiming at transparency and openness. (Bach et al., 2011, 8.) In Lao PDR this has not taken place yet as the IWRM approach has been initiated at the ‘upper levels’ of basin management – at the national and transboundary basin levels (Mekong River basin and a pilot project at the Nam Ngum Riverbasin).

It is desirable to implement IWRM through a combination of integrated watershed management and integrated river basin management to ensure appropriate dialogue across sectors and amongst concerned stakeholders. “Cross-sector and cross-scale information and dialogue are essential to improve coordination and help position watershed management as an integral part of river basin management”. (Bach et al., 2011, 8.) “Creating a water-sensitive political economy requires co-ordinated policy-making at all levels (from national ministries to local government or community-based institutions)” (GWP, 2000, 15). However, this is not the case in Lao PDR. As Article II revealed, the degree of vertical and horizontal integration of the IWRM policy and dialogue among government organisations is still weak. This issue was also highlighted by many participants of FREPLA2020 workshops and numerous interviewed officials.

“Integrated water resources management requires cross-sectoral analysis to identify emergent problems and integrate policy implementation and adaptive responses to new insights” (Pahl-Wostl, 2007b). In order to facilitate coordinated water resource management, rigorous data collection and distribution for multiple physical and socio-economic measures are required (Xie, 2006, 6). There is also a need for mechanisms which ensure that economic decision-makers take water costs and sustainability into account when making production and consumption choices (GWP, 2009a). “The development of an institutional framework capable of integrating human systems – economic, social and political – represents a considerable challenge” (GWP, 2000, 15).

Article II analyses the institutional environment and legal frameworks for the water sector in Lao PDR. It accentuates the need for proper and firm legislative framework regarding water to support and enable IWRM implementation in Lao

PDR. This is also in line with the statements of UN's World Water Assessment Programme (UN-WWDR, 2009). Effective water resources policy should be based on a strong legislative framework, where the roles and responsibilities of actors are clearly defined, social, economic and ecological value of water is defined, and interrelations between sectors – agriculture, energy, environment, and others – and links with general socio-economic development are clearly determined (Dukhovny et al., 2008, 23, 25).

There is an obvious need for a clearer organisational strategy for implementing key IWRM functions in Lao PDR. This is one of the major findings of Article II. In response to the fragmented and diversified water-related roles and responsibilities between national agencies and sector-driven development, the country has modernised and reformed its national water and environmental management agencies and their divisions. Lao National Mekong Committee, acting as a water sector apex body, has been established as a senior advisory and coordinating body with the responsibility to consistently guide all agencies in the water sector on the management, development, conservation, and use of water resources. Water Resource and Environment Administration (now Ministry of Natural Resources and Environment (MONRE)) was established with the responsibility to carry out management of water resources, environment, meteorology, and hydrology activities throughout the country. (WREA, 2010a, 4.) Established only recently (2011), MONRE replaced WREA as responsible for IWRM (Jønch-Clausen, 2011, 7).

The establishment of MONRE aims to a more holistic approach and improved governing of natural resources and the environment. The founding of MONRE may address the coordination difficulty faced in the Laotian governance structure more efficiently. As described in Chapter 3.3, the Ministry is built on existing organisations instead of establishing a whole new organisation. The Ministry may deal with cross-sectoral issues and tackle situations where there is competition over water resources more effectively. Overall, the establishment of the new Ministry can be an important step toward a stronger institutional basis for IWRM as discussed in Article II.

Lao PDR is in the process of reforming its water sector, water policies, and legislation which was described in Chapter 3. Earlier water legislation (The Water and Water Resources Law of 1996) (The Government of Lao PDR, 1996) was not elaborated in sufficient detail to enable sound implementation and there were gaps in the legislation. These deficiencies are discussed in Article II.

The Water and Water Resources Law (1996) lists types of water resources and sets out various uses of water (Turner, Pangare & Mather, 2009, 14), but does not set priority to any given type of water use, except to the use of water for electricity production and irrigation, both subject to specific regulations (Philavong, 2011;

WREA, 2008, 23). In spite of the relative abundance of Laotian water resources, water development needs to consider the compatibility between the multiple uses of water. Water development strategies need to be coordinated in order to avoid water conflicts at a national level, between water users, at the international level, and to guarantee the sustainability of social improvements which are also closely linked to achieving the MDGs²³ (which is also a strategic area of the NSEDP), e.g. access to safe drinking water and improved sanitation services. (Boualapha & Philavong, 2011.)

The upcoming edited National Water Sector Policy and National Water Sector Strategy and Action Plan as well as the revised National Water Law aim to reflect IWRM principles better. The new policies and revised law intend to provide a clear perspective for all sector agencies to follow in water resource planning. The National Water Sector Strategy and Action Plan aims to incorporate water resource topics in national and local plans. The aim is to ensure coordination between water resource agencies and national planning agencies regarding water resource planning, including the incorporation of key elements of the National Water Resource Policy and National Water Resource Strategy, and river basin and sub-basin plans into central and local socio-economic development plans. (WREA, 2010b, 3.)

A further field of coordination is the water-related investment review, approval, and monitoring, including concession agreements, environmental and social impact assessment, and water use permits (*ibid.*). By the approval of the new Environmental and Social Impact Assessment (ESIA) Decree, procedures and processes become more clarified, including clearer roles and responsibilities for key agencies and project owners; the role of the Department of Environmental and Social Impact Assessments as the third-party regulating agency at all stages of approval and monitoring will be stronger; and there will be clear requirements for social impact assessments, public involvement, and disclosure (WB, 2009b, 104).

²³ According to UNESCO (2012) and MAF & UNDP (2010) the country is on course to achieve the MDG target of halving poverty by 2015. Between 1991 and 2005, net primary school enrolment rose from 58 to 84 percent. Child mortality indicators are also improving steadily: under-five mortality shows a decrease from 170 to 98 percent per 1,000 live births; and infant mortality has fallen from 104 to 70 percent, which indicate a strong potential for Lao PDR to achieve its MDG targets by 2015. However, Lao PDR is seriously off-track to achieve three MDG targets, which are “reduce hunger by half”, “universal access to reproductive health and “reverse the loss of environmental resources”. Other of the off-track MDGs targets are “universal primary schooling” and “eliminate gender disparity at all levels of education”, reduce maternal mortality by three quarters”, “halve the number of people without safe drinking water in rural areas”, and “halve the number of people without sanitation in rural areas”. For more information: <http://unesdoc.unesco.org/images/0021/002176/217684e.pdf>; http://www.la.undp.org/content/dam/laopdr/docs/Reports%20and%20publications/MAF%20Report_Lao%20PDR_September%202010.pdf

Another important betterment of the environment sector is the Lao Environment and Social Project (LEnS) which supports capacity development for environment and social natural resource management at the national and provincial levels. This project is funded by the World Bank and implemented by MONRE and other related agencies. LEnS supports capacity building in the new Department of Environment and Social Impact Assessment (DESIA), which is under the jurisdiction of MONRE. The capacity of DESIA needs to be built over the long term in terms of staffing, training, and equipment. Measures to increase managerial capacity and to enhance public access to data are also needed. (WB, 2010a, 18.)

5.1.1 Hydropower and Integration

Lao PDR has already developed relatively inclusive domestic environmental legislation to deal with sustainability and environmental conservation issues in its policies and regulations. Articles I and III describe the legal and regulatory frameworks of the hydropower sector. “The projected size of the energy sector with respect to the economy and Government revenue and the estimated speed of growth put pressure on developing institutions, policies, and the fiscal framework to properly use natural resources in the development strategy of the country” (Kemper et al., 2005, 11).

All the stages (selection, design, construction, and operation) of hydropower development projects need to take social and environmental impacts into consideration (see e.g. IHA, 2004). The Government has already developed a great deal of domestic legislation; environmental and social impact assessment (EIA and ESIA) studies, environmental management plans (EMPs), and dam safety regulations to deal with sustainability and environmental conservation issues in its policies and regulations to ensure sustainable hydropower development (see Articles I and III). Moreover, “the Government has promulgated the binding approval of the environmental and social impact assessment (ESIA) and the related Compliance Certificate, as part of the concession acquisition process” (WB, 2010a, 11). All these impact assessment policies and safeguards touch the heart of the need for cross-sectoral integration involving all project stakeholders, and provide a mechanism or tool to achieve this.

Article III studies the Theun-Hinboun hydropower project which is the first Independent Power Project (IPP) in the country. The article explores the role and challenges faced by Asian Development Bank in environmental governance, with a particular focus on hydropower project management and the Theun-Hinboun



Figure 11: Theun-Hinboun dam site in the dry season (photo taken by Sari Jusi in 2004)

case. The implementation of the project points to the problems of accountability, transparency, and environmental sustainability in implementing large-scale infrastructure projects in Lao PDR.

Hydropower development must adopt the dual perspective of integrated water resources management and energy development that takes into account a broad range of social, economic, and environmental issues (WB, 2010b). IWRM, applied as a support system for decision-making, appears particularly appropriate and useful in hydropower development when implemented within a participatory, transparent multi-stakeholder approach (Ganoulis, 2009; World Commission on Dams [WCD], 2000). At the project level, especially in hydropower, the main issue is central and sector-oriented planning and development of large projects. Single-purpose projects may often be less lucrative and efficient than multi-purpose projects, and they often increase adverse effects downstream and upstream of the project (MRC, 2010a, 224). Figure 11 shows the site of the Theun-Hinboun dam in the dry season. As revealed in Article III and in interviews of people living in the area affected by the dam,

aquatic environment (fisheries) has been negatively impacted by inadequate dry-season by-pass flows in Nam Kading, downstream of the dam.

As Articles I and III indicate, the legal and regulatory environment of the hydropower sector has developed greatly, at least when considering the Nam Theun 2 (NT2) hydropower project. Policies related to social and environmental impacts (EIA, SEIA) and resettlement issues have been revised by introducing a national policy (Science Technology and Environment Agency [STEA], 2006). It applies to projects built after 1990 that are larger than 50 megawatts or inundate more than 10,000 hectares (ADB, 2010b, 52). The aim of this policy is to ensure that the principles of social and ecological sustainability are integrated into all large hydropower developments to foster sustainability and equitable benefit distribution and that relevant lessons from the Nam Theun 2 Project are taken into account in other investments (STEA, 2006, 12; WB, 2010b).

The policy promotes an integrated approach to river basin management with multiple projects on a single river. Cumulative impacts are to be recognised and measures required for their mitigation. The main elements of the policy include environmental assessment and management plans, a broad definition of project-affected people and their right to sustainable development options. Moreover, the policy includes watershed management and conservation efforts including offset and adaptive management plans, free prior and informed consultation, disclosure of project consultation reports, impact assessments, mitigation plans, etc. Finally, the policy insists that this all is carried out with oversight from third party agencies²⁴ and that project revenues cover the cost of environmental and social safeguards through the Environmental Protection Fund (EPF) established in June 2005. The establishment of the first Watershed Management Protection Authority in Lao PDR is also an accomplishment of the Nam Theun 2 project. (MRC, 2009, 10; STEA, 2006, 12–16).

However, full implementation of the policy is still a big challenge. WREA (now MONRE) and the Department of Environment (DOE) (now MONRE) have a limited amount of qualified staff and appropriate legal and institutional instruments are still lacking. “There are areas that need clear regulations and institutional mechanisms such as watershed management, revenue sharing, and mandatory contributions to the Environmental Protection Fund. While the policy positively addresses the issues

²⁴ In case of NT2, the independent monitoring agency shall report to the both the government and the Nam Theun 2 Power Company (NTPC) on its findings. The NTPC shall be responsible for funding the costs associated with appointment of the independent monitoring agency. Presently, the government has engaged Halcrow, an international consulting firm, as the independent monitoring agency for the environmental and social measures. (ADB, 2010b, 97.)

of consultation and disclosure, their implementation remains a concern”. (ADB, 2010b, 53.)

The aim of the Government is to evaluate the lessons learned during NT2 and to replicate them in future projects so that the best social and environmental programs are put in place to effectively manage impacts and to improve transparency and participatory approaches (see e.g. Porter & Shivakumar, 2011). As the former Minister of WREA, Mrs. K. Pholsena (personal communication, August 26, 2010), stated “*We have now embarked, we have first learned from dealing with Nam Theun 2, been working with World Bank, IFI in introduction and implementation of safeguard policies, the process and everything which has been mainstreamed into existing regulatory framework, so we need to really master this process of EIA, IEE as well as we have also introduced this strategic environmental assessment as well as transboundary.*” Nam Theun 2 was voted the top Hydroelectric Power Project of the year 2011 in a Global Energy Magazine poll.²⁵ However, the ability to replicate the NT2 project procedures and experiences is questioned by other stakeholders due to high standards of the project’s social and environmental safeguards and the low capacity of the Lao electricity sector and the Government to implement these safeguard policies (Porter & Shivakumar, 2011, 8; V. Viraphong, personal communication, August 23, 2010). The project has also raised criticism among many NGOs due to the inadequate design of environmental and social mitigation and compensation measures.

While Lao PDR has adopted many measurements to protect the environment, increase in hydropower supply to meet future energy demand poses challenges for the environment and affected people. The division of responsibility among agencies is still somewhat unclear, human and financial resources are inadequate, and regulation is inconsistent as Articles I and III have revealed. Major weaknesses still remain especially in the establishment and enforcement of legal and regulatory instruments. One of the biggest worries is the capacity of the Lao government (MEM, MONRE) to sufficiently assess the social, environmental, economic, and cumulative impacts of proposed hydropower projects.

²⁵ The poll results were announced on the magazine’s website, revealing that its readers, most of them managers from top international energy companies, voted the Nam Theun 2 hydroelectric power project in central Laos as the number one hydroelectric power project in the 15-category renewable energy section. The selection of the award winners was based on votes polled in the magazine’s online survey, which opened in January, 2011. More than 1 100 professionals from over 700 companies spanning 73 different countries, nominated the winning projects. The magazine is one of the leading publications in the energy industry and focuses on all areas of the business, including oil and gas, coal, nuclear power, renewable energy, power and utilities and the transport sectors. <http://www.globalenergymagazine.com/2011/04/and-the-winners-of-the-2011-global-energy-magazine-readers%E2%80%99-poll-awards-are%E2%80%A6/>

Another recognised problem is the issue of hydro concessions, discussed in Article I. Concessions have been directly negotiated and awarded in the absence of competition and set procedures for Built-Operate-Transfer (BOT) concessions (Turner, Pangare & Mather, 2009, 18; WB, 2010a, 7). “The Government recognises that it could boost its revenues significantly if it were to grant concessions for large hydropower projects on the basis of a competitive and transparent bidding process, rather than depending upon the existing developer and investor-driven system” (ADB, 2010b, 7). The review process for proposals and concession contracts and the managing and monitoring of concessions within the Department of Energy Development and Promotion and Ministry of Energy and Mines (MEM) need to be strengthened. This is also the case with collaboration on basin-wide IWRM-based planning approaches between MEM and MONRE (former WREA) and the institutionalisation of Strategic Environmental Assessment (SEA) approaches within MEM and MONRE (former WREA) (Turner et al., 2009, 18). Department of Energy Promotion and Development (DEPD) has recognised the need to strengthen the capabilities of its personnel to negotiate project agreements (such as power purchase agreements and concession agreements) in all relevant disciplines, including legal, regulatory, commercial, financial, technical, environmental, and social matters (ADB, 2010b, 7).

EIA still frequently fails to influence decision-making in the hydropower sector, as shown by Article III and the case of the Theun-Hinboun dam (see Figure 11). Article I argues that the adequacy and quality of EIAs prepared by consultants for hydropower projects are often questioned. For example, the commencement of the much debated and controversial Xayaburi dam²⁶, a planned hydro project in Northern Laos, has been delayed due to weak EIA and social studies. The project has raised a lot of criticism from Vietnam, Thailand, and Cambodia. Expert panels as well as environment and community groups criticise the lack of information on key potential dam impacts (World Wildlife Fund²⁷ [WWF]). These impacts may affect the food supplies and livelihoods of millions of people (see e.g. International Rivers Network²⁸ [IRN]; Oxfam Australia²⁹; Towards Ecological Recovery and Regional

²⁶ http://www.poweringprogress.com/index.php?option=com_content&view=article&id=325:xayaboury-mekong%201260mw&catid=130:planned-projects&Itemid=130

²⁷ http://wwf.panda.org/wwf_news/?200310/Aspiring-consultants-should-commit-to-best-practice-review-of-Mekong-dam

²⁸ <http://www.internationalrivers.org/en/2011-4-17/outrage-over-secret-xayaburi-dam-construction>

²⁹ <http://www.oxfam.org.au/explore/infrastructure-people-and-environment/save-the-mekong/damming-the-mekong/xayaburi-dam>

Alliance³⁰ [TERRA]; Center for Water Resources Conservation and Development³¹ [WARECOD]).

Moreover, NGOs and international financing institutions have raised concerns that Chinese hydropower financiers and developers active in the entire Mekong basin and particularly in Lao PDR generally lack safeguard policies on environmental and social issues and do not necessarily adhere to internationally accepted standards and guidelines (Middleton, 2008; Osborne, 2004, 40–44; WCD, 2000, 188). Because the benefits and negative impacts are unevenly distributed, proper benefit sharing mechanisms and mitigation measures become imperative for the sustainability and stability of development in the hydropower sector (MRC & ICEM, 2010; WB, 2010a). “It is the poor who will bear most of the costs and see few of the benefits, except through trickle down economic growth” (Costanza et al., 2011, 41).

As is shown in Articles I and II, capacity for implementing environmental and social safeguard policies is still lacking. Numerous interviewed Government officials pointed out the need for capacity building in this area. “Especially at the local level, authorities do not possess sufficient control mechanisms, management systems and procedures, qualified staff, adequate financial resources, or environmental awareness needed to undertake and enforce existing legislation” (United Nations, 2001, 17). One of the findings of Article III is that financiers, in this case the Asian Development Bank and private companies need to improve transparency as well as information sharing mechanisms and processes, including participatory processes and compensation mechanisms. This also applies to the Government organisations responsible for hydropower development.

There is a need for better strategic assessment of hydropower development options for Lao PDR (ADB, 2010b; Lawrence, 2008, 4) and for the use of hydropower development revenues to poverty reduction activities. “The collective benefits can be maximised if individual hydropower investments are assessed through a river basin approach (to understand cumulative hydrological, environmental, and social impacts as well as to increase the economic potential for any given level of impacts) and through an energy sector development strategy” (World Bank, 2010c, 11). The Mekong River Commission (MRC) has commissioned a Strategic Environmental Assessment (SEA) of all the proposed mainstream projects including the effects of dams built and planned upstream in China. The SEA seeks to identify potential opportunities and risks as well as the contribution of proposed projects to regional development by assessing alternative mainstream Mekong hydropower development

³⁰ http://www.terraper.org/mainpage/index_en.php?langs=en

³¹ <http://www.warecod.org.vn/en-US/News/news/2011/05/285.aspx>

strategies. (MRC & International Centre for Environmental Management [ICEM], 2010.)

“Politics is the predominant process determining how water (among other) resources is shared between potential uses, and the balance between environmental, economic and social values of water” (Butterworth et al., 2010, 74). Although Lao PDR has established new policies and laws related to the protection and equitable use of water, and made efforts to mainstream and integrate IWRM principles to its water policies, it appears that hydropower development ‘rules’ the use and management of water resources to a great extent. The drive to vigorously develop hydropower downplays the multi-sectoral approach and water use for other sectors – water for people, nature, and food (See Figure 1 showing IWRM and its relations to sub-sectors) as Articles I, II and III indicate.

As Article I identifies, major problems of the Lao hydropower sector relate to capacity and institutional environment, such as insufficient quality of environmental and social assessments, ineffective regulatory framework, a lack of transparency, and the failure to conduct comprehensive consultations with all stakeholders. These issues came strongly up in many key interviews and FREPLA2020 project workshops when the Lao officials from different Ministries expressed their concerns about these challenges and problems. Article I also describes some problems related to hydropower financing mechanisms in Lao PDR. “The opportunities and challenges of hydropower development are complex, and ultimately depend on the resources, skills, and will to invest responsibly, with due regard to the economic, environmental, and social aspects of sustainable development” (WB, 2009a).

Data and information management in IWRM

“The proponents of integrated water resources management concept have been conspicuous by the neglect of the data availability, reliability and accessibility issues” (Biswas, 2008, 12). The Asian Development Bank (2007a) has also raised serious questions regarding the paucity and reliability of data on all aspects of water-related issues in Asian developing countries. It is simply not possible to plan, develop, and manage water resources in any country on a sustainable long-term basis without reliable and updated data on physical as well as social, economic, and environmental factors. Equally, it is not enough to collect data that are necessary and reliable; data must be readily accessible to the people who need them, ranging from national and international organisations to research and academic institutions, NGOs, and the civil society in general. (ADB, 2007a, 34.)

In other words, the implementation of the IWRM paradigm requires reliable and accessible water-related data as highlighted in Articles I, II, and III. It is critical for effective water development and management in Lao PDR that adequate and reliable data are available at national, regional, and local levels, depending on the specific water activities that need to be carried out (see e.g. WEPA & IGES, 2012). “Without good data, the progress and performance of policies, programs, or projects cannot be monitored adequately” (ADB, 2007a, 34). Currently, lack of reliable information and poor access to information marks the water sector data in Lao PDR.

In general, the performance of the water resource information system is poor and inefficient, as the responsibilities of agencies for data acquisition and management are poorly defined. “No organisation is effectively coordinating and compiling data nationally and no central source (database) for water resources data exists. Water resources data held by different agencies is often dissimilar in terms of quality, format, and other characteristics”. (ADB, 2010b, 69.) In particular, stakeholders at the provincial level rarely have access to water-related information that is specific to their village or town. Thus, funds for data collection and management need to be sustainable and secured (S. Komany, personal communication, August 20, 2010) and the same applies to effective dissemination of accessible data. In Lao PDR, the need to collect groundwater-related data is obvious and it has been identified in many workshops and interviews of the FREPLA2020 project.

To overcome these data problems, the National Water Resources Strategy and Action Plan (NWRSP) aims to develop a coordinated and effective water resource database as well as a related information and analysis system to support decision-making. The Department of Meteorology and Hydrology under WREA (now MONRE) will be responsible for these tasks. The strategy also aims to increase staff capacity in data collection, management, model application, and interpretation of modelling results. One aim of NWRSP is to strengthen regional and international coordination by approving and participating in regional and international water management partnerships, agreements, treaties, and forums. (WREA, 2010b, 3, 4.) As regards knowledge management and knowledge sharing in the water sector, Lao PDR has joined the Network of Asian River Basin Organisations (NARBO³²).

³² NARBO is the Network of Asian River Basin Organisations. Announced at the 3rd World Water Forum in March 2003, NARBO was officially established in February 2004 to promote integrated water resources management in the monsoon areas of Asia. The goal of NARBO is to help achieve IWRM in river basins throughout Asia. The objective of NARBO is to strengthen the capacity and effectiveness of RBOs in promoting IWRM and to improve water governance through training and exchange of information and experiences among RBOs and their associated water sector agencies and knowledge partner organisations. More information available at: <http://www.narbo.jp/>

Furthermore, the Global Water Partnership Lao³³ was established in September 2003.

Articles I–IV jointly reveal the need for *capacity assessment and building* at all levels of water organisations and water actors. As the former Minister of WREA, Mrs. Khempheng Pholsena, (personal communication, August 26, 2010) stated, “*So water resource ... things are happening but capacity building is the most pivotal challenge and task.*” Many developing countries are developing an integrated approach to manage their water resources. They are now climbing the so-called management ladder (SIWI, 2001) from a situation of comparatively easy access to water resources towards the complex management of increasing demand. The need for capacity support to facilitate the development is obvious. There is a need to develop expertise on analysing the factors influencing water demand (SIWI, 2001, 28). Lao PDR is also facing the complex environment of managing increasing demand of its water. “This state can be described as a transition stage where the emphasis is on harnessing available water” (Molden & Sakthivadivel, 1999 in Bandaragoda, 2006, 5). The Government must also assess the capacity to equip water and other specialists to implement the full range of activities for IWRM as recommended in the Dublin Principles (UN, 1992b).

Another important aspect is to evaluate *risk factors* for IWRM. According to Global Water Partnership (2000), “relatively little attention has been paid to the systematic assessment of risk mitigation costs and benefits across water use sectors and to the consequent evaluation of various risk trade-off options. Variations in water flows and groundwater recharge, whether of climatic origin or due to land mismanagement, can add to drought and flood events, which can have catastrophic effects in terms of large scale loss of human life and damage to economic, social, and environmental systems. Water pollution creates another set of risks, affecting human health, economic development, and ecosystem functions. Economic risks are also important in water resources management and development due to the often large-scale and long-term character of the investments required. Political instability and change represents yet another important risk factor for IWRM”. (Ibid., 11.)

World Bank (2010b, 5) pinpoints that “risks associated with large-scale natural resource development may exist at any level from the international sphere to local communities, and these risks need to be identified and managed at all stages. Social risks can be reduced by using benefit-sharing arrangements at the local level. Environmental risks can be avoided by selecting quality investors, making environmental impact assessments (EIAs) obligatory, and effectively enforcing

³³ For more information, see http://www.gwpsea.org/index.php?option=com_content&view=article&id=64:cwp-profile&catid=22:country-water-partnership-profile&Itemid=122

existing environmental laws and regulations. Risks related to project performance can be lowered by better monitoring the implementation of projects”. (Id.)

Good governance, including public participation and involvement, transparency and accountability, capacity building and institutional strengthening particularly at the local governments and organised civil society groups are keys to reducing risk (Department of Sustainable Development [DSD], 2011). Risk assessment and risk management require capacity building in many aspects and these requirements have been identified in Lao PDR during the many workshops and interviews of the FREPLA2020 project. The need to analyse possible risks related to climate change impacts was seen particularly essential by many Government officials.

5.1.2 Integration at the Regional Level

Management of international watersheds will greatly increase in importance. Cross-border co-operation is one important aspect and level of IWRM. Articles I and II touch this issue mostly from an environmental policy perspective in a situation of increasing demand for water and energy (hydropower). Articles I–IV accentuate the need for a comprehensive institutional and regulatory framework for the Mekong River which can ensure socially equitable development and the proper use, management, and conservation of water resources for different water use sectors. Therefore, a high priority should be given to the preparation and implementation of integrated management plans, endorsed by all affected governments and backed by international agreements (see e.g. Bach et al., 2011; Jønch-Clausen, 2004; United Nations, 1992b). In the Mekong region this is exemplified by the Mekong River Commission (MRC), through which the four Lower Mekong Countries – Lao PDR, Vietnam, Thailand, and Cambodia – strive to co-ordinate the development of the basin. The Mekong River Commission emphasises the coordinated management of land and water through their adopted IWRM Strategy. (Hassing et al., 2009, 9.) The MRC has adopted IWRM using the definition of the Global Water Partnership (GWP, 2000, 22) discussed in Chapter 1. Applying the principles of IWRM, the MRC Strategic Plan 2011–2015 calls for a stronger integration of the various programmes within the Secretariat (MRC, 2011b).

A 1995 agreement mandated that the Mekong River Commission shall develop a Basin Development Plan (BDP) with the objective of promoting the coordinated development and management of water and related resources at the basin level using the principles of Integrated Water Resources Management (IWRM). “The first phase of the BDP Program (2001–2006) focused on establishing processes and a framework

for participatory planning and improving the knowledge base and tools for water resources development”. (Costanza et al., 2011, 1.) The second phase (2007–2010) of the BDP (BDP2) formulated and assessed basin-wide development scenarios, which facilitated the establishment of a shared understanding of development options in the LMB. BDP2 provides an integrated basin perspective against which national plans and proposed projects can be assessed to ensure an acceptable balance between economic, environmental, and social outcomes in the Lower Mekong Basin. It will provide a so called ‘development space’ within which the LMB countries can plan and work. (MRC, 2009, iii.)

An additional planning tool to address the environmental issues surrounding the eleven planned mainstream dams is Strategic Environmental Assessment (SEA), as is discussed in Article I. “Commissioned by a program within the MRC, the SEA provides detailed analysis on the potential impacts of the dams, thus complementing the BDP in providing a basis for discussion and negotiation of mutually beneficial levels of water resources development and their associated levels of transboundary environmental and social impacts” (Costanza et al., 2011, 1).

The Mekong River Commission (MRC), the government of Lao PDR, the government of Cambodia, and the World Bank are also preparing a regional project called Mekong Integrated Water Resources Management Project or M-IWRM³⁴ to be implemented over a period of 5 years (2011–2015). The project is designed to establish key examples of integrated water resource management (IWRM) practices in the Lower Mekong Basin (LMB) at the regional, country, and sub-national levels. The Project has three components: (1) Regional Water Resources Management aiming to promote the regional cooperation on IWRM and trans-boundary issues, (2) National Water Resources Management designed to build technical and management capacity of the Water Resources and Environmental Agency (WREA, now MONRE) in Lao PDR, and (3) Improved Floodplain and Aquatic Resources Management in Regionally Significant Areas designed to help improving the management of floodplains and wetlands/fishing grounds. “The development objective of the project is to establish key examples of integrated water resources management practices in the LMB at the regional, national, and sub-national levels, thus contributing to more sustainable river basin development in the Lower Mekong.” (MRC, 2010a, 2.)

China and Myanmar are not full members of the MRC and this can constrain the operations of MRC (see e.g. Osborne, 2004) and the implementation of IWRM. However, partnerships with the MRC Dialogue Partners (China and Myanmar)

³⁴ More information available: <http://www.wrea.gov.la/wrea/index.php/en/the-news/information/367-initial-environment-and-social-examination-iese>

have been considerably strengthened and raised to a higher level of constructive and active cooperation. “Over 14 years, China and Myanmar have demonstrated an increasing commitment to cooperation, including the exchange of more data and information on the status of upstream developments and joint capacity building activities”. (MRC, 2010b, 6; MRC, 2010c.) This issue was also raised during many FREPLA2020 project interviews with MRC officials.

5.2 Decentralisation

“Political pressure probably drives most decentralisation efforts in many developing countries. But whatever its origins, decentralisation can have significant repercussions in resource mobilisation and allocation, and ultimately in macroeconomic stability, service delivery, and equity” (Litvack, Ahmad & Bird, 1998, 1). “Decentralisation (in its various forms and degrees) holds out the promises of reduced financial and transaction costs, increased flexibility and efficiency, local control, and accountability” (Mody, 2004, 45; see also Kemper et al., 2005, 62). Decentralisation and participation go hand in hand. Decentralisation is a way to encourage involvement in development and other public affairs. To implement IWRM, decentralisation is required since well-functioning organisations and institutions need to exist and be located close to the resource management in question, which for its part refers to the subsidiarity principle of IWRM and (International Conference on Water and the Environment [ICWE], 1992) also to the EU Water Framework Directive (EU, 2000). “Stakeholder involvement and public participation are important tools to achieve the goals and objectives towards decentralisation set out by water management reforms” (Pahl-Wostl et al., 2006).

Decentralisation is not easily defined. It takes many forms and has several dimensions. Decentralisation is a process of transformation from a governance structure in which power is concentrated at the central or national level to one in which the authority to make decisions and implement them is shifted to lower level governments or agencies (Kemper et al., 2005, 57; Mody, 2004, 2). Perhaps the best known general definition of decentralisation is by Rondinelli (1981, 137): “*The transfer of responsibility for planning, management, and resource-raising and allocation from the central government to (a) field units of central government ministries or agencies; (b) subordinate units or levels of government; (c) semi-autonomous public authorities or corporations; (d) area-wide regional or functional authorities; or (e) Non-Governmental Organisations/Private Voluntary Organizations.*”

One widely used distinction is made between deconcentration, delegation, and devolution (Rondinelli, 1981; Rondinelli, McCullough & Johnson, 1989). *Deconcentration* occurs when the central government disperses responsibilities for certain services to its regional branch offices. This does not involve any transfer of authority to lower levels of government and is unlikely to lead to the potential benefits or pitfalls of decentralisation. In contrast, the central issue for both delegation and devolution relates to the balancing of central and local interests. *Delegation* refers to a situation in which the central government transfers responsibility for decision-making and administration of public functions to local governments or semiautonomous organisations that are not wholly controlled by the central government but are ultimately accountable to it. These organisations usually have a great deal of discretion in decision-making. *Devolution*, a more extensive form of decentralisation, refers to a situation in which the central government transfers authority for decision-making, finance, and management to quasi-autonomous units of local government. Devolution usually transfers responsibilities for services to municipalities that elect their own mayors and councils, raise their own revenues, and have independent authority to make investment decisions. (Rondinelli, 1981; Rondinelli, McCullough & Johnson, 1989.)

Decentralisation within river basins is not a simple or monolithic concept. In different contexts, the specific rationale for decentralisation also guides its appropriate form. “First, administrative decentralisation delegates authority to lower levels of government, from federal to state and from state to municipal authorities. Second, devolution may include the establishment of formal water users’ associations that participate in official monitoring and regulatory functions. In this form of participation, water users play the role of protecting their own rights. Third, in addition, participation can be more far reaching, as, for example, when stakeholders are engaged directly in the process of managing resources and delivering services – Ostrom (1996) refers to such participation as ‘coproduction.’” (Mody, 2004, 8, 9.)

The second Dublin principle (ICWE, 1992) states that decisions should be made at the lowest appropriate level, with full public consultation and involvement of users in the planning and implementation of water projects. Whether local governments are able to play their role in water management and respond to IWRM depends greatly on the surrounding governance system that determines its mandates and responsibilities. Capacities and available resources are other influencing factors. The system varies according to the degree of decentralisation a country has established and other factors, such as historical background, colonial heritage, and cultural traditions. Local government must, therefore, have a good comprehension on the governance structures within which they must work, as these not only define their

opportunities in IWRM, but also their limitations. (Philip et al., 2008, 16; Smits, Bustamante & Butterworth, 2006, 8.) Mody (2004) points out that the case for decentralisation against central control is not unambiguous. “Central control offers distinct advantages in certain circumstances; there are tradeoffs and tensions to be reconciled (e.g., economies of scale versus local monitoring; integrated management or inter-regional equity versus local control).” (Mody, 2004, 45.)

“In addition to facilitating inter-sectoral integration, River basin organisations (RBOs) also provide a means of decentralising management authority from national governments to the basin or sub-basin level where specific local issues and problems can be taken into account and where institutional accountability is greater” (Xie, 2006, 7). Article II discusses the subsidiarity principle and the establishment of RBOs in the Laotian context. “Successful decentralisation depends on negotiated voluntary arrangements, conflict resolution mechanisms, and the institutions necessary to support them” (Mody, 2004, 1). In recent years, the trend has been to give the private sector a larger role in managing, operating, and maintaining water and wastewater systems. This has actualised more in developed countries (e.g. France, England) whereas developing countries are lacking necessary skills within the private sector to operate, maintain, and develop the systems (UNESCO-WWAP, 2003, 380, 381). “The private sector can play a role in producing water services and should be allowed to bring its technical expertise and efficient management practices into areas where a central government has struggled to provide sustainable service” (Xie, 2006, 53).

Public-private partnerships³⁵ can bring about substantial benefits but can also be seen controversial as the public interest may be extended to be the responsibility of private sector. The term “public-private partnership” is particularly malleable as a form of privatisation. It is defined broadly as “an arrangement in which a government and a private entity, for-profit or nonprofit, jointly perform or undertake a traditionally public activity” (Savas, 2005, 1). “Privatisation can be categorised in three modes: (1) delegation, where government retains responsibility and oversight but uses the private sector for service delivery, for example, by contracting for services, or outsourcing; (2) divestment, where government relinquishes responsibility; and (3) displacement, where the private sector grows and displaces a government activity” (Savas, 1990 in Savas, 2005, 2).

There is a need for co-design or co-management/co-regulation between government and private sector due to the increasing competition for scarce

³⁵ Public-private partnerships can have several forms, like divestiture of assets, concessions, Build-Operate-Transfer (BOT) and the Build-Own-Operate-Transfer (BOOT) schemes, and service contracts. For more information, see <http://www.unesco.org/water/wwap/wwdr/pdf/chap15.pdf>

development assistance resources in developing countries as well as the growing pressure for public sector reforms (often synonymous with cuts in the size and budget of the public sector) (GWP, 2000, 40). Co-regulation aims to make best use of the combined resources of the state and the private sector in achieving regulatory outcomes (through the formal sharing of regulatory responsibility). A problem in many developing countries is the lack of capacity and experience to develop an adequate regulatory system. “Public-private partnerships, public participation, economic, regulatory or other instruments will not be effective unless the political will exist and broader administrative systems are in place”. (UNESCO-WWAP, 2003, 381.)

Moriarty et al. (2010) explain that fiscal decentralisation often seems to lag far behind the decentralisation of functions and people. “The main limitations to action is lack of access to finance, with decentralised authorities absolutely reliant on financial flows from the national level that are often earmarked and over which they have very little control” (Moriarty et al., 2010, 134).

5.2.1 Some Characteristics of Lao Decentralisation Process

Decentralisation has for many years played a central role in different countries’ attempts to reform their public sectors. “Decentralisation of planning – an important trend also throughout the Lower Mekong Region – has led to a revitalisation of local government and meant new opportunities for partnerships between communities, private enterprises, and NGOs who are able to mobilise additional resources and capacity. At the same time decentralisation has been a problem due to lack of capacities at local level”. (Poppe, 2004, 20.) Despite the bureaucracy involved in decentralisation processes, Lebel, Garden and Imamura (2005) see hope that innovative dialogues could bring diverse stakeholders from different levels together and in doing so help produce the kind of political institutions and norms that are the core of good governance.

Decentralisation is among the national priorities also in the development programs of Lao PDR (Government of Lao PDR, 2010; 2004). The decentralisation process, considered a part of the mainstreaming development strategy and included in many of the government programmatic documents, is expected to contribute to a more appropriate, sustainable, and equitable development approach in which each stakeholder is fully involved in a real ownership building process in the country (Bertinelli, 2011, 16). The decentralisation process is nowadays ongoing

mainly according to the Governance and Public Administration Reform³⁶ (GPAR) supported by the UNDP. “In principle, Lao PDR operates a deconcentrated fiscal system, but in practice fiscal management is highly decentralised – provinces having considerable autonomy in the management of their affairs, independent of higher levels of government” (International Monetary Fund [IMF], 2006, 8, 9).

The main feature of the Lao system is based on a balance between vertical and horizontal lines. The vertical line comprises the central ministries and their field offices at the provincial and district level. The horizontal line is made of offices, committees, and mass organisations directly under the governor and the district chief. Thus any field office responds to the vertical line (central ministry) and the horizontal line (provincial governor and district chief). The village is considered self-administered, headed by an elected village chief/head. The villagers elect the chief from candidates approved by the district within a ‘guided process’ every two years. The village, through its chief, is a part of the civil administration. (Poppe, 2004, 37; UN, 2005, 8, 9.)

“The country’s history of central-local relations³⁷ has three well-defined periods and a recurrent pattern of decentralisation and re-centralisation” (Martinez-Vazquez, Gomes & Yao, 2006, 3). In 1986, a “New Economic Mechanism” was introduced, which reflected an overt policy of decentralisation and led to a substantial devolution of power to the provinces (IMF, 2006, 9). “By triggering a collapse in Government revenues and a large increase in the budget deficit, this reform led to a period of severe macroeconomic instability. To address these problems, a new Constitution was introduced in 1991 which sought to reassert central control over fiscal management. However, this attempt to recentralise did little to reduce the authority of the provincial governors. In 1991 Government vigorously moved to regain control by reinstalling a centrally controlled administration” (Martinez-Vazquez, Gomes & Yao, 2006, 3).

Decentralisation has again arisen to the development agenda in the current Millennium. Local administrative functions have been defined in three sets of texts: Instruction 01/PM from the Prime Minister and Recommendation 128/SPC issued by the State Planning Committee (now the Committee for Planning and Cooperation), both dated 11 March 2000, and Recommendation 475/MF, issued on 22 March 2000 by the Ministry of Finance (Martinez-Vazquez et al., 2006, 4;

³⁶ More information about the program available at UNCDF page: <http://www.uncdf.org/english/countries/laos/index.php>

³⁷ For example Martinez-Vazquez, Gomes & Yao, (2006) <http://aysps.gsu.edu/isp/files/ispwp0622.pdf> and IMF, (2006) <http://www.imf.org/external/pubs/ft/scr/2006/cr06398.pdf> provide a brief history of decentralisation patterns in Lao PDR.

Winter, 2002, 7). The stated objective of the Prime Ministerial Decree 01 (2000) was to “establish provinces as the strategic unit, districts as the budget planning unit and villages as the implementing unit.” “The decentralisation initiative was aimed at making districts more self-financing, giving them greater incentives to collect revenue and better manage their expenditures, and making budget formulation more participatory” (IMF, 2006, 9). The tasks of districts are to oversee budgets, provide technical support to villages, and direct relevant information to the province. Overall strategic planning and guidance will fall under the responsibility of provinces. According to this framework, villages will make on-the-ground decisions about policy implementation and localised planning issues. (The Government of Lao PDR, 2003b.)

Following the Prime Minister’s Decree 135/PM 2002, local development planning is undertaken at provincial, district, and village cluster (Kum Ban) levels. “A Kum Ban is a cluster of villages grouped together at the sub-district level for planning purposes”. (Poppe, 2004, 41.) Kum Ban development planning will be used alongside the conventional, bi-annual and five year planning which enable local people to better express their specific needs. Developing 500 to 600 Kum Bans is a costly process, but it has also been seen as a way to prevent young people from migrating to cities by developing services of the villages (B. Sisouphanthong, personal communication, August 24, 2010.) “In theory, the main purpose for the Kum Ban system was to find a way to deepen local people’s participation in agriculture and other development activities, and strengthen local voices within district planning processes.” In reality, it is difficult to estimate how the Kum Ban will really improve decentralisation and people-centred policies. (Bertinelli, 2011, 17.) All in all, it must be kept in mind that the abovementioned ministerial instructions and recommendations are not endowed with a great degree of legal authority (Winter, 2002, 8).

In Lao PDR, decentralisation has mostly occurred within specific sectors – water, agriculture, and forestry (Poppe, 2004). Poppe (2004) and Winter (2002) see that “decentralisation,” as described in Lao PDR, can more accurately be described as deconcentration based on the transfer of function but not the transfer of power, with local administrations being held more or less accountable to central government. There are no genuinely elected bodies at the local level, and local administrations are not (officially) downwardly accountable to local citizens – although they are, to a limited degree, accountable to local Party constituencies. (Poppe, 2004, 39; Winter, 2002, 32.)

Any meaningful attempt to improve local governance in Lao PDR would need to concentrate on establishing mechanisms for a degree of downward accountability and making upward accountability rather more formal and coherent. Increasing

the degree to which local public sector management is transparent would be fundamental to any movement towards greater accountability. (Ibid.) Moreover, “dialogue about local governance (related to decentralisation and participation including concepts such as accountability and transparency) needs to start with agreement on a mutually understood “language” shared with officials, ordinary citizens and donor community” (Winter, 2002, 33).

There are undeniable and severe weaknesses in the capacity (human and physical) of local administrations and communities to manage decentralised planning, budgeting, and service delivery (Government of Lao PDR, 2003, 30). Attempts to decentralise planning and implementation need to be coordinated, and substantive efforts should be extended to improve local level institutional capacity (ADB, 2000b, 6), which is also highlighted in Article II. As a result of decentralisation, the need for institutional strengthening and capacity building in the water sector and hydropower-related organisations is increased especially at provincial and local levels. Educational levels are relatively low, particularly in the districts and villages, resources are scarce, and organisational constraints are considerable particularly with regard to coordination. Improving local governance would require building capacity and management skills. (Winter, 2002, 33.) This is also the case concerning the capacities of district and provincial authorities as well water user groups as discussed in Article IV.

Mobilising coordinating river basin committees in river basin management and water user groups and irrigation associations (discussed in Articles II and IV) are recognised methods for the decentralisation of water management in Lao PDR. These are discussed in the following. In addition to WUAs, “provincial water supply agencies and village water supply management committees constitute the local agencies and communities to which water service provision is being transferred” (WRCCS, 2005, 73).

5.2.2 Decentralisation at the River Basin Level

Article II describes the process of developing integrated water management approaches to the Lao water sector and the major problems and challenges related to it. The article analyses the institutional environment and legal frameworks and discusses a quite new project of developing river basin organisation at the Nam Ngum River Basin. In Lao PDR the aim is to devolve water planning at a river-basin level, and river basin organisations (Nam Ngum River Basin) are being tested to assess the appropriateness of this approach. Provincial WREA (now MONRE)

agencies are expected to receive greater responsibilities for water resource planning and management, and management of irrigation schemes has been appointed to the farmer level (see e.g. WRCCS, 2005).

As it is widely recognised, the river basin or catchment area is commonly considered as the most appropriate unit for water resources management or, more generally speaking, regional planning (Bandaragoda, 2000, 12, 13; EU, 2009, 11; GWP, 2000; Ramsar Convention Secretariat, 2010; 2007; UNESCO-WAPP, 2003, 380). However, there are often cases where it is appropriate to work at smaller sub-basin scale or at a regional multi-basin level (GWP, 2009c, 1). Moench, Dixit, Janakarajan, Rathore, and Mudrakartha (2003) have argued that it could be hydrologically more appropriate to allocate and manage water at a sub-basin, watershed, or even administrative unit level instead of hydrological units (river basins, aquifers). They think that “the key is to think systemically and to define the boundaries of analysis or management at scales where hydrologic, social, economic, and institutional conditions enable effective action in response to specific needs”. (Moench et al., 2003, 8–9). As regards groundwater management, “the hydrological cycle calls for integration between surface water and groundwater management” (Jøynch-Clausen & Fugl, 2001, 505).

“The promise of decentralisation in the context of river basin management could contribute significantly to improved efficiency in water use, greater equity in allocation of water, and the preservation of delicate ecosystems” (Mody, 2004, 29). Water resource planning and management is a multidisciplinary process and therefore has to be promoted as a collaborative framework among all the relevant agencies operating nationally and those involved within the river basin itself as well as local communities (Ramsar Convention Secretariat, 2007, 11). “Basin-level governance – allowing stakeholders articulate their interests, share information, communicate and bargain, and take collective decisions – is essential to the ability of water users to operate at multiple levels of action, which is a key to sustaining successful resource preservation and efficient use (Ostrom, 1990)” (Dinar, Kemper, Blomquist & Kurukulasuriya, 2006, 10).

The river basin or watershed organisation (committee or council) approach is generally recommended to establish integrated water resources management strategies and to plan for water resources assessments nationally and sub-regionally (GWP, 2000). As a result of globalisation and integration, river basin organisation approach may prove to function in solving problems related to water resources management of transboundary river basins in the sub-basin level. This can provide a way to enhance sub-regionally coherent legislation and water policies (Garcia, 2005).

It is now accepted policy in all LMB countries that watershed and river basin management must consider economic, ecological, and social dimensions/functions through broad consultation with all stakeholders (Bach et al., 2011, 4, 14). River Basin Committees will be established to coordinate water resources planning and management and to advise the Government on water resources management in selected river basins and sub-basins in Lao PDR.

There are twelve major river basins in the country. “The Nam Ngum River Basin (NNRB) was selected the first project where the IWRM concept is initiated due to important existing and planned water sector investments in the area as well as its proximity to Vientiane” (ADB, 2005, 190). The Nam Ngum River Basin is considered a multi-purpose reservoir (Boulapha & Lyle, 2011, iii; Claridge, 1996, 73). Figure 12 shows a view of the Nam Ngum Reservoir.

The project was undertaken between 2002 and 2010. Integrated water resource management plans will be prepared in five priority river basins and sub-basins (WREA, 2010a, 4; WREA, 2010b, 3). In June 2010, the Government passed Decree No. 293 to enable the establishment of river basin committees which paved the way for the formation of the Nam Ngum River Basin Committee which is not



Figure 12: Nam Ngum Reservoir (photo taken by Sari Jusi in 2004)

yet established. As the first step, the Nam Ngum River Basin Secretariat has been established. (Bach et al., 2011, 24.) The Government also aims to establish River Basin Committee to Nam Theun-Nam Kading supported by Lao Environment and Social Project (LEnS) and World Bank (Bach et al., 2011, 24).

Through NNRB project's integrated catchment management and livelihood/poverty approach combined together, the project is considered by ADB (2005) as highly relevant to current Government development policies and strategies. According to the ADB's evaluation (2005) of the NNRB Project, failure to establish IWRM in the NNRB through the project may make further development in watershed planning and management more difficult. On the other hand if the project succeeds in developing viable mechanisms and coordination systems, it is likely that IWRM will be extended to other river basins over time and it will be therefore a valuable stepping stone to sound water resources management in the Lao PDR. (ADB, 2005, 195.)

Now that the project has been implemented, Jønch-Clausen (2011) states that while the various products of the NNRBDP are very useful to support further development in the basin, including the NNRB IWRM Plan, they do not adequately reflect local knowledge, priorities, and aspirations. Consultations have been held during the NNRBDP, but not sufficiently, and there is a need to 'restart' local consultation processes in order to develop realistic plans for all parts of the NNRB. "In fact, consultations at province and district levels have shown that the NNRB IWRM Plan may be a useful general framework for planning, but that it requires 'field verification' and stronger linkages to local priorities, including the five-year province and district development plans." (Jønch-Clausen, 2011, 12.)

It has been frequently suggested that the existing organisations and institutions at the river basins should be used as a basis for developing River Basin Organisation (RBO) models. The consultative processes of the regional IWRM study (Bandaragoda, 2006) showed that "the transposition of RBO models for each river basin was not essential for implementing IWRM in Asian developing countries. Instead, the stakeholders opted for 'institutional adaptation' strategy, in which existing institutions could be improved and built upon for establishing IWRM without having to replace them totally with new ones, and with minimum disruption to the whole institutional framework". (Ibid., 14.)

Moriarty (et al., 2010) consider that so-called “light IWRM³⁸” could be a more incremental and opportunistic application of the core principles of IWRM at the sub-national and sub-basin levels. “Light IWRM is intended as an approach that is less formulaic and predicated on improved communication, information-sharing, and negotiation between different water users. In contrast to the normal top-down IWRM package, light IWRM aims to be a pragmatic, problem-focused, and adaptive local solution”. (Moriarty et al., 2010, 123.). This approach could possibly be useful in Lao PDR bearing in mind the variety of local contexts when developing river basin governance and processes. There is a need to facilitate and improve stakeholder dialogue to build a shared vision for river basin plans and strategies in the country (see e.g. Bach et al., 2011; Jønch-Clausen, 2011).

Dinar et al. (2006, 20) have found financial dimensions of decentralised river basin management to be both important and complex. Success is associated with central government support for water user financial responsibility, and with the idea that revenues generated within the basin remain in the basin. “Thus, it is the combination of financial responsibility (on the part of water users), financial autonomy (basin revenues remaining in the basin), and central government support that is associated with success, and not necessarily one element alone.” (Ibid., 20.)

Sustainable financing of watershed and river basin management is an issue of concern also in the whole LMB Region. Long-term success and sustainability of watershed and river basin management initiatives depends on securing ongoing funding and this has often been a problem (Bach et al., 2011, 3, 4). A variety of economic and financial approaches and tools³⁹ like carbon finance and Reducing Emissions from Deforestation and Forest Degradation (UN-REDD+) pilot projects already exist for integrated watershed management in the Mekong region. However, there is a need to look at the diverse portfolio of funding mechanisms and incentives to enhance the financial sustainability of river basin management and to take river basin ecosystem values into account. (Ibid., 33, 37, 42.)

“The search for appropriate funding mechanisms is a major concern for the first two pilot river basin committees to be set up in Lao PDR. Nam Ngum River Basin Secretariat, which is currently in the process of designing a river basin fund,

³⁸ The Light IWRM approach was developed as part of the EC funded EMPOWERS project in three middle-eastern countries: Egypt, Jordan, and Palestine. It is developed specifically for use at the intermediate and local levels (that is, sub-national and sub-basin) and is based on a facilitated process of stakeholder dialogue for concerted action supported by a strategic planning framework. More information available at http://www.water-alternatives.org/index.php?option=com_content&task=view&id=126&Itemid=1

³⁹ Information on financial approaches and tools available at <http://www.mrcmekong.org/assets/Publications/Reports/Watershed-Management-report2011.pdf>

is scoping out the potential of using various financing mechanisms. These include raising new revenues from a variety of sources, including corporate contributions, biodiversity offsets, new service fees and payments for river basin services.” (Bach et al., 2011, 37.) As discussed in Article I, the Nam Theun 2 Hydropower project is funding watershed management and the Watershed Management Protection Authority in recognition of the economically valuable services they provide downstream electricity generation. “The project is implementing a benefit-sharing mechanism by investing in the Nakai-Nam Theun protected area hoping to achieve ‘win-win’ solutions in terms of reduced costs and improved efficiency in hydropower generation, and income/funding for upstream land and resource managers” (Bach et al., 2011, 35).

5.2.3 Irrigation Sector – Irrigation Management Transfer

Decentralisation is taking place in irrigation through the transfer of management and financial responsibility from irrigation systems managers to local/farmer user groups or Water User Associations (WUAs) and it has gained prominence in several countries. “Water user associations are seen by many social scientists as an essential element for improved irrigation systems performance” (Barker & Molle, 2002, 17). They have been promoted as both a management and a governing structure for irrigation systems (Vermillion, 1997, 31).

In Lao PDR, one of the Government’s strategic visions for the agricultural and forestry sector is the expansion of irrigation. Projects are being managed more effectively and new projects are expanding the area under irrigation. (Government of Lao PDR, 2004.) According to the Seventh NSEDP, irrigated area in the dry season is to be increased to 5,000 km² by 2015, including 3,000 km² for dry season irrigated rice; wet season irrigated areas are to be expanded to 9,500 km² (Government of Lao PDR, 2010, 17). The Government’s strategy for irrigation has focused on improving the operation and management (O&M) of existing irrigation schemes, promotion of participatory approaches, and enhancement of community management of small-scale irrigation schemes (The Government of Lao PDR, 2004).

The Government has initiated a nationwide program of irrigation management transfer where the operation and management of irrigation schemes is transferred to the farmers. An important feature of this strategy is a vision expressed by the Government to shift its role to become an enabler and facilitator for development, with greater participation of farmers in the planning, design, construction, and O&M of small-scale irrigation schemes. The ongoing program of transferring

irrigation management to the beneficiaries has become critical to the sustainability of these schemes. “The number of pumping schemes being implemented considering the transfer of responsibility needs to be increased” (WRCCS, 2005, 69).

Article IV shows that Irrigation Management Transfer (IMT) largely followed IWRM principles, decision-making and responsibilities were decentralised, and the aim was also to increase efficiency. The Government launched initiatives to establish and develop WUAs with an appropriate legal framework to remedy operation and maintenance deficiency and improve irrigation system operation. Accordingly, these WUAs would be trained to undertake financial, administrative, and technical functions to operate and maintain the irrigation schemes. (ADB, 2005, 19.) Figures 13 and 14 present some of the sites of the irrigation projects visited and studied during the In-Balance project in 2004.

The outcome of decentralising responsibilities to water-user groups (WUGs) and associations (WUAs) has been at least to some extent been positive with water fees paid by users of operations and maintenance costs. Water distribution efficiency has



Figure 13: Through the CMI Project, concrete weirs were constructed to replace earlier wooden structures in Vang Vieng (photo taken by Sari Jusi in November, 2004)



Figure 14: Irrigation canal of one of the irrigation schemes under the DIDM Project in Hai Thangone village, Vientiane (photo taken by Maarit Virtanen in October, 2004)

risen. Several irrigation case (field) studies in Article IV show that the sustainability of irrigation systems depends on farmers' ownership of the scheme and their participation in scheme management. Generally, the establishment of WUGs and WUAs has increased farmers' ownership to the irrigation schemes only to some extent. It is challenging to get the farmers commit themselves to their responsibilities under the new IMT partnership. Moreover, as Article IV stated, the insufficient institutional capacity of provincial and district authorities and the lack of adequate extension services are delaying the IMT process and in fact the sustainability of the irrigation systems.

“WUGs or WUAs can serve as building blocks for a nested level of democratic representation in water- management decisions but they can also be means to merely shift part of the O&M costs from the state to the users” (Molle, 2005, 26). Cernea and Meinzen-Dick (1991) argue that the WUAs must belong to the water users, not seen as an unpaid extension of the irrigation agency. “They are to be a forum for farmer participation and self-management/administration, not a means of extracting resources from farmers or forcing them to perform certain tasks.” (Cernea & Meinzen-Dick, 1991, 54.) Samad and Merrey (2005) and Merrey (1997) (synthesising from other sources in Merrey et al., 2007, 203) also argue that the importance of successful IMT is that the benefits exceed costs and are proportional to farmer investments. They further emphasise the legal and political recognition of farmer organisations, including their right to raise revenue, apply sanctions, and enter into contracts.

The ADB’s evaluation report (2005) regarding the Bank-funded Decentralized Irrigation Development and Management Sector Project (DIDM⁴⁰) in Lao PDR states that farmers have come to view IMT as a mechanism for the Government to pass all responsibility to them. Farmers see few benefits and some risks from IMT, and may hesitate to accept the transfer. (ADB, 2005, 41.) As regards legislation on irrigation management transfer, it was found to be unclear and thus hindering successful IMT process, as discussed in Article IV. This research result is in line with the research by Samad and Merrey (2005) and Merrey (1997) (synthesising from other sources in Merrey et al. 2007, 203) who stated that one of the necessary conditions for successful IMT is clearly recognised and sustainable water rights and water service.

Regulations on WUAs and Irrigation Transfer in Lao PDR were not in line with other legislation stating that Government property cannot belong to anybody. There was ambiguity about whether scheme ownership will be transferred to the WUAs, with differences between the English version of the relevant decree (which infers ownership transfer) and the Lao version (which does not). Thus, with the lack of defined water rights, it is not clear, for example, whether farmers could after IMT sell or rent their irrigation system. It is desirable that ownership and management of the irrigation schemes are transferred to the WUAs for farmers to take full responsibility for O&M of the irrigation schemes. However, this requires review of the existing IMT policy, O&M sustainability, affordability, and the capacity of WUAs for O&M of the irrigation systems with or without further assistance, taking

⁴⁰ The author conducted field studies also to some of the DIDM irrigation schemes and these are reported in Article IV. The ADB’s evaluation report on the DIDM was not available during the field studies ADB’s Report being released only after the publication of Article IV.

into account specific responsibilities of the Government and the extent to which these responsibilities or parts thereof can or should actually be devolved to the WUAs. (ADB, 2005, 41.)

The various roles and responsibilities, such as those encapsulated in legislation on water rights and ownership, have a complex relationship with water governance. How property rights are defined, who benefits from these rights and how they are enforced are all central issues that often require clarification as patterns of supply and demand change. (UNDP & SIWI, 2012.) The question of transfer of true ownership to WUAs with water use rights and the right to make legal contracts and own property is interesting in Lao PDR. The future will tell whether WUAs will be developed as viable organisations and as a kind of “quasi-official” bodies to take over local management of irrigation systems with property rights and proper conflict resolution arrangements. Currently, only a few WUAs have been established as this process is very time-consuming and the Government remains the main regulatory power.

Article IV shows that the questions of farmers’ ownership and commitment to irrigation schemes can constitute difficult issues even in new projects emphasising participation. It seems quite difficult to get farmers to really commit to their responsibilities under the IMT partnership due to the fact that they are used to depend on the Government for major irrigation reconditioning works. There has been limited farmer ownership for the schemes as it is the Lao Government who has constructed them and given regulations on their management. There are good examples of projects in other countries that confirm the importance of farmer participation in irrigation schemes. The experimental program successfully adopted within the National Irrigation Administration of the Philippines has demonstrated that the active participation of farmers in the early stages of project planning, adoption of a learning approach by the participants, and the mobilisation of those resources needed to reconstruct physical works can enhance long-term sustainability (Korten & Siy, 1988 in Ostrom, 1992, 10).

One of the key findings of Article IV is that it seems impossible to implement Irrigation Management Transfer (IMT) packages that are applicable in every village within a certain area, because each village has different demands and the economic and cultural differences in a geographically compact area may be enormous. It might be preferable to offer a range of possible solutions to farmers to implement the IMT process and to allow considerable variations of WUGs’ formation and management. “The process of tailoring to local conditions should begin by giving farmers a voice in shaping the organisations” (Cernea & Meinzen-Dick, 1991, 56). This fact has also been acknowledged by Ostrom (1992) who states that “the crafting

of irrigation institutions is an ongoing process that must directly involve the users and suppliers of irrigation water throughout the design process. Instead of designing a single blueprint for water-user organisations to be adapted to all irrigation systems within a jurisdiction, officials need to enhance the capability of suppliers and users to design their own institutions. Direct involvement of suppliers and users will help ensure that development institutions are well matched to the physical, economic, and cultural environment of each system". (Ostrom, 1992, 14.)

There is a consensus concerning the variables, which will most likely enhance self-organisation and strengthen common-pool resource (CPR) institutions including irrigation projects and the design principles characterising successful, long-term governance arrangements (Anderies, Janssen & Ostrom, 2004; Ostrom, 1990). Ostrom (1990, 90) has derived a series of design principles that characterise the configuration of rules that are used. By 'design principles' she means an "element or condition that helps to account for the success of these institutions in sustaining the (common-pool resource) and gaining the compliance of generation after generation of appropriators to the rules in use. Findings of CPR case studies and the design principles show that the CPR institutions with high levels of performance clearly demark who has the right to use the resource; they have crafted rules that are considered fair and well-matched to local physical, biological, and cultural circumstances; and have invested in monitoring and sanctioning" (Ostrom, 1994, 13).

"By enhancing the capabilities of those who are directly concerned with the particulars of a local situation to organize themselves in enterprises that may be deeply nested – to take care of externalities – is a potentially more successful strategy than proposing idealized institutional arrangements that are considered the optimal way of solving resource problems" (ibid., 25).

Utilising institutional analysis of irrigation systems, large and small, around the world, Ostrom (1992; 1994) argues that social capital and the rules governing how water users interact among themselves and with irrigation managers are just as important to a project's success as are well-constructed engineering facilities. She stresses the importance of ongoing crafting of institutions, which must directly involve the beneficiaries or their representatives of an irrigation system throughout the design process including designing of physical works and the institutions for financing and operating these systems. "The term "crafting" emphasises the artisanship involved in devising institutions that both match the unique combinations of variables present in any one system and can adapt to changes in these variables over time. Involving users and suppliers directly in this process helps

promote institutions that are well-matched to the particular physical, economic, and cultural environment of each system” (Ostrom, 1992; 1994, 21, 25).

Attributes of a resource and resource users are strongly affected by the larger political regime in which users are embedded. External authorities like national governments can do a lot to enhance the likelihood and performance of self-governing institutions, but their actions can also seriously impede these developments (Ostrom, 2002, 1329). Larger regimes can facilitate local self-organisation by providing accurate information about natural resource systems, providing arenas in which participants can engage in discovery and conflict-resolution processes, and providing mechanisms to back up local monitoring and sanctioning efforts (Ostrom, 2007, 10). “The probability of participants adapting more effective rules in macro-regimes that facilitate their efforts over time is higher than in regimes that ignore resource problems entirely or, at the other extreme, presume that all decisions about governance and management need to be made by central authorities” (Ostrom, 2002, 1325–1326). Van Hofwegen (2000, 144) also emphasises that the main policies and major concepts should be regulated by law and the interest groups should be given the opportunity to formulate their own way of co-ordination and operation. “Government support for decentralisation is found to be beneficial as long as it allows the stakeholders to initiate and lead the reform process” (Dinar et al., 2006, 22).

5.3 Participation

Public participation has become an increasingly important aspect of natural resource management (NRM) and its advantages and benefits are universally recognised and its validity and usefulness in decision-making processes widely accepted. Participation in NRM has the potential to improve knowledge and understanding of environmental processes and change behaviour on both individual landholdings and at the catchment area. Moreover, local inhabitants often possess considerable knowledge about their environments which can directly contribute to NRM strategies and decisions. (Broderick, 2005, 286; Mostert, 2003, 5, 6.) “It has been emphasised that natural resources management related policies, including water, requires the use of knowledge, experience and opinions of local communities who are the key stakeholders in resource conservation. This could be ensured through public/community participation” (Dungumaro & Madulu, 2002, 1).

Mody (2004) has described how participation⁴¹ can occur at different levels, including dialogue among stakeholders such as hydropower utilities, central and local government agencies, business representatives, agriculturists, and users. It may also occur at the level of water user associations, where users bound by a single purpose may organise themselves. Stakeholders may participate in workshops, through membership in administrative bodies, or in public hearings. The lowest appropriate level of management in a river basin may be the river basin authority that invites participation or it may be a water user association that monitors, operates, and manages a small-scale irrigation system. Some user associations with elected officers and perhaps with self-financing mechanisms may be registered, while others are more informal. (Mody, 2004, 11, 12.) “Many governments have a very instrumental view of local communities and related community-based organisations, and their active involvement is normally sought only for implementation of water projects. Participation in a truer sense would entail involvement throughout the whole policy or project cycle”. (UNESCO-WWAP, 2003, 378.)

Building and strengthening the capacity of community-based organisations, water user associations, and other stakeholders to enable them to take a more significant role in decision-making on water issues is one of the long term aims of IWRM while striving for sustainable results (Xie, 2006, 7). These goals are also recognised in Lao PDR as discussed in Articles II and IV. “IWRM cannot succeed in the absence of genuine and effective participation of ‘water stakeholders,’ especially local resource-users” (Jones, Newborne & Phillips, 2006, 17). “Giving a voice to all user groups and affected populations ensures that social welfare considerations are given proper weight” (Xie, 2006, 7). Administrative decentralisation can effectively be reinforced by stakeholder participation (Mody, 2004, 11).

Responsibility shared between formal decision-makers and the public is often seen to lead to more equitable socio-economic and ecological outcomes (Bandaragoda, 2005; Collentine et al., 2002; International Conference on Freshwater, 2001; WCD, 2000). No. 3 of the Dublin Principles also emphasises the role of women and states that women play a central part in the provision, management, and safeguarding of water. This requires positive policies to address women’s specific needs and to equip and empower women to participate at all levels in water resources programmes, including decision-making and implementation. (ICWE, 1992.)

The Government of Lao PDR has recognised the need for development and protection of gender equality and empowering women in the Seventh Five-Year National Socio-Economic Development Plan (2011–2015) (Government of Lao PDR,

⁴¹ FAO provides some guidance on participatory attitudes and key principles of applying participatory methods/tools at: http://www.fao.org/Participation/ft_princ.jsp

2011b). In 2003 the Government also established a National Commission for the Advancement of Women (NCAW) with the aim of developing and coordinating implementation of a national policy and action plan for women's advancement (ADB, 2004a, xiii). Multilateral development agencies (ADB and World Bank) and UN agencies, such as the United Nations Entity for Gender Equality and Empowerment of Women, have projects and programs developing gender equality and empowering women in Lao PDR.

Generally, women remain poorly represented throughout the government administration and the judiciary.⁴² In all ethnic groups women have traditionally deferred to men in community decision making, in dealings with government officials, and in legal matters (ADB, 2004a, x). With regard to community-based irrigation management of the country, Article IV revealed that women's participation in WUGs, especially regarding ethnic minorities, is much lower than that of men due to their low literacy rate and insufficient capacity for participation.

"IWRM emphasises broad-based capacity building and supports the formation of user groups and representative associations" (Xie, 2006, 7). The Fourth World Water Forum by the World Water Council (2006) stated that public participation enables the use of local knowledge for risk management, supports the transfer of technology, creates social networks of awareness, and furthers innovation. "Regardless of the degree to which water resources management is centralised, involving water users and interest groups remains important for the establishment of an enabling environment for IWRM" (Hassing et al., 2009, 7).

It is essential to remember that the political system determines the degree of participation (Castro, 2011), especially in Asian developing countries. The scope of public participation in decisions about natural resources can be limited by democratic experiences and the type of government in the area in question (Bandaragoda, 2005). When analysing participation one must consider who participates and on what occasions, the form of participation, the content, communication elements, and the outcomes (Castro, 2011).

5.3.1 Some Characteristics of Participation in Lao PDR

People's participation is defined as one of the core pillars that are at the base of the governmental development strategy in Lao PDR. The Seventh NSEDP (2011–2015) seeks to promote ownership and encourage people and mass organisations

⁴² For more information on gender issues in Lao PDR, see: <http://www.unwomen-eseasia.org/docs/factsheets/04%20Lao%20PDR%20factsheet.pdf>

to participate in development activities in order to achieve targets as planned (Government of Lao PDR, 2010, 29). The importance of wide community participation has been stated and reaffirmed in other institutional documents and programs such as:

- ◆ GPAR, Governance and Public Administration Reform program, started in 1997 under the Civil Service Authority (PACSA) and coordinated by the UNDP
- ◆ Decree No. 01/PM of 2000, an instruction of the Prime Minister to build the provinces into strategic units, districts into budget-planning units and villages into implementation units
- ◆ The Public service reform – supported by a new civil service statute (Decree No 82/PM) which provides for greater accountability, transparency and performance in government
- ◆ Law on Local Administration (2003) which clarifies roles and responsibilities of sub-national governments and provides for greater citizen participation in governance (Bertinelli, 2011, 31).

The principle of participation is problematic for the Lao government, as it is based on a one-party system. Geographical realities as well as cultural traditions deeply rooted in the Laotian society further hamper the efforts to ensure equal opportunities for all groups of population (The Government of Lao PDR, 2003a, 24). There have been profound obstacles to introducing participatory practices in the country that is traditionally “top-down” driven. The concept of participation is present in many official development documents, but real applications are lacking. In the public and political structures of Lao PDR, women are highly underrepresented (Ostberg, 2008, 27). Stuart-Fox (2005, 22, 23) sees that participation in political processes could be easily improved by allowing village and district councils to be popularly elected.

The voice of civil society has been restricted by the fact that the country has not allowed the formation of national non-government organisations (NGOs) with any independent social agenda. However, the Government is developing participatory approaches and Lao PDR’s new policies are at least formally announced to include fully decentralised ‘bottom up’ participatory planning within the governmental system. (IWMI, 2006, 4.) A new Decree on Associations has facilitated people’s participation through local institutions. Civil society organisations can now legally register as independent actors in the country. Legislation allowing not-for-profit organisations to officially register was passed in 2009, with UNDP supporting the drafting of the Decree from 2007 onwards. In practice, new legislation means that

many civil society organisations can register in the country and receive funding from local and foreign sources, thus helping to deliver services related to achieving the MDGs. (UNDP, 2010.) This will possibly pave way for national NGOs (Government of Lao PDR, 2010, 11).

5.3.2 Participation at the Water Sector

Articles I–IV all accentuate the limited human and financial capacity of Government agencies to establish and implement public participation and consultation procedures and processes. These deficiencies also limit the implementation of IWRM. There is a need to strengthen dialogue and negotiation, and to develop participatory and consultative policies and programmes in natural resource management. Participation in Lao PDR is still hampered by poverty, lack of education, lack of infrastructure, gender and ethnic discrimination as well as hierarchal traditions. Environmental Research Institute (2001, 57) also mentions lack of regulations on public involvement and data and information related to public involvement as major constraints. In addition, there are financial constraints and limitations for public participation. “Political decision-making remains in the hands of the Party. District and provincial development plans, supposed to be derived from people’s consultation and participation, seem rather to be produced on the basis of national level interests” (Bertinelli, 2011, 31).

Article II discusses the need for participatory approaches and stakeholder involvement in consultations on water policies and legal decisions and on carrying out water resource planning scenarios in Lao PDR. “One common thread that links all the Mekong countries is that civil societies have had no input in the creation of their water laws” (IWMI, 2006, 3). Having laws and reforms in place does not necessarily mean they are applied and implemented. This has been the case with the Water Sector Strategy and Action Plan (The Government of Lao PDR, 1999) as well as the Water Resources Law (The Government of Lao PDR, 1996). Even though water use and allocation conflicts are rare in Lao PDR, concerns have been raised about Lao PDR’s capacity to put law-based water rights into practice and about its ability to monitor and enforce them. (IWMI, 2006, 3.)

One of the core objects of the new National Water Strategy and Action Plan 2011–2015 is to develop river basin planning procedures and priorities on river basin and sub-basin planning and plan implementation. One of the things to consider in the planning procedures is consultation with stakeholders and the implementation of plans through community and stakeholder awareness and participation. (WREA,

2010b, 3.) The strategy has a separate program on awareness, participation, and capacity building. That program aims to disseminate information, including new water policies and strategies and the revised law. The program also targets to disseminate information on river basin and sub-basin planning activities and plans, promoting consultation with concerned stakeholders and participation in water resource management by local communities and other water users. Promotion of awareness and participation in improving water use efficiency, encouraging women to take part in water resource management, and promoting gender-specific activities are the main objectives of the program. (WREA, 2010b, 6.)

Legal backing of planning procedures is crucial for the actual implementation of these planning processes. “River basin organisations instituted by governments do not usually provide sufficient opportunities for the civil society to play a meaningful role in decision-making processes” (Bach et al., 2011, 28). However, in the case of development of the Nam Ngum River Basin Committee, there are opportunities to enhance participation of civil society in the basin organisation. Decree No. 293 (which enables the establishment of river basin committees) specifies that the basin-level committees are chaired by the Provincial Governor and insists that membership be almost exclusively limited to national and provincial Government agencies, there are no such stipulations for the sub-basin committees (Bach et al., 2011, 24).

This opens a window of opportunity to create a dialogue platform with much stronger participation from civil society, including the private sector. The Vice-Governor is expected to chair the sub-basin committee and to act as the Vice-Chair of the Nam Ngum River Basin Committee, thus ensuring that the efforts of civil society involvement and decisions are integrated at the basin level (*ibid.*). Thus, IWRM and the principle of participation may be seen as tools to enhance democracy and good governance in favourable conditions in general, in this case at the sub-basin level. It remains to be seen if the institutional arrangements of sub-basin committees succeed to enhance participation and to bring forth the standpoints of civil society and business actors by strengthening local linkage in the future.

Overall, public participation is a challenge to many development projects in Lao PDR. Elements of public participation need to be included in hydropower development and planning. Furthermore, hydropower projects also have to be responsive to contextual needs and political reality. Moreover, public involvement in hydropower developments needs to be considered and evaluated within the larger framework of project development, appraisal, implementation, and decision-making (see e.g. IHA, 2004; WB, 2009a; WCD, 2000). As Article I on hydropower challenges and Article III on the Theun-Hinboun hydropower project point out, there is a need for more efficient consultation and participation of all stakeholders

including local people in the hydropower planning system to take more effectively social and environmental issues into account.

Article III unveils that the developers of the Theun-Hinboun project did not address the potential for environmental and socio-economic impacts well enough, decision-making and environmental impact assessment (EIA) processes were inadequate, and there were some conflicts of interest in the project planning and implementation phase. Lack of consultation with affected people meant that many villagers were suffering from unexpected impacts and were unaware of any procedures in place to deal with those impacts. The Theun-Hinboun Power Company is expanding its project to a new total capacity of 500 MW which is scheduled to be completed in 2012⁴³.

Lingual, educational, and cultural barriers are significant issues limiting local communities and provincial and district authorities from getting truly involved as equal and powerful participants to consultation meetings. These barriers also restrict understanding regarding the impacts, costs, and benefits of hydropower projects (Lawrence, 2008). Dialogue with local authorities and people affected should be initiated so that all implications are well understood (MRC, 2009). Lao dam development process also lacks a consultation process with neighbouring countries (Lawrence, 2008).

As regards irrigation, the IWRM principles of participation and decentralisation have been implemented and actualised through Irrigation Management Transfer (IMT) process in Laotian irrigation schemes, as already discussed in Chapter 5.2.3. However, as Article IV reveals, the devolution of control over resources from the state to local organisations does not necessarily lead to greater participation and empowerment of all stakeholders. Aforementioned cultural and lingual impediments are also significant issues limiting participation of women and

⁴³ The Theun-Hinboun Expansion Project (THXP) involves a 70m high upstream dam and reservoir on the Nam Gnouang River and a new 60MW power station at the Nam Gnouang dam, 230MW expansion of the existing THPC capacity, and 150 km of 115kV and 230kV transmission lines. The THXP is scheduled to be completed in 2012 with all available electricity output from the downstream power plant (total of 440MW) will be sold to EGAT pursuant to an amended Power Purchase Agreement while the electricity from the upstream powerhouse will be sold exclusively to EdL. For more information: <http://www.thpclaos.com>

ethnic minority groups⁴⁴ in water user groups (WUGs). Article IV remarks that few Government officials understand the participatory approach, as the education system has only very recently began to include some training on the social sides of irrigation management. Women do participate in WUGs to some extent but lack of education and language problems strongly affect their participation. By and large, the heterogeneity and diversity of the country in terms of poverty levels, infrastructure, and educational levels are hampering people's participation.

5.4 Postscript: Self-assessment

The research was conducted using “a case study approach to produce ‘thick’ contextualized knowledge” (Eriksson & Koistinen, 2005) on Laotian water regime (governance structures and institutions) and the implementation of IWRM in this specific case in the water use sectors of hydropower and irrigation and at different levels. As discussed earlier, Lao PDR can be considered a ‘critical’ case as the experience and lessons learned from Laotian IWRM implementation could be transferred or used/tested for studying other cases and contexts as well due to the less complex environment (communist top-down regime), comparing to the complex water regimes of Western countries. The case study approach seems to be suited to this research in spite of the fact that synthesising the research and creating a coherent storyline has been a challenging task as the research has been built on separate case studies (Articles I–IV).

The research process has increased the Author's understanding and knowledge of water governance issues and their complexity, including different levels and scales of water governance and the interconnections to socio-economic environment and to the whole society. Studying relevant literature, field work and dozens of key informant interviews have actualised this. The use of the MTF framework could have been more elaborate and study a greater number of Action Situations (ASs) and related social interaction by looking more closely at the network of action situations located at various levels and connected through operational outcomes, institutions, and knowledge.

⁴⁴ Ethnic minority groups refer primarily to the Khmou (Mon-Khmer) and Hmong (Hmong-Mein), who clearly have a social and cultural identity distinct from Lowland Lao society (the largest ethnic group). The historically, politically, economically and socially dominant Lao-Tai are the primary residents of urban areas, and also live in the high density, agriculturally productive lowland areas around Vientiane and the Mekong corridor. The Mon-Khmer people, whose presence in present day Lao PDR predates all the other groups, typically live in midland rural areas of the North and South. The Hmong-Lu Mien people are found in the uplands and high mountains in the north and the Chinese-Tibetan are located in the northern highland areas (King & van der Walle, 2010, 2).

The results of the research will probably be of interest to other researchers, government officials, and NGOs working in the water field as the topic of the research is becoming more emergent due to increased water demand, complexity, and fast changes occurring in the water field. The research extends and illuminates some new issues of IWRM from different angles by using MTF. The role of actors, complexity, and ASs are emphasised to highlight the importance of these elements in IWRM. The Author wishes that this research can provide some further understanding on IWRM processes and the MTF and IAD approach of the research can stimulate interest in the water field.

6 Key Findings and Conclusions

6.1 Developing IWRM

Management of water resources is constrained by a variety of uncertainties, such as unpredictability, incomplete knowledge and ambiguities, affecting problem identification and their solution (Pahl-Wostl, 2007b). Pahl-Wostl et al. (2007b) have emphasised the need to fully take into account the complexity of the systems to be managed and to give more attention to uncertainties associated with management. As many of the NeWater project documents and articles state and accentuate, “a better understanding of the transition processes and the barriers and facilitators for change is essential to catalyse change and foster the implementation of a transition process toward integrated and adaptive resource and water management regimes” (Pahl-Wostl et al., 2007b).

“There is a clear need for a shift from conventional command and control strategies to integrated and adaptive water management and governance” (Pahl-Wostl, 2007b, 2). New water management paradigms nowadays include environmental and human dimensions as well as governance issues, which were mainly neglected in the previous technically dominated approaches (Pahl-Wostl et al., 2011). There is a general agreement in the water community that IWRM has so far provided the most suitable if not the only viable way forward for sustainable water use and management – although there are no universal solutions or blueprints and there is much discussion on how to put the process into practice (GWP, 2003, 30). Moreover, there is much discussion about the possibilities of successful transferring of the institutional models into the context of a developing country (Bandaragoda, 2006, 13).

The use of MTF and IAD framework in this research has enhanced analysis of IWRM approaches by revealing issues embedded in the specific context of Lao PDR and by emphasising the role of actors in the Laotian water regime. Studying Action Situations (ASs) related to the Laotian water regime reforms (decentralisation and integration processes and participation) has unfolded management and policy

issues involved in these processes at different (local, national, and regional) levels. Through ASs the MTF has provided a platform or framework to incorporate actors into analysis and produce a richer analysis and understanding of actors involved in the policy arena and their features and interactions. As regards MTF, integration and coordination between the different levels of Laotian water governance have been studied by analysing action situations involving different actors and producing different outcomes, such as water related laws and policies discussed in Chapter 5.

“Solving water management problems in an integrative and iterative way under uncertainty thus requires a broad perspective; one that includes the technological, environmental, economic and societal aspects of a problem, considers multiple spatio-temporal scales of analysis, as well as the potential trade-off and long term implications of the different short term managing options” (van der Keur et al., 2006, iii). Challenges remain in reducing the gap between implementation and “academically” or theoretically agreed policies (Rahaman & Varis, 2005). As Keskinen (2010, 66) states “both the theory and practice of integrated water management approaches need to be continuously improved, updated and adapted so that they correspond to the differing, complex and continuously changing management contexts.”

“Adaptive water management has been proposed to improve the conceptual and methodological base to realise the goals of IWRM in an uncertain and complex world” (Pahl-Wostl, 2007b; Pahl-Wostl & Sendzimir, 2005, 6). Rahaman and Varis (2005, 18–20) also highlight several points that need to be addressed by water professionals far more carefully to successfully implement IWRM. Issues of privatisation, transboundary river basin management, and water as an economic good should be incorporated to IWRM policies and principles to overcome implementation challenges and to ensure sustainable water resources management. Within the principle of water as an economic good, “it is vital to recognise the basic right of all human beings to have access to clean water and sanitation at an affordable price”, as stated in the Dublin principles shown in Info Box 1. Rahaman and Varis (2005, 18–20) also accentuate the need to address restoration and ecology, fisheries, and aquaculture as well as the need to focus on past IWRM experiences and lessons learned and the spiritual and cultural aspects of water.

There is no generic solution to IWRM and each country and even a region (like Mekong Region) should develop its own IWRM approach depending on its stage of economic or social development, the nature, character and intensity of water problems, human resources, institutional capacities, the relative strengths and characteristics of the public and private sectors, the cultural setting, natural conditions, and many other factors (Dukhovny et al., 2008, 25; GWP, 2009c, 6; 2003,

30, 31; 2000, 6, 7). This need came strongly up in this research as well. “IWRM is an iterative process which means that it needs to be an inherently adaptive approach – one that can accommodate emerging challenges, constraints, and changing social priorities” (GWP, 2009c, 6).

This research reinforces the perspective of Pahl-Wostl et al. (2010), discussed in Chapter five, who indicate that analysing problems embedded in context and supporting the development of context-dependent integrated solutions instead of defaulting to simplistic generic recipes is vital (Pahl-Wostl et al., 2010, 572). The research has emphasised the importance of tailoring IWRM core elements (integration, decentralisation, and participation) to national and local institutional arrangements and capacities. This is a particularly important issue in Article IV where one of the main findings was that implementing IMT needs to be context-sensitive, participatory, and community-driven by nature. As Lao PDR is connected to global forums, e.g. Global Water Partnership and NARBO, it can draw on existing tools and learn from others’ experiences – thereby increasing their chances of success (World Water Council, 2000).

This research and articles have largely focused on issues related to the development of hydropower and irrigation sectors among issues related to institutional and operational environment which revealed many challenges facing water resources management. As stated by former WREA Minister Khempeng Pholsena, increasing scarcity and competition for water can be expected in Lao PDR due to continued development taking place in many sectors, such as hydropower, industry, mining, agriculture, tourism, transportation, and fisheries. Accelerating development will also impact water quality, human health, and natural environment. Due to expected climatic changes, floods and droughts may increase and cause severe negative impacts. Yet, the country is on the way to IWRM. Significant changes to water management policies can be found and new water policies and legislation have been developed in the country. IWRM with the underlying principles of integration, participation, and decentralisation can act as a vital approach and paradigm to improve Laotian water regime and to move it towards sustainable and effective water governance.

In Lao PDR, there are still weaknesses and gaps in understanding and applying effective and integrated approaches to water resources management and there are conflicting and unclear roles and tasks of different water sector organisations, as Article II revealed. Water actors in Lao PDR have not yet developed institutionalised routines and tools (structured approaches) to deal with uncertainties as the complexity of the water environment and system need to be taken into account. Through Action Situation analyses, the Management and Transition Framework has facilitated the analysis of these water sector actors by unveiling and acknowledging

the challenges and problems related to the coordination, cooperation, and participation in IWRM implementation and thus possibly provided a viewpoint that helps manage these problems and uncertainties. Transition to IWRM needs more active stakeholder involvement and more support on social learning (Pahl-Wostl et al., 2007b). Adaptive foresight, the research method used in FREPLA2020 project workshops, has facilitated participation and social learning of Government officials as project workshops provided a platform for information flows between actors and as they learned work together and share their insights.

Water resource politics in Lao PDR presents distinct challenges for the integration and management of water. The country has a highly centralised government regime with weak local and horizontal governance systems with an overall “top-down” tendency and attitude. Replication and transfer of Western democratic principles and models in the context of Laotian water regime is challenging and problematic as the research reveals. The country has embarked on institutional reforms such as the implementation of IWRM under a general sponsorship of multilateral development banks and donors, the most notable actors being the Asian Development Bank, the World Bank, and the United Nations. To induce institutional change, the support from higher levels within the hierarchy is a necessity (SIDA, 2006, 3 in Ostberg, 2008, 30).

The research is in line with the perception of Rogers and Hall (2003), who note that more decentralisation is needed in water governance along with a stronger central role in IWRM, also in Lao PDR. The proper and necessary financial resources and human capacity development must also be secured at the local level. (Rogers & Hall, 2003, 36.) However, decentralisation and participation – underlying elements of IWRM – are top-down policies and still far from being completed as shown in all the research Articles.

At present, decentralisation policies of the Government are still being implemented basing on the transfer of function but not the transfer of power. These policies and development strategies designed at the top by central Government authorities do not necessarily take the demands and the capacity of local organisations and populations and the variety of contexts into account. Consequently, such efforts do not address the specific circumstances and problems of different communities and social groups as the case of irrigation management transfer (IMT) and the case of Theun-Hinboun hydropower project (and hydropower sector more generally) reveal. The people affected by irrigation and hydropower development projects need to have a voice in the planning and implementation of those projects. “Consensual decisions and decision-making will be more effective in conserving water resources and incorporating the views of relevant stakeholders. They will ensure more sustainable

and more socially acceptable solutions in the longer run”, as concluded in the 6th World Water Forum (2012) in Marseille, France.

It seems that the central Government controls water resources development at the national level through national development policies and strategies, such as NGPES and NSEDP, without strong influence from IWRM approach and plans. The Lao government is highly emphasising the promotion of economic development of the country by increasing the number of hydropower projects. Hydropower and irrigation development and management can be seen relating ultimately to politics, to power relations, culture, and social choices. As Lao PDR is an authoritarian and monolithic country, one may ask whether there is true political will to decentralise power and to allow the local level to be a real decision-maker and actor in issues dealing with water development and management. This statement of the research is reinstated by Poppe (2004, 14) who views that “decentralisation reforms represent an effort to consolidate state control and state-defined development gains in water, agriculture, and forestry sectors as well as to increase state control over remote areas in Lao PDR”.

The country is currently developing River Basin Committees (RBCs) and it remains to be seen if the establishment of the committees will be successful in terms of establishing and consolidating IWRM at the river basin level. Capacity of the RBCs with sustainable and proper funding will be crucial to the result. Bach et al. (2011) have stressed the importance of employing both top-down and bottom-up approaches and to ensure that institutional linkages exist between the local and the national/regional levels in river basin management. Ensuring communication between all levels of stakeholders and enhancing opportunities for stakeholder involvement can facilitate this employment (Bach et al., 2011, 11, 38). This was also one of the key messages of Article II alongside the need for multi-objective decision-making about water resources at the basin level. River basin development plans need to be linked and integrated to other development plans at different levels (from local to regional).

As participation is vital for implementing IWRM, an important issue is the development of participatory processes and people’s capacity to participate to planning at provincial, district, and especially community/village levels. Promoting participatory management through transferring management responsibility of irrigation schemes to water user groups and associations and the establishment of RBCs are positive signs towards IWRM in Lao PDR. However, people’s participation in the context of access to and influence over policy and decision-making is weak. Water resources management is still pretty much centralist by nature and does not properly involve local stakeholders in the management process.

The IWRM institutions are still meager to implement public participation from national to sub-national scales over the control of natural and water resources in Lao PDR. Human and financial capacity of Government agencies to establish and implement public participation and consultation procedures and processes is limited. Especially local level water organisations, like MONRE (former WREA) units and WUGs/WUAs are facing serious capacity constraints (S. Komany, personal communication, August 20, 2010). There is also a lack of data and information related to public involvement and financial constraints (Environmental Research Institute, 2001, 57). Lack of public access to information on environmental and social impacts of large natural resources projects as well as mitigation plans and measures can exacerbate the negative impacts.

Improvement and implementation of strong ownership of IWRM by the Lao authorities, and well-established, clearly defined institutional arrangements and integration between the various organisations and administrative levels are fundamental issues in building sustainability in IWRM, as demonstrated in Figure 1, depicting IWRM and its relations to sub-sectors. Integration or co-operation among governmental agencies is not strong and public participation does not influence local decision-making although it is recognised as an important issue by the Government. National and provincial government agencies are less prone to integrate as they tend to be entrapped in bureaucratic structures or vested interests. To combine top-down policy implementation and bottom-up participatory processes, integrated management approach across scales, sectors, and communities with multi-stakeholder participation needs strengthening (see e.g. Bach et al., 2011). “Well-organised water governance that encourages social inclusion, stakeholder involvement, transparency and accountability will make it easier to create an enabling environment for local level governments to develop integrated water plans” (Philip et al., 2008, 1).

6.2 Policy Recommendations

To name some key impediments, the lack of human and financial resources, incomplete information, institutional fragmentation, and weak public involvement are inhibiting full IWRM realisation in Lao PDR. There is a need to increase institutional development and coordination by strengthening water management organisations at different levels. As argued in this research, one of the biggest challenges is constituted by capacity constraints in the water sector with references to technical, financial, and human resources. Material and immaterial resources are

needed for capacity building and development. Capacity building needs assessments and training plans for all water related agencies. LNMC needs support in its role as the water sector apex body.

At the provincial and local level former WREA (now MONRE) units need to develop and improve their capacity and to clarify their responsibilities. At the national basin level, river basin committees (RBCs) in priority river basins and sub-basins need to be established and they need support in their coordination role in planning activities of river basins. Since the MONRE is recently established, the different departments and their tasks and roles will need to be more strongly clarified. Overall, there is a need to clarify agency responsibilities among different water management actors. Discovered by this research as well as the FREPLA2020 and In-Balance projects, these needs are more or less identified as top requirements to improve the decision-making for water resources management in the draft National Water Resources Policy and the National Water Resource Strategy and Action Plan for the Years 2011 to 2015 (WREA, 2010a, b).

Applying the MTF framework in this research has shed light on the importance of emphasising complexity and interconnection of water governance/management systems and contextual conditions (political, social, economic, and environmental) which is in line with the findings of the many documents and papers of NeWater Project⁴⁵ and its leading author Claudia Pahl-Wostl. In Lao PDR more open and democratic organisational cultures need to be established to foster collaboration and cooperation required for IWRM. However, this is a real challenge since the Government operates in line with the principle of centralised democracy by concentrating decision-making at the very top and by prohibiting paths for knowledge sharing and expression of opinions.

Coordination and cooperation between ministries and agencies and between central and local levels of administration need improvement and strengthening. Inter-agency competition for budgets and other resources also causes problems and calls for better coordination (Bach et al., 2011, 28). Development of legal and regulatory framework and plans is currently underway: Water Law is being revised and National Water Policy as well as National Water Resources Strategy and Action Plan for 2011–2015 are being developed. However, current water sub-sector programs lack interaction between the policies and plans of sub-sectors (WRCCS, 2005, 66). One vital issue to consider is the incorporation of water resources issues in national and local plans and to realise the connection between the Government's socio-economic policies and their impact on water resources.

⁴⁵ <http://www.newater.uni-osnabrueck.de/>

As WREA (2010b) and this research have revealed, it is important to ensure proper coordination between water resource agencies and national planning agencies regarding water resource planning. Other essential elements are proper water-related investment review and effective and comprehensive environmental and social impact assessment processes. Transition to IWRM needs more active stakeholder involvement and more support on social learning (Pahl-Wostl et al., 2007b). In addition, coordination with international development organisations such as the Mekong River Commission needs to be strengthened.

One major challenge is proper information exchange between relevant actors in transition and development (Borowski & Kastens, 2009, 8). IWRM approaches need to be based on sufficient data and sound evidence to implement them successfully (Bach et al., 2011, 9). In Lao PDR data and information systems require upgrading as planning and management need to be based on sound, coordinated, and reliable data. “An ideal is that information management is based on comprehensive understanding achieved by open, shared information sources that fill gaps and facilitate integration” (Pahl-Wostl, 2007b, 9). National inventory and assessment of water resources needs are necessary to be fully informed of the current situation. The country is already developing river basin planning procedures, such as identification of priority basins, planning procedures, implementation of plans, and monitoring activities, but they need further strengthening. Studying ASs also revealed a need to upgrade information systems and to develop scientific and knowledge-based planning and monitoring in Laotian water regime.

There is a need to strategically assess the water development options (especially hydropower) for Lao PDR and the use of revenues generated by water resources development to social development and poverty reduction activities. As stated in the Round Table Implementation Meeting in 2009, there is a need to increase the share of natural resource revenues to be invested in health, education, vocational training, and human resource development (Government of Lao PDR, 2009, 4). However, as Article III on the Theun-Hinboun dam revealed, there is no clear plan on how the hydropower projects alleviate poverty. Proper benefit-sharing mechanisms are needed so that benefits of water development projects are equitably shared among the people.

Environmental management is an essential element of IWRM, ensuring water for the nature (see Figure 1) with regard to improving safeguard mechanisms, consideration of cumulative impacts, multilevel approach, water quality, and ecosystems (see e.g. Cap-Net, 2005; Roy, Barr & Venema, 2011). Another important aspect in IWRM is the evaluation of risk factors (see e.g. Ganoulis, 2009; GWP, 2000). Water resources need to be managed to mitigate and adapt to climate change

as Lao PDR is expected to be affected by the negative effects of climate change. Climatic changes will particularly affect low-income rural populations that depend on traditional agriculture systems or on marginal lands (MAF, 2010). Climate change is deemed to address flood and drought risk management demands and the need to develop and implement early warning systems more strongly than before. “There is a clear need to integrate climate change mitigation, adaptation and disaster risk reduction into the agenda of water and land management at all levels” (Bach et al., 2011, 18). Climate change research is required to assess the vulnerabilities of different sectors and to carefully develop sectoral strategies and proper adaptation and mitigation measures in the country. Further co-operation with National University of Laos (NUOL) is needed in the field of environmental development and management research. Overall, scientific and knowledge-based planning and monitoring need to be developed. In particular, the Government will need environmental research to support decision-making processes related to natural resources management and development.

There is a need to increase understanding of IWRM and its relation to sustainable development and poverty reduction and the achievement of the MDGs (water supply, sanitation) among Lao officials. The Government sees the use of water resources for economic growth, food security, and poverty alleviation to be the top priorities in water resources development (WRCCS, 2005, 88). Understanding water-food-energy nexus and its implications for water governance is crucial (Hoff, 2011; Hussey & Pittock, 2012).

Lao PDR should also learn from other countries and past mistakes of the water development and management (IWRM) mechanism regarding water governance and sustainable use of water. The use of MTF and IAD-framework by studying ASs and actors and their inter-linkages has raised the demand to emphasise the integration and coordination of different water sectors and actors, currently weak in Laotian water regime. Researching Action Situations related to Laotian water policy reforms and IWRM development has enabled more substantive statements on integration and participation of levels, fragmentation of policy processes, external influence, and distribution of responsibilities at different levels. In the Laotian context there are deficiencies related to these issues and the use of MTF has, in its own part, raised the need to pay more attention to solving these shortcomings.

In the field of hydropower, the country can draw on the lessons emerging from the Nam Theun 2 project which can provide a best practice or at least improved example in environmental management of hydropower projects generally. The preparation of this project has established a framework for environmental management of hydropower, and watershed management and at least to some degree paved the

way for more participatory, transparent, and improved hydropower developments. Some of these lessons can be evaluated and replicated in future projects so the best environmental and social programs are put in place to improve transparency and participatory approaches and effectively manage impacts (see e.g. Porter & Shivakumar, 2011). In addition, the country can learn from IMT processes implemented in other countries.

There is a need to strengthen dialogue and negotiation, and to develop participatory and consultative policies and programs in natural and water resource management. The Government and local institutions can learn from each other, therefore enhancing dialogue is vital. This is also one of the main joint findings of the FREPLA2020 and In-Balance research projects. In addition, raising awareness on water-related issues at all levels is important. This will include dissemination of new national water policy, strategy, and laws as well as information on water resources and their development and protection. Likewise, information related to river basin and sub-basin plans and planning activities needs to be disseminated.

The research has aimed to contribute to existing knowledge of IWRM in Lao PDR. The author thinks the contribution identifies and in numerous instances also fills notable knowledge gaps. The Laotian water resources governance and development face major challenges in the future as hydropower development is increasing fast, irrigation and waterway transport are expanding, and climate change and population growth are on the horizon. These developments will have major implications for the Laotian economy, people's livelihoods, and the environment. They need to be managed in a proper and sustainable way to benefit Laotian economy and the well-being of people. Due to these changes and increasing complexity of the whole water sector, there is a need to see water in the broader development context and a paradigm shift in water development and management from sectoral to integrative approaches (IWRM) is required.

This research on Laotian IWRM can enhance understanding about the mechanisms and processes attached to IWRM processes. As can be seen from the IWRM literature, there is no universal 'one size fits all' IWRM approach: every context and case is unique with different drivers and complexity of issues (see e.g. Dukhovny et al., 2008; GWP, 2000; Medema & Jeffrey, 2005; UN-Water, 2008; Xie, 2006; Yoshida, 2008). The case of Lao PDR has shown that the process towards IWRM approaches is very challenging and the identified IWRM principles of the research are hard to put into practice in the Laotian political, cultural and social environment. The country needs to find suitable ways to co-ordinate policy-making, planning, and implementation in an integrated manner across sectoral,

institutional, and professional boundaries and to take into account the even more complex coordination issues arising over the management of the Mekong basin.

6.3 Further Research

This research has unfolded the importance and need of integrating energy into IWRM and to investigate the interrelation between water and energy issues more carefully. The research has raised the need to conduct more research on the issue to mainstream energy concerns and environmental issues and requirements into IWRM development and implementation. The Management and Transition framework can be used as a tool to widen the IWRM framework to the energy sector – or at least as a way to understand the policies and activities essential when doing so. It may be helpful to see the water and energy issues and related Action Situations (ASs) in a more holistic and integrated way and to identify all actors in the energy sector. This research need is especially important in the case of Lao PDR as the country is leaning on hydropower development to lift up the country from the list of Least Developed Countries (LDC) and to enhance socio-economic development and poverty eradication. This issue is vital also to many other Lower Mekong Basin countries (Cambodia, Myanmar, China, and Vietnam) as many of them are developing their hydropower potential.

More empirical research is also required on one of the core elements of IWRM – the issue of stakeholder participation and true empowerment of local, often poor people to get really involved in decentralised decision-making leading to more equitable and democratic water management. There is also a need to explore the obstacles to participation in more depth and to find more suitable mechanisms for successful participation and empowerment strategies.

This research has not discussed important issues related to regional issues and transboundary perspectives of IWRM to any great extent due to the focus on national IWRM in Lao PDR. However, these issues require more attention and research as the Mekong River is facing serious challenges due to increasing water demand by various water use sectors, population growth, climate change, urbanisation, and water pollution, as discussed in Chapter 3. Another issue that needs more concrete analysis and research is the scale of financial and human resources required to implement the policy recommendations discussed above.

References

- Akiba, S. (2010). *Evolution and demise of the Tennessee Valley Authority style regional development scheme in the Lower Mekong River Basin, 1951 to the 1990s: The First Asian initiative to pursue an opportunity for economic integration*. Waseda Business & Economic Studies 2010 No.4b. Retrieved from http://dspace.wul.waseda.ac.jp/dspace/bitstream/2065/33722/1/WasedaBusiness%26EconomicStudies_46_Akiba.pdf
- AMRC (2007). *Integrated water resources management in the Mekong*. Mekong Brief, No: 7. Australian Mekong Resource Centre, University of Sydney. Retrieved from http://sydney.edu.au/mekong/documents/mbrief7_iwrm.pdf
- Anderies, J. M., Janssen, M. A. & Ostrom, E. (2004). A framework to analyze the robustness of social-ecological systems from an institutional perspective. *Ecology and Society* 9(1), 18. Retrieved from <http://www.ecologyandsociety.org/vol9/iss1/art18/>
- Arhio, K. (2007). *Luova laatu ja laatuinnovaatiot oppivan verkoston tuottamina. Tapaustutkimus rakennuspuutuoteteollisuuden verkostosta*. Dissertation for the degree of Doctor of Science in Business and Economics. Jyväskylä Studies in Business and Economics 59. Jyväskylä: Jyväskylä University Printing House.
- ASEAN (2009). *The Official website of association of Southeast Asian Nations*. The ASEAN Secretariat. Retrieved from http://www.aseansec.org/about_ASEAN.html
- Asian Development Bank (2000a). *Environments in transition. Cambodia, Lao PDR, Thailand, Viet Nam*. Manila: Asian Development Bank.
- Asian Development Bank (2000b). *Lao People's Democratic Republic: 2001–2003. Country assistance plans*. Manila: Asian Development Bank.
- Asian Development Bank (2004a). *Lao People's Democratic Republic. Gender, Poverty and the Millennium Development Goals. Country Gender Strategy*. Manila: Asian Development Bank.
- Asian Development Bank (2004b). *Lao PDR: Water Resources Coordinating Committee. Country Paper*. Regional Meeting of National Water Sector Apex Bodies, Hanoi, May 18–21, 2004.

- Asian Development Bank (2005). *Evaluation for the agriculture and natural resources sector in the Lao People's Democratic Republic*. Sector assistance program evaluation. SAP: LAO 2005-17. Manila: Asian Development Bank, Operations Evaluation Department.
- Asian Development Bank (2007a). *The Asian water development outlook*. Manila: Asian Development Bank.
- Asian Development Bank (2007b). *Lao People's Democratic Republic: updating the National Water Policy and Strategy*. Technical Assistance Report, Project Number: 40193. Manila: Asian Development Bank.
- Asian Development Bank (2009a). *Asian Development Bank & Lao People's Democratic Republic*. Factsheet. Retrieved from http://www.adb.org/Documents/Fact_Sheets/LAO.pdf
- Asian Development Bank (2009b). *Asia development outlook. Rebalancing Asia's growth*. Manila: Asian Development Bank. Retrieved from <http://www.adb.org/Documents/Books/ADO/2009/LAO.pdf>
- Asian Development Bank (2010a). *Climate change in Southeast Asia: focused actions on the frontlines of climate change*. Manila: Asian Development Bank.
- Asian Development Bank (2010b). *Sector Assistance Program Evaluation for the Energy Sector in Lao People's Democratic Republic*. SAP: LAO 2010-42. Retrieved from <http://www.oecd.org/countries/laopeoplesdemocraticrepublic/47180387.pdf>
- Asian Development Bank (2010c). *Updating the National Water Resources Policy & Strategy*. TA 7013-LAO, Mid-Term Report, Volume 1, Main Report. Prepared by GHD Pty Ltd.
- Bach, H., Clausen, T.J., Dang, T.T., Emerton, L., Facon, T., Hofer, T. ... Whiting, L. (2011). *From local watershed management to integrated river basin management at national and transboundary levels*. Mekong River Commission, Lao PDR.
- Bandaragoda, D. J. (2000). *A framework for institutional analysis for water resources management in a river basin context*. Working Paper 5. Colombo, Sri Lanka: International Water Management Institute.
- Bandaragoda, D. J. (2005). *Stakeholder participation in developing institutions for integrated water resources management: Lessons from Asia*. Working Paper 96. Colombo, Sri Lanka: International Water Management Institute.
- Bandaragoda, D. J. (2006). *Status of institutional reforms for integrated water resources management in Asia: indications from policy reviews in five countries*. Working Paper 108. Colombo, Sri Lanka: International Water Management Institute (IWMI).

- Barker, R. & Molle, F. (2002, April). Perspectives on Asian Irrigation. Paper presented at *the Conference on Asian Irrigation in Transition – Responding to the Challenges Ahead*. Asian Institute of Technology Bangkok, Thailand. Retrieved from <http://www.iwmi.cgiar.org/Assessment/files/pdf/publications/ConferencePapers/AIT%20paper4.pdf>)
- Barlebo, H. (Ed.) (2006). *State-of-the-art Report with Users' Requirements for New IWRM Tools*. NeWater – New Approaches to Adaptive Water Management under Uncertainty (Contract no. 511179 (GOCE). Retrieved from http://www.newwater.info/deliverables/D421_report_040209.pdf
- Beeton, S. (2005). The Case study in tourism research: a multi-method case study approach. In B.W. Ritchie, P. Burns & C. Palmer (Eds.), *Tourism Research Methods: Integrating Theory With Practice* (pp. 37–48). Oxfordshire, UK: CABI Publishing.
- Bertelsmann Transformation Index Institute, (2006). *Country Report Laos*. Retrieved from <http://bti2006.bertelsmann-transformation-index.de/fileadmin/pdf/en/2006/AsiaAndOceania/Laos.pdf>
- Bertinelli, A. (2011). *Capturing community voices. Exploring people-oriented approaches in development initiatives in Lao P.D.R.* Field level resource kit. Adventist Development and Relief Agency, AusAid.
- Bestari, N., Mongcopa, C., Samson, J. & Ward, K. (Eds.) (2006). *Lao PDR: Governance issues in agriculture and natural resources. A Case study from the 2005 sector assistance program evaluation for the agriculture and natural resources sector in the Lao People's Democratic Republic*. Manila: Asian Development Bank.
- Biswas, A. (2008). Integrated water resources management: is it working? *International Journal of Water Resources Development*, 24(1), 5–22. doi: 10.1080/07900620701871718
- Borowski, I. & Kastens, B. (Eds.) (2009). *Adaptive Integrated Water Resources Management (AWM): Explicitly addressing today's challenges*. Results from NeWater. Freiburg: Pelzverlag. Retrieved from <http://www.newwater.info/>
- Boulapha, C. (2005, November). Integrated Water Resources Management in Lao PDR. Paper presented at *the International Forum on Integrated Management of the Mekong River Basin*, Chiangrai, Thailand.
- Boulapha, C. & Lyle, C. (2011). *Forming the Nam Ngum River Basin Committee*. Small Publications Series No. 35. Center for River Basin Organizations and Management (CRBOM). Retrieved from <http://crbom.org/SPS/Docs/SPS35-NN-RBC.pdf>
- Boulapha, C. & Philavong, O. (2011, October). Water planning in Lao PDR. Paper presented at *Water in the Green Economy in Practice: towards RIO+20*. UN-Water International Conference. Zaragoza, Spain.

- Boupha, S. (2000, September). The Current activities in environmental accounting and future plan in Lao PDR. Paper presented at *the Environmental and Economic Accounting*. Manila, Philippines. Retrieved from <http://www.nscb.gov.ph/peenra/workshop/Country%20Papers/Laos-f.pdf>
- Broderick, K. (2005). Communities in catchments: implications for natural resource management. *Geographical Research*, 43, 286–296. doi: 10.1111/j.1745-5871.2005.00328.
- Brown, K., Mackensen, J., Rosendo, S., Viswanathan, K., Cimarrusti, L., Fernando, K. ... & Perrin, F.W. (2005). Integrated Responses in K. Chopra, R. Leemans, P. Kumar & H. Simons (Eds.), *Ecosystems and Human Well-being: Policy Responses, Volume 3*. Findings of the Responses Working Group of the Millennium Ecosystem Assessment (pp. 425–465). Island Press: the Center for Resource Economics.
- Brühl, H. & Waters, M. (2009). Transboundary Cooperation in Action for Integrated Water Resources Management and Development in the Lower Mekong Basin in R. Lenton & M. Muller (Eds.), *Integrated Water Resources Management in Practice: Better Water Management* (pp. 189–204). London: Sterling, VA: Earthscan.
- Butterworth, J., Warner, J., Moriarty, P., Smits, S. & Batchelor, C. (2010). Finding practical approaches to Integrated Water Resources Management. *Water Alternatives*, 3(1), 68–81.
- Callander, T. (2007). *Environmental impacts of trade liberalization in the hydropower, mining and construction materials sectors, Lao PDR*. Environment Assessment Project (RTEA) – Background research paper. International Institute for Sustainable Development (IISD).
- Cap-Net (2005). *Integrated water resources management plans. Training manual and operational guide*. The Canadian International Development Agency (CIDA), the PAWD program & Partnership for African Waters Development. Retrieved from http://www.cap-net.org/sites/cap-net.org/files/Manual_english.pdf
- Cap-Net (2012). *IWRM tutorial*. Retrieved from http://www.archive.cap-net.org/iwrm_tutorial/mainmenu.htm
- Castro, E. (2011, June). The Water crisis is a crisis of governance: approaches to public policy research and water. Presentation at *The Research Training Course towards More Interdisciplinary and Diverse Research Approaches on Sustainable Water and Infrastructures (TISWA)*. Tampere University of Technology, Tampere, Finland.
- Cernea, M. & Meinzen-Dick, R. (1991). *Design for Water User Associations: organizational characteristics*. Report No. 27392. The World Bank, Environment Department. Retrieved from http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2005/08/04/000160016_20050804113752/Rendered/PDF/27392.pdf

- CIA World Factbook, (2010). *Laos economy profile 2010*. Retrieved from http://www.indexmundi.com/laos/economy_profile.html
- Claridge, G. F. (1996). *An Inventory of wetlands of the Lao PDR*. Bangkok: IUCN.
- Clemett, A., Soussan, J. & Mitchell, G. (2000). *Making Integrated Water Resources management (IWRM) work: lessons from the evaluation of water sector programmes*. (University of Leeds) Working Document. Retrieved from <http://www.euforic.org/iob/publ/workdocs/iwrm.pdf>
- Collentine, D., Forsman, Å., Galaz, V., Kallner Bastviken, S. & Ståhl-Delbanco, A. (2002). CATCH: Decision support for stakeholders in catchment areas. *Water Policy* 4(5), 447–63.
- Costanza, R., Kubiszewski, I., Paquet, P., King, K., Halimi, S., Sanguanngoi, H. ... & Morell, D. (2011). *Planning approaches for water resources development in the lower Mekong basin*. Portland State University, Portland, Oregon, USA & Mae Fah Luang University, Chiang Rai, Thailand.
- Creak, S. & Barney, K. (2012). Distressing developments in Laos. Retrieved from <http://asiapacific.anu.edu.au/newmandala/2012/12/23/distressing-developments-in-laos/>
- Cruz, R. V., Harasawa, H., Lal, M., Wu, S., Anokhin, Y., Punsalmaa, B. ...& Huu, Ninh, N. (2007). Asia. In M.L. Parry, O.F. Canziani, J.P. Palutikof, P.J. van der Linden & C.E. Hanson (Eds.), *Climate change 2007: impacts, adaptation and vulnerability. Contribution of Working Group II to the Fourth assessment report of the Intergovernmental Panel on Climate Change* (pp. 469–506). Cambridge: Cambridge University Press.
- Department of Energy Promotion and Development (EPD) (2009). Retrieved from <http://www.poweringprogress.org/>
- Department of Sustainable Development (DSD) (2011). *Risk management and adaptation to climate change*. Organization of American States. <http://www.oas.org/dsd/Working%20Documents/NaturalDisasterandland.htm>
- Dinar, A., Kemper, K., Blomquist, W. & Kurukulasuriya, P. (2006, July). The Process and performance of decentralization of river basin resource management: a global analysis. Selected paper for Presentation at *the American Agricultural Economics Association Annual Meeting*, Long Beach California.
- Dovers, S. (2001). Institutional barriers and opportunities: processes and arrangements for natural resource management in Australia. *Water and Science and Technology* 43(9), 215–226. IWA Publishing.

- Duffy, A. & Jefferies C. (2011). *Research report: developing a framework to guide urban water systems transitions*. SWITCH. Sustainable water management in the city of the future. Urban Water Technology Centre, University of Abertay Dundee. Retrieved from http://www.switchurbanwater.eu/outputs/pdfs/W1-3_GEN_MAN_D1.3.3_SWITCH_Transition_Framework.pdf
- Dukhovny, V., Mirzaev, N. & Sokolov, V. (2008). IWRM implementation: experiences with water sector reforms in Central Asia. In M. Rahaman & O. Varis (Eds.), *Central Asian waters: social, economic, environmental and governance puzzle*. Water & Development Publications, Helsinki University of Technology (pp. 19–31). Helsinki: Yliopistopaino.
- Dungumaro, E. & Madulu, N. (2002, October). Public participation in integrated water resources management: the case of Tanzania. Paper presented 3rd *Waternet/Warfsa Symposium “Water Demand Management for Sustainable Development”*. Dar es Salaam, Tanzania.
- Environmental Research Institute (2001). Public participation in development projects in Lao PDR. In N. Badenoch & M. Dupar (Eds.), *Mekong regional environmental governance: perspectives on opportunities and challenges* (pp. 52–58). Papers from the Mekong Regional Environmental Governance research and dialogue group. Resources Policy Support Initiative (REPSI).
- Eriksson, E. & Weber, K. (2008). Adaptive foresight: navigating the complex landscape of policy strategies. Future-Oriented Technology Analysis (FTA): Impact on Policy and Decision Making – The 2006 FTA International Seville Seminar. *Technological Forecasting and Social Change*, 75(4), 462–482. doi:10.1016/j.techfore.2008.02.006
- Eriksson, P. & Koistinen, K. (2005). *Monenlainen tapaustutkimus*. Kuluttajatutkimuskeskus, julkaisu 4:2005. Kerava: Savion Kirjapaino Oy. Retrieved from http://www.ncrc.fi/files/4957/2005_04_verkkojulkaisu_tapaustutkimus.pdf
- European Commission (EC) (2006). *EUR 22018 – directing the flow – a new approach to integrated water resources management*. Luxembourg: Office for Official Publications of the European Communities. Retrieved from http://ec.europa.eu/research/water-initiative/pdf/iwrm_060217_en.pdf
- European Union (2000). Water framework directive. Retrieved from http://europa.eu/legislation_summaries/agriculture/environment/l28002b_en.htm WEBPAGE
- European Union (2006). *LAO PDR – European Community Strategy Paper for the Period 2007–2013*. Retrieved from http://eeas.europa.eu/laos/csp/07_13_en.pdf
- European Union (EU) (2009). *Water sector development and governance: complementarities and synergies between sector-wide approach and integrated water resource management*. Reference Document No 7. Luxembourg: Publications Office of the European Union. doi: 10.2783/28621.

- FAO (2009). *Aquastat. Lao People's Democratic Republic*. Version 2010. Food and Agriculture Organisation of the United Nations. Retrieved from <http://www.fao.org/nr/water/aquastat/countries/laos/index.stm>
- Ganoulis, J. (2009). *Risk analysis of water pollution*. Weinheim: Wiley-VCH Verlag GmbH & Co. KGaA.
- Garcia, L. (2005). Review of the role of river basin organisations in Latin America. Paper prepared to the *World Commission on Dams*, for Thematic Review V.3: River basins-institutional frameworks and management options. Retrieved from <http://www2.wii.gov.in/eianew/eia/dams%20and%20development/kbase/contrib/ins225.pdf>
- Giupponi, C., Jakeman, A., Karssenber, D. & Hare, M.P. (2006). *Sustainable management of water resources. An integrated approach*. Cheltenham: Edward Elgar Publishing Limited.
- Global Environment Facility (GEF), WREA & United Nations Development Programme (UNDP) (2009). *Lao People's Democratic Republic: National Adaptation Plan for Action – NAPA*. Retrieved from <http://unfccc.int/resource/docs/napa/laos01.pdf>
- Global Water Partnership (2000). *Integrated water resources management*. Technical Advisory Committee, Background paper No. 4. Stockholm: Global Water Partnership Secretariat.
- Global Water Partnership (2003). *Integrated water resources management. Toolbox, version 2*. Stockholm: Global Water Partnership Secretariat.
- Global Water Partnership (2004). *Catalyzing change: A handbook for developing Integrated Water Resources Management (IWRM) and water efficiency strategies*. Background Paper No.5, DESA/DSD/2005/5.
- Global Water Partnership (2006, March). *Integrated Water Resources Management: strengthening local action*. Thematic document, Framework theme 2. *Fourth World Water Forum*. Mexico City.
- Global Water Partnership (2009a). *GWP ToolBox on integrated water resources management*. Global Water Partnership. Retrieved from <http://www.gwptoolbox.org/>
- Global Water Partnership (2009b). *How IWRM will contribute to achieving the MDGs?* Policy brief. Retrieved from http://www.gwpforum.org/gwp/library/Policy_brief_4_MDGs.pdf
- Global Water Partnership (2009c). *Lessons from Integrated Water Resources Management in practice*. Policy brief. Retrieved from http://www.gwpforum.org/gwp/library/GWP_Policy_brief9_English.pdf

- Global Water Partnership (2011). *Workplan 2012: Implementing the Strategy Executive Summary*. Retrieved from http://www.gwp.org/Global/Documents_And_Downloads/GWP%20Workplan%202012%20Vol%201%20Exec%20Sum%20v10.pdf
- GWP & INBO (2009). *A Handbook for Integrated Water Resources Management in basins*. Global Water Partnership (GWP) & the International Network of Basin Organizations (INBO), Sweden. Retrieved from http://www.gwptoolbox.org/images/stories/Docs/gwp_inbo%20handbook%20for%20iwrms%20in%20basins_eng.pdf
- The Government of Lao PDR (1996). *Law on Water and Water Resources*. Retrieved from <http://www.na.gov.la/docs/eng/laws/econ/Water%20and%20Water%20Resources%20%281996%29%20Eng.pdf>
- The Government of Lao PDR (1999). *Water Sector Strategy and Action Plan*. Water Resources Coordination Committee.
- The Government of Lao PDR (2003a) Lao People's Democratic Republic (2003). *Public Service Reform, People's Participation, Rule of Law and Sound Financial Management*. A Policy Paper of the Government of Lao PDR on Governance Issues. Roundtable Process, Vientiane, March 2003. Retrieved from <http://www.undplao.org/whatwedo/bgresource/demogov/Priority%20Areas%20for%20Gov%20Reform%20PolicyPaper.pdf>
- The Government of Lao PDR (2003b). *Prime Minister's Instruction*, PM 01/2000.
- The Government of Lao PDR (2004). *National Growth and Poverty Eradication Strategy (NGPES)*. Government of Lao PDR, Vientiane, Lao PDR. Retrieved from <http://www.undplao.org/newsroom/publication/Ngpes/Lao%20PDR%20-%20NGPES%20-%20Main%20Document.pdf>
- The Government of Lao PDR (2006). *The National Socio-Economic Development Plan 2006–2010 (NSEDP)*. Committee for Planning and Investment. Retrieved from <http://www.undplao.org/official%20docs/NSEDP%20partI.pdf>
- The Government of Lao PDR (2008). *The Strategic framework for national sustainable development strategy (NSDS) for Lao PDR*. Department of Planning, Ministry of Planning and Investment, Water Resources and Environment Administration & the United Nations Environment Programme. Retrieved from <http://chm.aseanbiodiversity.org/laopdr/Related%20Document/Lao%20NSDS%20report%20UNEP%28ENGLISH%29.pdf>
- The Government of Lao PDR (2009). *Report on the round table implementation meeting*. Ministry of Planning and Investment (MIP) & Department of International Cooperation. Vientiane, November 3, 2009. Retrieved from <http://www.rtm.org.la/documents/RTIM%202009/RTIM%202009%20Report%20FINAL%20FINAL%20PDF.pdf>

- The Government of Lao PDR (2010). *Draft the Seventh National Socio-Economic Development Plan (2011–2015)*. Executive summary. Ministry of Planning and Investment. Retrieved from <http://www.rtm.org.la/documents/DRAFT%20NSEDP%20EX%20SUMMARY%20MAY%202010.pdf>
- The Government of Lao PDR (2011a). *The Government of the Lao PDR Round Table Process*. Retrieved from <http://www.rtm.org.la/content/index.php>
- The Government of Lao PDR (2011b). *The Seventh Five-Year National Socio-Economic Development Plan (2011–2015)*. Ministry of Planning and Investment. Retrieved from http://www.la.undp.org/content/dam/laopdr/docs/Reports%20and%20publications/LA_7th%20NSEDP_Eng.pdf
- Gupta, A. (2001). Challenges and opportunities for water resources management in South-East Asia. *Hydrological Sciences-Journal-ées Sciences Hydrologiques*, 46(6), 923–935. doi: 10.1080/02626660109492886
- Hassing, J., Ipsen, N., Clausen, T., Larsen, H. & Lindgaard-Jørgensen, P. (2009). *Integrated water resources management (IWRM) in action*. The United Nations World Water Assessment Programme. Dialogue Paper. DHI Water Policy and UNEP-DHI Centre for Water and Environment.
- Hoff, H. (2011). *Understanding the nexus*. Background Paper for the Bonn2011 Conference: the Water, Energy and Food Security Nexus. Stockholm: Stockholm Environment Institute. Retrieved from http://www.water-energy-food.org/documents/understanding_the_nexus.pdf
- Hooper, B. (2005). *Integrated river basin governance: learning from international experiences*. London: IWA Publishing.
- Hukka, J., Juuti, P., Katko, T. & Seppälä, O. (2006). Many Ps needed for sustainable water services – expansion of the scope of public-private partnerships. *Public Works Management & Policy*, 11(2), 104–109. doi: 10.1177/1087724X06294063
- Hussey, K. & Pittock, J. (2012). The Energy–water nexus: managing the links between energy and water for a sustainable future. *Ecology and Society*, 17(1), 31. <http://dx.doi.org/10.5751/ES-04641-170131>
- Häikiö, L. & Niemenmaa, V. (2007). Tapauksen löytäminen ja rajaaminen. In M. Laine, J. Bamberg & P. Jokinen (Eds.), *Tapaustutkimuksen taito* (pp. 41–56). Helsinki: Gaudeamus Helsinki University Press.
- International Conference on Freshwater (2001). *Water-key to sustainable development: recommendations for action*. Bonn, Germany.
- International Conference on Water and the Environment (1992). *Dublin statement and report of the conference*. Retrieved from <http://www.wmo.int/pages/prog/hwrp/documents/english/icwedece.html>

- International Hydropower Association (IHA) (2004). *Sustainability guidelines*. Retrieved from www.hydropower.org/downloads/IHA%20Sustainability%20Guidelines_Feb04.pdf
- International Monetary Fund (2006). *Lao People's Democratic Republic: selected issues and statistical appendix*. IMF country report No. 06/398. Washington, DC: International Monetary Fund.
- International Water Management Institute (IWMI) (2006). *Water Governance in the Mekong Region: the need for more informed policy-making*. Water policy briefing. Retrieved from http://www.iwmi.cgiar.org/Publications/Water_Policy_Briefs/PDF/WPB22.pdf
- International Water Management Institute (IWMI) (2007). *IWRM challenges in developing countries: lessons from India and elsewhere*. Water policy briefing. Retrieved from http://www.iwmi.cgiar.org/Publications/Water_Policy_Briefs/PDF/WPB24.pdf
- Ioris, A. (2008). The limits of integrated water resources management: a case study of Brazil's Paraíba do Sul River Basin. *Science, Practice and Policy*, 4(2), 1–11. <http://sspp.proquest.com/archives/vol4iss2/0803-007.ioris.html>
- Jeffrey, P. & Gearey, M. (2006). Integrated water resources management: lost on the road from ambition to realisation? *Water Science & Technology*, 53(1), 1–8. IWA Publishing.
- Jick, T.D. (2006). Mixing qualitative and quantitative methods: triangulation in action. *Administrative Science Quarterly*, 24(4), 602–611. <http://links.jstor.org/sici?sici=0001-8392%218%209791%202%2924%3A4%3C602%3AMQAQMT%3E2.O.C0%3B2-Q>
- Jønch-Clausen, T. (2004). "... *Integrated Water Resources Management (IWRM) and water efficiency plans by 2005*" why, what and how? The Global Water Partnership. Sweden: Elanders Infologistics Väst AB. Retrieved from <http://cap-net.org/sites/cap-net.org/files/TEC%2010.pdf>
- Jønch-Clausen, T. (2011). *Scoping and planning of the MWD integrated water resources management (IWRM) and river basin management (RBM) component in Lao PDR and Thailand*. Final Report. Mekong water dialogue. Retrieved from http://cmsdata.iucn.org/downloads/scoping_and_planning_of_the_mwd_iwrm_and_rbm_final_report_30_august.pdf
- Jønch-Clausen, T. & Fugl, J. (2001). Firming up the conceptual basis of integrated water resources management. *International Journal of Water Resources Development*, 17(4), 501–510.
- Jones, T., Newborne, P. & Phillips, B. (2006). *Applying the principles of integrated water resource and river basin management – an introduction*. Report to WWF-UK.

- Katko, T. & Rajala, R. (2005). Priorities for Fresh Water Use Purposes in Selected Countries with Policy Implications. *Water Resources Development*, 21(2), 311–323.
- Kemper, K., Dinar, A. & Blomquist, W. (Eds.) (2005). *Institutional and policy analysis of river basin management decentralisation. The Principle of managing water resources at the lowest appropriate level – when and why does it (not) work in practice?* Washington: World Bank.
- Keskinen, M. (2010). *Bringing back the common sense? Integrated approaches in water management: lessons learnt from the Mekong*. Dissertation for the degree of Doctor of Science in Technology. Water & Development Publications – Aalto University, TKK-WD-09. Helsinki: Yliopistopaino.
- King, E. & van de Walle, D. (2010). Laos: Ethno-linguistic diversity and disadvantage. In G. Hall & H. Patrinos (Eds.), *Indigenous Peoples, Poverty and Development* (pp. 224–273). Cambridge University Press.
- Komany, S. (2010). Personal communication. Head of Water Policy and Legislation Division, Department of Water Resources, WREA, August 20, 2010, Vientiane, Lao PDR.
- Lahtela, V. (2002). *Integrated water resources management in West Africa – a framework for analysis*. Thesis for the degree of Licentiate of Technology. Water Resources Laboratory, Helsinki University of Technology, Espoo, Finland.
- Laine, M., Bamberg, J. & Jokinen, P. (Eds.) (2007). *Tapaustutkimuksen taito*. Helsinki: Gaudeamus Helsinki University Press.
- Lawrence, S. (Ed.) (2008). *Power surge. The impacts of rapid dam development in Laos*. Berkely, CA: International Rivers.
- Lebel, L., Garden, P. & Imamura, M. (2005). The politics of scale, position, and place in the governance of water resources in the Mekong region. *Ecology and Society*, 10(2), 18. Retrieved from <http://www.ecologyandsociety.org/vol10/iss2/art18/>
- Leino, H. (2007). Yleinen ongelma, yksi tapaus. In M. Laine, J. Bamberg & P. Jokinen (Eds.), *Tapaustutkimuksen taito* (pp. 214–227). Helsinki: Gaudeamus Helsinki University Press.
- Leung, S., Thanh, V. & Reat, K. (2005). *Integration and transition – Vietnam, Cambodia and Lao PDR*. International and Development Economics Working Paper 05-1. Asia Pacific School of Economics and Government, the Australian National University. Retrieved from <https://digitalcollections.anu.edu.au/bitstream/1885/42584/2/IDEC05-1.pdf>
- Litvack, J., Ahmad, J. & Bird, R. (1998). *Rethinking decentralization in developing countries*. Sectors studies series. Washington, DC: The World Bank.
- Loucks, D. & Gladwell, J. (1999). *Sustainability criteria for water systems*. International Hydrology Series. UNESCO/IHP Project M-4.3. Cambridge: University Press.

- Lovell, C., Mandondo, A. & Moriarty, P. (2002). The question of scale in integrated natural resource management. *Conservation Ecology*, 5(2), 25. Retrieved from <http://www.consecol.org/vol5/iss2/art25/>
- Martinez-Vazquez, J. Gomes, J. & Yao, G. (2006). *Fiscal decentralisation in the Lao People's Democratic Republic*. Working paper 06-22. International Studies Program. Andrew Young School of Policy Studies, Georgia State University. Retrieved from <http://aysps.gsu.edu/isp/files/ispwp0622.pdf>
- Medema, W. & Jeffrey, P. (2005). *IWRM and adaptive management: synergy or conflict?* Report of the NeWater project – New Approaches to Adaptive Water Management under Uncertainty. Retrieved from http://www.newater.uos.de/deliverables/D111_final%20draft.pdf
- Mekong River Commission (2005). *Overview of the hydrology of the Mekong Basin*. The Mekong River Commission, Vientiane, Lao PDR.
- Mekong River Commission (2009). *IWRM-Based Basin Development Strategy for the Lower Mekong Basin*. Incomplete Consultation Draft No. 1 – October 2009. Mekong River Commission. Retrieved from <http://www.mrcmekong.org/download/programmes/bdp/IWRM-based-Basin-Dev-Strategy-1st-Incomplete-Con-Draft6Oct09.pdf>
- Mekong River Commission (2010a). *Mekong Integrated Water Resource Management Project (MIWRM). Initial Environmental and Social Examination (IESE)*. Retrieved from http://www.wrea.gov.la/wrea/images/stories/pdf/EAP_IESE%20Final_P104806.pdf
- Mekong River Commission (2010b). *Mekong River Commission Strategic Plan 2011–2015*. Retrieved from <http://www.mrcmekong.org/assets/Publications/strategies-workprog/Stratigic-Plan-2011-2015-council-approved25012011-final-.pdf>
- Mekong River Commission (2010c). *State of the basin report 2010*. Mekong River Commission, Vientiane, Lao PDR.
- Mekong River Commission (MRC) (2011a). *About the Mekong*. Retrieved from http://www.mrcmekong.org/about_mekong/about_mekong.htm
- Mekong River Commission (2011b). *MRC work programme 2011*. Retrieved from <http://www.mrcmekong.org/assets/Publications/strategies-workprog/work-program-11.pdf>
- Mekong River Commission Secretariat (2011). *Visit of the Mekong River Commission to the Mississippi River Commission, 4–14 June, 2011*. Background information and short biography of MRC delegates. Retrieved from <http://lowermekong.org/sites/default/files/MEKONG%20RC%20BIO%27s%20and%20MeRC%20overview.pdf>

- Mekong River Commission & German Agency for Technical Cooperation (GTZ) (2007). *Watershed management resource kit*. Working Document. Module 3: Institutions and Organisations. Retrieved from <http://www2.gtz.de/snrd/wmrk/#SearchMe>
- Mekong River Commission and International Center for Environmental Management (ICEM) (2010). *MRC SEA for hydropower on the Mekong mainstream. Avoidance, enhancement & mitigation assessment*. Summary working paper for discussion at regional workshop. Retrieved from <http://www.mrcmekong.org/assets/Publications/Consultations/SEA-Hydropower/SEA-MAR-summary-23June-final-ver-response-toMRCcomment-v2.pdf>
- Merrey, D. J., Meinzen-Dick, R., Mollinga, P.P., Karar, E., Huppert, W., Rees, J. ... & van der Zaag, P. (2007). Policy and institutional reform: the art of the possible. In D. Molden (Ed.), *Water for Food, Water for Life: A Comprehensive Assessment of Water Management in Agriculture* (pp. 193–231). London, UK: Earthscan; Colombo, Sri Lanka: IWMI.
- Messerli, P., Heinimann, A., Epprecht, M., Phonesaly, S., Thiraka, C. & Minot, N. (Eds.) (2008). *Socio-economic atlas of the Lao PDR – an analysis based on the 2005 population and housing census*. Bern: Swiss National Center of Competence in Research (NCCR) North-South, University of Bern & Vientiane: Geographica Bernensia.
- Middleton, C. (2008). Perspective from the Mekong region: new financiers and familiar problems. In P. Bosshard (Ed.), *New Financiers and the Environment, Ten Perspectives on How Financial Institutions Can Protect the Environment* (pp. 12–15). USA, Berkley: International Rivers.
- Ministry of Agriculture and Forestry (MAF) (2010). *Agricultural development strategy 2020*. Final Draft. Vientiane, Lao PDR.
- Ministry of Agriculture and Forestry (MAF) & United Nations Development Programme (UNDP). (2010). *Accelerating Progress towards the MDGs Innovative options for reaching the unreached Lao People's Democratic Republic*. Retrieved from http://www.la.undp.org/content/dam/laopdr/docs/Reports%20and%20publications/MAF%20Report_Lao%20PDR_September%202010.pdf
- Mody, J. (2004). *Achieving Accountability through decentralisation: lessons for integrated river basin management*. World Bank Policy Research Working Paper 3346. Retrieved from [http://www-wds.worldbank.org/servlet/WDSContentServer/WDSID=IB/2004/07/23/000112742_20040723110731/Rendered/PDF/wps3346.pdf](http://www-wds.worldbank.org/servlet/WDSContentServer?WDSID=IB/2004/07/23/000112742_20040723110731/Rendered/PDF/wps3346.pdf)

- Moench, M., Dixit, A., Janakarajan, S., Rathore, M. S. & Mudrakartha, S. (2003). *The Fluid mosaic: water governance in the context of variability, uncertainty and change* (a synthesis paper). Kathmandu: Nepal Water Conservation Foundation & Colorado: The Institute for Social and Environmental Transition. Retrieved from http://wur.academia.edu/SrinivasMudrakartha/Papers/941286/Fluid_mosaic_water_governance_in_the_context_of_variability_uncertainty_and_change_a_synthesis_paper
- Molle, F. (2005). *Irrigation and water policies in the Mekong region: Current discourses and practices*. Research report 95. Colombo: International Water Management Institute.
- Molle, F. (2008). Nirvana concepts, narratives and policy models: Insight from the water sector. *Water Alternatives* 1(1), 131–156.
- Moriarty, P. B., Batchelor, C.H., Laban, P. & Fahmy, H. (2010). Developing a practical approach to 'light IWRM' in the Middle East. *Water Alternatives* 3(1), 122–136.
- Mostert, E. (Ed.) (2003). *Public participation and the European Water Framework Directive: a framework for analysis*. Delft: Delft University of Technology. Retrieved from www.harmonicop.uni-osnabrueck.de/_files/_down/HarmoniCOPinception.pdf
- Mostert, E., Pahl-Wostl, C., Rees, Y., Searle, B., Tàbara, D., & Tippet, J. (2007). Social learning in European river basin management; Barriers and fostering mechanisms from 10 river basins. *Ecology and Society* 12(19). Retrieved from <http://www.ecologyandsociety.org/vol12/iss1/art19/>
- Mukhtarov, F.G. (2007, March). Integrated water resources management from a policy transfer perspective. *Proceedings of the International Congress on River Basin Management* (pp. 610–625). State Hydraulic Works of Turkey and World Water Council, Antalya.
- North, D. (1990). *Institutions, institutional change, and economic performance*. Cambridge, UK: Cambridge University Press.
- Osborne, M. (2004). *River at risk. The Mekong and the water politics of Southeast Asia*. Lowy Institute Paper 02. Lowy Institute for International Policy. Double Bay: Longueville Media.
- Ostberg, S. (2008). *Lao PDR/Laos – a country analysis*. PlanDoLearn – International Cooperation. Retrieved from http://www.forumsyd.org/upload/Delade_dokument/Omv%C3%A4rldsanalyser/Laos_Country_Analysis_2008.pdf
- Ostrom, E. (1990). *Governing the commons: the evolution of institutions for collective action*. New York: Cambridge University Press.
- Ostrom, E. (1992). *Crafting institutions for self-governing irrigation systems*. Institute for Contemporary Studies, Center for Self-Governance. San Francisco, California. Retrieved from http://pdf.usaid.gov/pdf_docs/PNABL484.pdf

- Ostrom, E. (1994, June). Neither market nor state: governance of common-pool resources in the twenty-first century. Lecture presented at *the Workshop in Political Theory and Policy Analysis*. Lecture Series No. 2. Washington, DC: International Food Policy Research Institute. Retrieved from http://dlc.dlib.indiana.edu/dlc/bitstream/handle/10535/891/ostrom-E-neither_market_nor_state_governance_of_common_pool_resources_in_the_twenty_first_century.pdf?sequence=1
- Ostrom, E. (2002). Common-pool resources and institutions: toward a revised theory. In B. Gardner & G. Rauser (Eds.), *Handbook of Agricultural Economics*, Volume 2 (pp. 1315–1339). doi: 10.1016/S1574-0072(02)10006-5
- Ostrom, E. (2005). *Understanding institutional diversity*. Report on conceptual framework for science-policy barriers and bridges. New Jersey: Princeton University Press.
- Ostrom, E. (2007). The Governance challenge: matching institutions to the structure of social-ecological systems. Workshop in Political Theory and Policy Analysis, Indiana University, Center for the Study of Institutional Diversity, Arizona State University. Forthcoming in S. Levin, the *Princeton Guide to Ecology*. Princeton, NJ: Princeton University Press. Retrieved from <http://www.indiana.edu/~workshop/publications/materials/W07-13.pdf>
- Ostrom, E. (2011). Background on the institutional analysis and development framework. *Policy Studies Journal*, 39(1), 7–27. doi: 10.1111/j.1541-0072.2010.00394.x
- Pahl-Wostl, C. (2007a). The implications of complexity for integrated resources management. *Environmental Modelling & Software*, 22(5), 561–569. doi: <http://dx.doi.org/10.1016/j.envsoft.2005.12.024>
- Pahl-Wostl, C. (2007b). Requirements for adaptive water management. In C. Pahl-Wostl, P. Kabat & J. Möltgen (Eds.), *Adaptive and Integrated Water Management. Coping with Complexity and Uncertainty* (pp. 1–22). Springer Verlag.
- Pahl-Wostl, C. (2009). A conceptual framework for analysing adaptive capacity and multi-level learning processes in resource governance regimes. *Global Environmental Change*, 19(3), 354–365. doi:10.1016/j.gloenvcha.2009.06.001
- Pahl-Wostl, C., Holtz, G., Kastens, B. & Knieper, C. (2010). Analyzing complex water governance regimes: the management and transition framework. *Environmental Science & Policy* 13(7), 571–581. doi: 10.1016/j.envsci.2010.08.006
- Pahl-Wostl, C., Huntjens, P., Möltgen, J., Brugnach, M., van Raak, R., van der Brugge, R., Mysiak, J., Farmaci, R. & Giordano, R. (2007a). *Integrated transition framework and evaluation of tools*. Report of the NeWater project – New Approaches to Adaptive Water Management under Uncertainty.

- Pahl-Wostl, C., Isendahl, N., Möllenkamp, S., Brugnach, M., Jeffrey, P., Medema, W. & Tessa de Vries, T. (2006). *Paradigms in water management*. Report of the NeWater project – New Approaches to Adaptive Water Management under Uncertainty. Retrieved from <http://www.newater.uni-osnabrueck.de/deliverables/D112.pdf>
- Pahl-Wostl, C., Jeffrey, P., Isendahl, N. & Brugnach, M. (2011). Maturing the new water management paradigm: progressing from aspiration to practice. *Water Resources Management*, 25(3), 837–856. doi: 10.1007/s11269-010-9729-2
- Pahl-Wostl, C., Möltgen, J., Sendzimir, J. & Kabat, P. (2005). *New methods for adaptive water management under uncertainty – The NeWater project*. Retrieved from <http://www.newater.info/index.php?pid=1020>
- Pahl-Wostl, C. & Sendzimir, J. (2005). *The Relationship between IWRM and adaptive water management*. NeWater Working Paper 3. Retrieved from www.newater.info.
- Pahl-Wostl, C., Sendzimir, J., Jeffrey, P., Aerts, J., Berkamp, G. & Cross, K. (2007b). Managing change toward adaptive water management through social learning. *Ecology and Society*, 12(2), 30. <http://www.ecologyandsociety.org/vol12/iss2/art30/>
- Parry, M.L., Canziani, O.F., Palutikof, J.P., van der Linden, P.J. & Hanson, C.E. (Eds.) (2007). *Contribution of working group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC)*. Cambridge: Cambridge University Press.
- Peltola, T. (2007). Empirian ja teorian välinen vuoropuhelu. In M. Laine, J. Bamberg & P. Jokinen (Eds.), *Tapaustutkimuksen taito* (pp. 111–129). Helsinki: Gaudeamus Helsinki University Press.
- Pheddara, P. (2003, February). Water rights in Lao PDR. *International Working Conference on Water Rights: Institutional Options for Improving Water Allocation*, Hanoi, Vietnam.
- Philavong, O. (2011, October). IWRM Evaluation Results in Lao PDR. Presentation at *GWP Southeast Asia*.
- Philip, R., Anton, B., Cox, D., Smits, S., Sullivan, C. A., Chonguiça, E. ... & Berraondo López, M. (2008). *Local government and integrated water resources management (IWRM)*. Part II: Understanding the Context – The Role of Local Government in IWRM. Cape Town: ICLEI – Local Governments for Sustainability, Africa Secretariat.
- Pholsena, K. Personal communication. (2010). Minister to the Prime Minister's Office, Head of Water Resources and Environment Administration, Chairperson of the Lao National Mekong Committee, August 26, 2010, Vientiane, Lao PDR.

- Polski, M. & Ostrom, E. (1999). *An Institutional Framework for Policy Analysis and Design*. Workshop in Political Theory and Policy Analysis. Retrieved from <http://mason.gmu.edu/~mpolski/documents/PolskiOstromIAD.pdf>
- Poppe, M. (2004). *Integrated watershed management planning in the Lower Mekong Basin. A Comparative analysis of national and local planning systems in Cambodia, Lao PDR, Thailand and Viet Nam*. Working Paper 11. MRC-GTZ Cooperation Programme Agriculture, Irrigation and Forestry Programme Watershed Management Component.
- Porter, I. & Shivakumar, J. (Eds.) (2011). *Doing a dam Better: the Lao People's Democratic Republic and the story of Nam Theun 2*. World Bank. Retrieved from <http://issuu.com/world.bank.publications/docs/9780821369852>
- Rahaman, M. (2009). *Integrated water resources management: constraints and opportunities with a focus on the Ganges and the Brahmaputra river basins*. Dissertation for the degree of Doctor of Science in Technology. Water & Development Publications – Helsinki University of Technology. Helsinki: Yliopistopaino.
- Rahaman, M. & Varis, O. (2005). Integrated water resources management: evolution, prospects and future challenges. *Sustainability: Science, Practice, & Policy*, 1(1), 15–21. Retrieved from <http://archives/vol1iss1/0407-03.rahaman.html>
- Ramsar Convention Secretariat (2007). *River basin management: Integrating wetland conservation and wise use into river basin management*. Ramsar handbooks for the wise use of wetlands, 3rd edition, vol. 7. Gland, Switzerland: Ramsar Convention Secretariat.
- Ramsar Convention Secretariat (2010). *River basin management: Integrating wetland conservation and wise use into river basin management*. Ramsar handbooks for the wise use of wetlands, 4th edition, vol. 9. Gland, Switzerland: Ramsar Convention Secretariat.
- Rogers, P. & Hall, A. (2003). *Effective water governance*. TEC Background Papers No. 7. Global Water Partnership Technical Committee. Stockholm: GWP Secretariat.
- Rondinelli, D. (1981). Government decentralization in comparative perspective: theory and practice in developing countries. *International Review of Administrative Sciences*, XLVII(2), 133–145.
- Rondinelli, D., McCullough, J. & Johnson, R. (1989). Analysing decentralization policies in developing countries: a political-economy framework. *Development and Change*, 20(1), 57–87. doi: 10.1111/j.1467-7660.1989.tb00340.x

- Roy, D., Barr, J. & Venema, H.D. (2011). *Ecosystem approaches in integrated water resources management (IWRM). A Review of transboundary river basins*. United Nations Environment Programme and the International Institute for Sustainable Development. Retrieved from http://www.unepdhi.org/~media/Microsite_UNEPDHI/Publications/documents/unep_DHI/Ecosystem%20Approaches%20in%20Integrated%20Water%20Resources%20Management.ashx
- Savas, E. S. (2005). Privatisation and public-private partnerships. Adapted from E. S. Savas, *Privatization in the City: Successes, Failures, Lessons*. Washington, DC: CQ Press. Retrieved from http://www.cesmadrid.es/documentos/sem200601_MD02_IN.pdf
- Schlüter, M., Hirsch, D. & Pahl-Wostl, C. (2010). Coping with change: responses of the Uzbek water management regime to socio-economic transition and global change. *Environmental Science & Policy* 13(7), 620–636. doi: 10.1016/j.envsci.2010.09.001
- Science Technology and Environment Agency (STEA) (2006). *National policy. Environmental and social sustainability of the hydropower sector in Lao PDR*. Lao Environment and Social Project, Lao People's Democratic Republic.
- Sisouphanthong, B. (2010). Personal communication. Vice Minister of Ministry of Planning and Investment, August 24, 2010, Vientiane, Lao PDR.
- SIWI (2001). *Recommendation: water management in developing countries – policy and priorities for EU development cooperation*. A Background document for an EC communication on water and development. Stockholm: Stockholm International Water Institute (SIWI).
- Smits, S., Bustamante, R & Butterworth, J. (2006). Integrated water resources management at the local level: the role of local government. LoGo Water – Local Governments & Integrated Water Resources Management in Southern Africa Project paper. Retrieved from http://logowater.iclei-europe.org/fileadmin/user_upload/logowater/resources/Local_govt_and_IWRM_Smits-Bustamante-Butterworth.pdf
- Stuart-Fox, M. (2005). *Politics and reform in the Lao People's Democratic Republic*. Working Paper No.126. The Asia Research Centre & University of Queensland. Retrieved from <http://www.warc.murdoch.edu.au/publications/wp/wp126.pdf>
- Than, M. & Tan, J. (Eds.) (1997). *Laos' Dilemmas and Options: The challenge of economic transition in the 1990s*. Institute of Southeast Asian Studies. Singapore: Seng Lee Press Pte Ltd.
- Ti, H. & Facon, T. (2004). *From vision to action. A Synthesis of experiences in least-developed countries in Southeast Asia*. The FAO-ESCAP Pilot Project on National Water Visions, RAP Publication 2004/32. Retrieved from <ftp://ftp.fao.org/docrep/fao/008/ae546e/ae546e00.pdf>

- Turner, S., Pangare, G. & Mather, R.J. (Eds.) (2009). *Water Governance: A situational analysis of Cambodia, Lao PDR and Viet Nam*. Mekong Region Water Dialogue Publication No. 2. Gland: IUCN.
- United Nations (1992a). *Agenda 21*. United Nations Conference on Environment & Development, Rio de Janeiro, Brazil, 3–14 June 1992.
- United Nations (1992b). *Dublin Statement*. United Nations Conference on Environment and Development, Rio de Janeiro in June 1992.
- United Nations (2001). *Lao People's Democratic Republic. Report on implementation of the Brussels Programme of Action for the Least Developed Countries (2001–2010)*. Retrieved from <http://www.un.org/wcm/webdav/site/ldc/shared/Laos%20PDR.pdf>
- United Nations (2005). *Lao People's Democratic Republic, public administration, country profile*. Division for Public Administration and Development Management (DPADM), Department of Economic and Social Affairs (DESA). Retrieved from <http://unpan1.un.org/intradoc/groups/public/documents/un/unpan023237.pdf>
- UNDP (2006). *Human development report*. United Nations Development Programme. Retrieved from <http://hdr.undp.org/hdr2006/>
- UNDP (2007). *Assessment of development results. Evaluation of UNDP's contribution*. Lao PDR. United Nations Development Programme (UNDP), Evaluation office. Retrieved from http://web.undp.org/evaluation/documents/ADR/ADR_Reports/ADR_Laos.pdf
- UNDP (2009). *Effective water governance*. United Nations Development Programme (UNDP). Retrieved from <http://www.undp.org/water/>
- UNDP (2010). *New possibilities for civil society organisations*. United Nations Development Programme. Press release, April 1, 2010. Retrieved from http://www.undplao.org/newsroom/NGO_legislation.php
- UNDP & SIWI (2012). *Clarifying roles of water institutions*. Water Governance Facility. United Nations Development Programme & The Stockholm International Water Institute (SIWI). Retrieved from <http://www.watergovernance.org/sa/node.asp?node=854>
- United Nations Environment Programme (UNEP), Regional Resource Centre for Asia and the Pacific, Norwegian Agency for Development Cooperation & Lao People's Democratic Republic Science Technology and Environment Agency (STEA) (2001). *Lao PDR: State of the Environment*. Pathumthani: UNEP. Retrieved from <http://www.rrcap.unep.org/pub/soe/laosoe.cfm>
- UNESCO (2012). *Country Programming Document (UCPD) for the Lao People's Democratic Republic*. Retrieved from <http://unesdoc.unesco.org/images/0021/002176/217684e.pdf>

- UNESCO-WWAP (2003). *Water for people, water for life*. The United Nations World Water Development Report, the United Nations World Water Assessment Programme (WWAP), United Nations Educational, Scientific and Cultural Organization (UNESCO) and Berghahn Books.
- UNESCO-WWAP (2006). *Water – a shared responsibility*. The United Nations World Water Development Report 2, the United Nations World Water Assessment Programme (WWAP), United Nations Educational, Scientific and Cultural Organization (UNESCO) and Berghahn Books.
- UNESCO-WWAP (2009). *Water in a Changing World*. The United Nations World Water Development Report 3, the United Nations World Water Assessment Programme (WWAP), United Nations Educational, Scientific and Cultural Organization (UNESCO) and Earthscan.
- UNESCO-WWAP (2012). *Managing Water under Uncertainty and Risk*. The United Nations World Water Development Report 4, the United Nations World Water Assessment Programme (WWAP). Paris: United Nations Educational, Scientific and Cultural Organization (UNESCO).
- UN-Water (2007). *Managing water resources towards 2015*. Conference Summary. International Conference in Copenhagen, 13 April 2007, Copenhagen Initiative on Water and Development. <http://www.unepdhi.org/MWR2015/Conference%20Summary%20Final.pdf>
- UN-Water (2008). *Status report on IWRM and water efficiency plans for CSD16*. Prepared for the 16th session of the Commission on Sustainable Development – May 2008, Task Force on IWRM Monitoring and Reporting, UN-Water. Retrieved from http://www.unwater.org/downloads/UNW_Status_Report_IWRM.pdf
- UN-Water (2010). *Climate change adaptation: the pivotal role of water*. Policy brief. Retrieved from http://www.unwater.org/downloads/unw_ccpol_web.pdf
- UN-Water & GWP (2007). *Roadmapping for advancing integrated water resources management (IWRM) processes*. UN-Water and the Global Water Partnership (GWP).
- UN-WWDR (2009). *The United Nations World Water Development Report 3: water in a changing world*. World Water Assessment Programme. Paris: UNESCO & London: Earthscan.
- van der Keur, P., Henriksen, H. J., Refsgaard, J. C., Brugnach, M., Pahl-Wostl, C., Dewulf, A. & Buiteveld, H. (2006). *Identification of major sources of uncertainty in current IWRM practice and integration into adaptive management*. Report of the NeWater project – New Approaches to Adaptive Water Management under Uncertainty.

- van Hofwegen, P. (2000). Framework for assessment of institutional frameworks for integrated water resources management. In C. Abernethy (Ed.), *Integrated Water Management in Water-Stressed River Basins in Developing Countries: Strategies for Poverty Alleviation and Agricultural Growth* (pp. 137–158). Colombo: International Water Management Institute (IWMI) and German Foundation for International Development (DSE).
- Varis, O., Keskinen, M., Kummu, M. (2008a). Mekong at the crossroads. *Ambio* 37(3), 146–149.
- Varis, O., Rahaman, M. & Stucki, V. (2008b). Integrated water resources management plan: the key to sustainability. In M. Kummu, M. Keskinen & O. Varis (Eds.), *Modern Myths of the Mekong* (pp. 173–183). Water & Development Publications – Helsinki University of Technology. Helsinki: Yliopistopaino.
- Vermillion, D. L. 1997. *Impacts of irrigation management transfer: a review of the evidence*. Research report 11. Colombo, Sri Lanka: International Irrigation Management Institute.
- VI World Water Forum (2012). *The 6th World Water Forum*. Marseille, France, 12–17 March 2012. Retrieved from <http://www.worldwaterforum6.org/en/commissions/regional/asia-pacific-region/?id=117>
- Vientiane Times, (2010, March 5). Issue 54.
- Vientiane Times, (2010, March 3). Issue 55.
- Viraphong, V. (2010). Personal communication. Director General of the Laos's Department of Electricity, Ministry of Energy and Mines, August 23, 2010, Vientiane, Lao PDR.
- WEPA (2009). *Outlook of water environmental management strategies in Asia*. Water Environment Partnership in Asia (WEPA), Ministry of the Environment, Japan & Institute for Global Environmental Strategies (IGES). Kanagawa: IGES.
- WEPA (2012). *State of water environmental issues Lao PDR*. Water Environment Partnership in Asia (WEPA). Retrieved from <http://www.wepa-db.net/policies/state/laos/groundwater.htm>
- WEPA & IGES (2012). *Outlook on water environmental management in Asia 2012*. Water Environment Partnership in Asia (WEPA), Ministry of the Environment, Japan & Institute for Global Environmental Strategies (IGES). Retrieved from <http://www.wepa-db.net/pdf/1203outlook/01.pdf>
- Winter, M. (2002). *Lao PDR: fact finding mission report*. Report prepared for UNCDF. Retrieved from http://www.uncdf.org/english/local_development/uploads/other/fact-finding_mission_mwinter1.pdf

- Wolcott, H.F. (1992). Posturing in Qualitative Research. In M.D. LeCompte, W.L. Millroy & J. Pressile (Eds.), *The Handbook of Qualitative Research in Education* (pp. 3–52). San Diego, CA: Academic Press.
- Von Korff, Y., Daniell, K.A., Moellenkamp, S., Bots, P. & Bijlsma, R.M. (2012). Implementing participatory water management: recent advances in theory, practice, and evaluation. *Ecology and Society* 17(1), 30. <http://dx.doi.org/10.5751/ES-04733-170130>
- World Bank (2005). *The Lao environment monitor 2005*. Washington: World Bank.
- World Bank (2007). *Strategic environmental assessment and integrated water resources management and development*. Washington: World Bank, Economic and Sector Work, Environment Department.
- World Bank (2009a). *Directions in hydropower*. Retrieved from http://siteresources.worldbank.org/INTWAT/Resources/Directions_in_Hydropower_FINAL.pdf
- World Bank (2009b). *Project appraisal document on a proposed grant in the amount SDR 5.0 Million (US\$5.0 Million equivalent) to the Lao People's Democratic Republic for a technical assistance capacity building in the hydropower and mining sectors project*. Retrieved from http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2009/12/24/000334955_20091224013007/Rendered/PDF/509180PAD0P109101Official0Use0Only1.pdf
- World Bank (2010a). *Lao PDR development report 2010. Natural resource management for sustainable development. An Environmental perspective on hydropower and mining development in the Lao PDR*. Background paper. Retrieved from http://siteresources.worldbank.org/LAOPRDEXTN/Resources/293683-1301084874098/LDR2010_Social_Impact_Mitigation.pdf
- World Bank (2010b). *Lao PDR Development Report 2010. Natural Resource Management for Sustainable Development: Hydropower and Mining*. Report No. 59005-LA. Washington: World Bank. Retrieved from http://siteresources.worldbank.org/LAOPRDEXTN/Resources/293683-1301084874098/LDR2010_Full_Report.pdf
- World Bank (2010c). The socio-geography of mining and hydro in Lao PDR. Analysis combining GIS information with socioeconomic data. Technical Note – Draft. Washington: The World Bank.
- World Bank (2011). *World development indicators*. Retrieved from <http://data.worldbank.org/country/lao-pdr>
- World Bank, (2012). *Country partnership strategy for Lao Peoples Democratic Republic for the period FY12-FY16*. Report No. 66692-LA. Retrieved from http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2012/02/16/000333037_20120216000625/Rendered/PDF/666920CAS0P1200Official0use0only090.pdf

- World Commission on Dams (WCD) (2000). *Dams and development, a new framework for decision-making*. London: Earthscan Publications Ltd & VA: Sterling.
- World Water Council (2000). *World water vision: making water everybody's business*. London: Earthscan Publications Ltd. Retrieved from <http://www.worldwatercouncil.org/fileadmin/wwc/Library/WWVision/TableOfContents.pdf>
- WRCCS (2005). Strategic planning for integrated water resources management in the Lao People's Democratic Republic. Lao People's Democratic Republic, Water Resources Coordination Committee Secretariat. In ESCAP, *Good Practices on Strategic Planning and Management of Water Resources in Asia and in the Pacific* (pp. 66–88). Water Resources Series, No. 85. New York: Economic and Social Commission for Asia and the Pacific.
- WREA (2008). *National Water Resources Profile*. Department of Water Resources Water Resources and Environment Administration. Prepared under the Nam Ngum River Basin Development Sector Project, supported by the Asian Development Bank (Loan 1933-LAO) and Agence Française de Développement (Grant CLA 1048 01H).
- WREA (2010a). *National water resources policy (NWRP)*. Water Resources and Environment Authority, Lao People's Democratic Republic.
- WREA (2010b). *Draft national water resources strategy and action plan for the years 2011 to 2015*. Water Resources and Environment Authority, Lao People's Democratic Republic.
- WREA, Ministry of Planning and Investment & UNEP (2008). *Strategic Framework for the National Sustainable Development Strategy for Lao PDR*. Retrieved from <http://chm.aseanbiodiversity.org/laopdr/Related%20Document/Lao%20NSDS%20report%20UNEP%28ENGLISH%29.pdf>
- WSSD (2002). *Plan of Implementation of the World Summit on Sustainable Development*. The World Summit on Sustainable Development (WSSD), Johannesburg, South Africa.
- WTO (2012). *Accession Lao People's Democratic Republic*. World Trade Organisation. Retrieved from http://www.wto.org/english/thewto_e/acc_e/a1_laos_e.htm
- Xie, M. (2006, October). Integrated Water Resources Management (IWRM) – introduction to principles and practices. Paper presented at *the Africa Regional Workshop on IWRM*, Nairobi. Retrieved from http://iwlearn.net/abt_iwlearn/events/iwrmoct2006/Mei%20Xie%20IWRM%20Introduction.doc/view
- Yin, R. K. (1991). *Case study research, design and methods*. Newbury Park: Sage Publications.

Yin, R.K. (1981). The Case study crisis: some answers. *Administrative Science Quarterly*, 26(1), 58–65. <http://links.jstor.org/sici?sici=0001-8392%28198103%2926%3A1%3C58%3ATCSCSA%3E2.0.CO%3B2-H>

Yoshida, T. (2008, July). Key topics for Integrated Water Resources Management (IWRM). *NARBO 5th IWRM Training Seminar*, Hoi An, Vietnam.

Appended Publications

DOI: 10.1108/14468951111165377

Challenges in developing sustainable hydropower in Lao PDR

Sari Jusi
Researcher
Finland Future Research Centre, University of Turku
Pinninkatu 47, 33100 Tampere, Finland
sari.jusi@tse.fi
Tel: +358 50 588 0251

Abstract

Whereas substantial improvements in policies, legal requirements and assessment guidelines have occurred, hydropower planning and development still need improvement in Lao People's Democratic Republic. Since the development of hydropower has been rapid and will be in the near future it must be developed carefully in the context of broader development goals, including responsible institutional development, environmental management, social development and poverty alleviation along with integrated water and energy management. The purpose of the article is to analyse social and environmental sustainability considerations developed in Lao PDR and to identify problems and challenges related to sustainable hydropower planning and development.

1 Introduction

The path of Lao People's Democratic Republic (Lao PDR) to development has been firmly rooted in developing its abundant natural resources, including water, minerals, forests, wetlands and biodiversity. Although a relatively small percentage of 2.8 of the national water resource are developed for storage or abstraction, water is the fundamental resource for hydropower generation which has been identified as the major national development opportunity (WREA, 2008, 47, 57). The country has a theoretical vast hydroelectric potential of about 26,500 MW of which about 18,000 MW is technically exploitable (EPD, 2009). The national objectives of the hydropower development are to expand an affordable, reliable and sustainable

This article is © Emerald Group Publishing and permission has been granted for this version to appear here tampub.uta.fi. Emerald does not grant permission for this article to be further copied/distributed or hosted elsewhere without the express permission from Emerald Group Publishing Limited.

electricity supply, to promote economic and social development and to overcome country's comparative disadvantages in attracting industry and investment (WRCCS, 2008, 8–9). The goal of the Government of Lao PDR is to expand the generation, transmission, distribution and off-grid development to increase the domestic electrification ratio for the country to a target of above 90 per cent by 2020 (EPD, 2009; Lao PDR, 2004, 103).

The Government of Lao PDR has nine dams under construction, and nineteen dams in advanced planning. The Government has to date signed Memorandum of Understandings or is undertaking research studies on a total of more than seventy hydropower projects. Of these fifteen are either operational or under construction (EPD, 2009). The construction of a major power plant of the Nam Theun 2 Hydropower Project has added another 1,070 MW capacity in 2010. On average 65 to 80 per cent of the annually produced energy is exported (World Bank, 2005, 29).

The amount of power imported is expected to grow as a result of the rapidly increasing demand and the constraints on power generation (Messerli et al., 2008, 124; MRC, 2009, 3). Currently, domestic energy consumption is growing at 8 to 10 per cent annually (EPD, 2009). Until the year 2020, the electricity demand forecast is 7,770.7 GWh (average growth rate is 13 per cent per year) and peak load is 1,486.8 MW (average growth rate is 11 per cent per year) according to the Draft Power Development Plan (2007–16) prepared by Electricité du Laos (EDL, 2008, 26–27). The energy demands of the Mekong Region and of its neighbors, particularly China, are soaring, and there are substantial opportunities for trading of power between the countries in the Region (MRC, 2007, 29). Due to its energy surplus and geographical location at the hub of the Greater Mekong Sub-region (GMS), the Lao PDR is strategically positioned to play a significant role in promoting regional power trade (Lao PDR, 2004, 3; MRC, 2007, 29; WREA, 2008, 1).

Currently the Lower Mekong Basin countries are net importers of fossil fuels, therefore hydropower projects would bring significant macro-economic benefits by reducing dependency on energy imports from outside the region. The Lao Government is committed to reducing dependence on fuel wood and imported fossil fuels by promoting, where practicable, renewable forms of electrical energy, especially the hydropower projects (WREA, 2008, 8). Hydropower generation is an opportunity for the country to contribute to international efforts to reduce greenhouse emissions. Although Lao PDR is a minor contributor to climate change, climate change at global and regional levels may have significant impact on the country and energy sector including hydropower. The country has prepared a National Adaptation Programme of Action (NAPA) for Climate Change in 2009 and

has established its National Climate Change Office and technical working groups to manage its climate change activities (ADB, 2009b, 48). Measures to combat climate change may be expected to include a greater dependence on hydropower as a renewable source of electricity and raises a major sustainability issue of global importance (Bird et al., 2008, 5; see more for example ADB, 2009a; 2009b; 2007; Callander, 2007; Harrison and Whittington, 2001; WCD, 2000).

The future development prospects of Lao PDR depend to a significant degree on the electricity sector being economically efficient and acting as a net contributor to the nation's wealth, as well as effectively providing service to meet the growing electricity needs of the nation's citizens. Hydropower development needs to be seen within the context of national policies with regard to overall water resources development as well related land resources development (like mining, forestry, etc.) as these will be important in relation to sustainability of projects.

The reason for focusing on Lao PDR in this article is that hydropower is considered by the government of Lao PDR to represent the most promising prospect for development of its water resources and national economy. While not large by international standards, the projected electricity production is enormous in comparison to the Lao economy size. For electricity, the volume is about average, but projected into 2014 in percent of GDP, it is twice as much as any other country by the World Bank's World Development Indicators (2011). These forecasts are subject to a lot of uncertainty since most of the hydropower dams are expected to come on stream in the future. The big question is how to turn hydropower potential and the development of it to social and economic development in a socially, environmentally and economically sustainable way in a resource-rich country of Lao PDR.

There is a lot of research that has shown evidence of a 'curse of natural resources' which means that countries with great natural resource wealth tend nevertheless to grow more slowly than resource-poor countries (Sachs and Warner, 2001, 827). Experience from resource-rich developed and developing countries across the world indicates that the quality of existing institutions and governance is key in ensuring that resource wealth turns into a blessing for economic development, instead of a curse (see e.g. Mehlum, Moene and Torvik, 2001, 1; World Bank, 2010a, 15).

The likelihood that poor institutions and governance lie at the root of the so called natural resource curse is an important consideration also for Lao PDR as the country has a significant dependence on natural resources and is rapidly increasing exploitation of hydropower over the medium to long term. Country's existing governance institutions and legal and institutional frameworks that aim to govern the exploitation of natural resources and environmental protection have

undergone promising improvements over the last years. But despite the existence of legislative and other administrative frameworks, weaknesses remain in regulatory and enforcement capacity (European Union, 2006, 13). There are still some unclear institutional mandates, and the dissemination of laws is not wide reaching enough, coordination between multiple agencies involved in natural resources management is lacking and limited human capacity prevents effectiveness of institutional environment. These deficiencies limit country's ability to manage its own natural resources strategically and to ensure that the rapid development of natural resources based projects including hydropower projects occurs in a balanced, and socially and environmentally acceptable way.

The purpose of the article is to analyse social and environmental sustainability considerations developed in Lao PDR. The article discusses the existing environment associated with hydropower development and planning and the challenges related to that sector in Lao PDR. The paper aims to shed light on problems and constraints in the hydropower sector and suggest some opportunities to meet the emerging challenges, the implementation of policies and institutional strengthening processes that will lead to improved and sustainable development of hydropower in the country. The paper can act as a discussion awakener, help and give some guidance to integrate sustainable development considerations into hydropower development and planning. It aims to provide policy-makers with the kind of information they need to better understand the environmental, social and economical implications of hydropower developments.

2 Institutional Framework for Developing Sustainable Hydropower in Lao PDR

There is a world-wide literature¹ on inherent risks in development and operation of hydropower which cross the range of financial, engineering, geological, and market concerns with particular attention to environmental protection, social inclusion, resettlement and sharing of the benefits of development across all stakeholders. To promote greater consideration of environmental, social and economic aspects in the sustainability assessment of hydro projects and the management and operation of existing power schemes, international organizations like World Commission on

¹ For more information on impacts of hydropower, see for example Callander, 2007; Greacen and Palettu, 2007; Ministry of Planning and Investment, et al., 2009; WCD, 2000; World Bank, 2009b; WREA, 2008.

Dams (WCD, 2000) and the International Hydropower Association (IHA, 2004) among the international financiers (World Bank, 2009a) have produced guidelines. There is clear acceptance of the precautionary² and eco-efficiency³ approaches and the core values of sustainability, efficiency, equity, participatory decision making, and accountability. The key question to consider is how to provide energy in a way that is consistent with the goals and principles of sustainable development, ensuring a better quality of life for all people, including future generations (McCully and Wong, 2004, 1).

It is important to ensure that hydropower potential in Lao PDR will be sustainably developed, which implies achieving minimal adverse social and environmental impacts, and at the same time helping the country's socio-economic development being economically sustainable. As rural Laos remains an essentially agrarian society, and the livelihoods of its people are underpinned by the presence of the healthy and diverse ecosystems that provide them with sustenance, the issue of sustainability is very important (ADB, 2000, 44). High dependence of the households on natural resources for income and food increases rural people's vulnerability to hydropower related social and environmental risks. Especially the impact of dams on fishery is an important issue to be considered⁴. A big concern is whether the Lao Government will ensure that there is a net benefit to people, including those directly affected, from the building of dams. The remaining chapter discusses environmental and social viewpoints and elements of hydropower in Lao PDR.

Environmental and social safeguards which encourage the sustainable use and protection of natural resources through minimization of environmental impacts from development projects are put in place in Lao PDR. The Government of Laos has already developed quite a comprehensive body of domestic legislation; the Law on Water and Water Resources (LWWR) (1996), Forestry Law (1996), Land Law (1997), Agriculture Law (1998), and Environmental Protection Law (1999) to deal with sustainability and environmental conservation issues in its policies and regulations to ensure sustainable development (World Bank, 2005, 46-47). The Law on Water and Water Resources determines principles, rules and measures relative to the administration, exploitation, use and development of water and water resources, in order to preserve their sustainability, ensuring their volume and quality so as

² For more information on precautionary approach, see European Union, 2000; Harremoës et al., 2001; WCD, 2000.

³ For more information on eco-efficiency approach, see Lehni, 2000; WBCSD, 2000; WSSD, 2002.

⁴ Birch, A. IWRM Specialist/Team Leader on Nam Ngum Development Sector Project. Personal communication. Vientiane, Lao PDR, 13 March 2009.

to meet the people's living requirements (WREA, 2008, 18). The Water Resources Law will be revised to provide Water Resources and Environment Administration (WREA) with clear legal backing and authority to manage national and river basin-level water resources.

According to the Environmental Protection Law of 1999, and Environmental Assessment Regulations 1770 of 2000, all large hydropower projects must produce a full Environmental Impact Assessment (EIA) report and Environmental Management Plan (EMP) (STEPA, 2006, 12). According to Environmental Protection Law (1999, Article 36) Water Resources and Environment Administration (WREA) is responsible for evaluating Social-Environmental Impact Assessment (SEIA) and other environmental reports, and regulating agencies to curtail or modify activities that are having an adverse effect on the environment. The Environmental Protection Law also makes provisions for the need to consult with project-affected persons during the environmental assessment process. The Government has also developed a draft resettlement policy in 1997 (Article 1.2), which states that 'the population participates in the consultation, planning and design process of their new settlement and production areas'.

The Lao Environmental Impact Assessment process is largely congruent with international guidelines for conducting EIAs. However, there is some unclear division of responsibility among agencies, inadequate human and financial resources and inconsistency of regulations. In response to these deficiencies the Government has recently promulgated the binding approval of the Environmental and Social Impact Assessment and the related Compliance Certificate, as part of the concession acquisition process (World Bank, 2009b, 11). WREA is currently developing the processes and appropriate framework for awarding of licenses and concessions related to natural resources use (hydropower and mining)⁵.

The Electricity Law (1997) stipulates that investors in electricity production have the obligation to protect the environment, namely to assess the impact on natural environment, on the ecosystem, to limit the impact on society and wildlife habitat (WREA, 2008, 22). Moreover, enacted Lao Technical Electric Standard provides the necessary guidance to maximize dam safety during construction and operation (EPD, 2008).

A lot has been learnt from previous project experiences and issues like environmental impact and resettlement have been thought over and revised in Nam Theun 2 Project preparation (ADB, 2001; World Bank, 2010b). The Nam

⁵ Pholsena, K. Minister to the Prime Minister's Office, WREA. Personal communication. Vientiane, Lao PDR, 26 August 2010.

Theun 2 Project plays an important role in the broader development of the country by building capacity to manage natural resources and develop infrastructure; and by improving transparency and the effectiveness of public expenditure management systems (Khamvalvongsa, n.d.; FREPLA2020; 2009a; 2009b). It is recognized by the Government of Lao PDR to be as an essential part of the country's development framework to reduce poverty. Currently it is still the only existing and planned hydropower project in which revenue management commitments have been proposed to help direct Government earnings towards poverty reduction expenditures (Lawrence, 2008, 15).

One important policy to arise from the project has been the GOL's National Policy: Environmental and Social Sustainability of the Hydropower Sector in Lao PDR. The aim of this policy is to help ensure that the principles of social and ecological sustainability are integrated into all large hydropower developments to ensure sustainability and equitable benefit distribution of hydropower developments, as well as to replicate relevant lessons from the Nam Theun 2 Project in other investments (STEA, 2006, 12; World Bank, 2009b, 3). The policy promotes an integrated approach to river basin management with multiple projects on a single river. Cumulative impacts are to be recognized and measures required for their mitigation. Some of the main elements of the policy are a broad definition of project affected people and their right to sustainable development options, free prior and informed consultation, disclosure of project consultation reports, compliance with oversight from third party agencies, and project revenues to cover the cost of environmental and social safeguards through the Environmental Protection Fund (EPF) established in June 2005 (MRC, 2009, 10; STEA, 2006, 12–16).

The Environmental Protection Law stipulates an Environmental Protection Fund (2011), which has specialized funding 'windows' for the collection, management and distribution of funds from large scale water developers such as hydropower. Hydropower projects are supposed to contribute a percentage of revenues to the Environment Protection Fund, which would then distribute the funding to institutional capacity building, environmental and biodiversity conservation programs. Revenue from Nam Theun 2 will flow to the EPF (World Bank, 2009b, 11). However, the fund has not been functioning properly⁶, but the mechanism could potentially serve as a model for direct benefit sharing with affected communities (Lawrence, 2008, 87). The establishment of the first Watershed Management Protection Authority in Lao PDR is also an accomplishment of the Nam Theun 2.

⁶ Visounnarath, V. Environmental Office Manager. Electricite du Laos, Technical Department, Environmental Office. Personal communication. Vientiane, Lao PDR, 2 June 2009.

This Authority is responsible for the management and protection of the watershed of the Nam Theun 2 above the reservoir formed by the Nam Theun 2 hydro-electric dam (WMPA, 2010).

On the other hand, some international NGOs (like International Rivers⁷, Probe International⁸, World Wildlife Fund⁹) have criticized the project is not leading to improvements in the design and management of Lao dam projects so that impacts on communities and the environment are addressed. The non-existence of guarantee mechanism to protect Lao people from the risks of private investment, or in the event that the benefits promised by the project do not materialize has arisen a lot of criticism (Lawrence, 2008, 3, 16; Imhof and Lawrence, 2005, 2–7). There are also big doubts even at the high government ministerial level that the Nam Theun 2 project cannot be replicated. The Head of Department of Electricity¹⁰ stated:

‘Yes, they are saying that Nam Theun 2 is a very good project. But to use it as a standard, it’s not possible. We can use it as a good example, a good guide line, but not as a standard. All the developers say that it is not possible to use Nam Theun 2 as a standard’.

The households that will be affected by future hydro development are among the poorest households in Lao PDR locating in remote and marginal areas with lack access to health and education (World Bank, 2010c, 8). Because the benefits and negative impacts are unevenly distributed, proper benefit sharing mechanisms and mitigation measures become imperative for sustainability and stability of development in the hydropower sector. Issues like fisheries and livelihoods of affected communities are important to consider and study carefully developing and planning hydropower as were identified also in the Mekong River Commission’s Strategic Environmental Assessment of the proposed mainstream hydropower schemes (ICEM, 2010, 129–130). The issue of food security is also becoming more important as the country emphasize natural resources development including hydropower at the expense of the environment and livelihoods while not properly considering of global trends for food and energy (Lawrence, 2008, 19; Fullbrook, 2009).

⁷ <http://www.internationalrivers.org/>

⁸ <http://www.probeinternational.org/home>

⁹ <http://wwf.panda.org/>

¹⁰ Viravong, V. 2010. Head of Department, Department of Electricity, Ministry of Energy and Mines. Personal communication. Vientiane 23 August 2010.

The Mekong River Commission (MRC) has commissioned a Strategic Environmental Assessment¹¹ (SEA) of all the proposed mainstream projects including the effects of dams built and being planned in China upstream (ICEM, 2010). The SEA seeks to identify the potential opportunities and risks, as well as contribution of these proposed projects to regional development, by assessing alternative mainstream Mekong hydropower development strategies (Mekong River Commission Secretariat, 2010). Having tentatively weighed the potential risks and economic benefits of a Mekong mainstream hydropower industry, the recommendation of the strategic environmental assessment (SEA) is to defer any dams for a decade. The World Bank has already confirmed it will not finance and has no plans to invest in hydro projects on the mainstream of the Mekong (World Bank, 2010d).

Ten of the twelve main stream Mekong dams are planned for the Lao PDR. Experts have repeatedly warned that any Lower Mekong mainstream dam, like planned Xayaboury in Lao PDR near the Thailand border will carry important risks to food security, given its impact on fisheries and agriculture. Experts and many NGOs¹² worry that these problems are the early symptoms of a coming crisis – one spurred by unsustainable development and climate change. They have emphasized the need to employ modern and more sustainable energy options, to identify alternatives to the Xayaboury and other destructive projects, to conduct proper public hearings, and to preserve the Mekong to allow for the security and continuity of future generations.

While Lao PDR has adopted many measurements to protect environment, increase in supply to meet the future energy demand poses challenges for the environment and project affected people. One of the key concerns is the ability of the government to fully assess the impacts of proposed hydropower developments and to integrate multiple issues in natural resource management. Understanding how current and planned hydro projects overlap with other natural resources will help to plan developments and design mitigation strategies with the aim of preserving resources for current use and future generations (World Bank, 2010c, 2–3).

¹¹ The SEA is coordinated by the Initiative on Sustainable Hydropower, a cross-cutting MRC initiative that works together with other MRC programs.

¹² Thanh Nienh News. Mekong Thirst Hard to Quench, 17 October 2010; Thanh Nien News. Mekong Commission Accused of Ignoring Own Findings on Dam Impacts, 9 March 2010b; Bangkok Post, 2011, Thai Greens Step up Campaign against Laos' Xayaburi Dam. 17 February 2011, <http://www.bangkokpost.com/news/local/222007/thai-greens-step-up-campaign-against-laos-xayaburi-dam>

3 Problems and Challenges

To achieve its socio-economic objectives, Lao PDR needs manage its hydropower development to ensure environmental and social sustainability through implementing proper policies and institutions building. The sheer projected size of the Lao energy sector with respect to the economy and government's revenues, as well as the speed of growth will put pressure to develop institutions, policies, and fiscal framework to properly use natural resources in its development strategy. This Chapter discusses some of the main challenges and problems that hydropower sector is facing in Lao PDR.

3.1 Weak Institutional Capacity of Environmental and Social Management

While key legal institutions and frameworks are in place in the hydropower sector in Lao PDR, they tend to be constrained by low capacity and weak implementation. Shortage of human resources at key sector regulatory agencies including Water and Resources Environment Administration, Ministry of Energy and Mines and provinces have been a bottleneck for preparing environmental and social sustainability, and enforcing sound sector development planning, and managing and supervising the sector development to ensure cost-effectiveness and compliance with relevant government policies and decrees (World Bank, 2009b, 4–5). There is a need to conduct thorough capacity assessments and prepare capacity building plans and to ensure proper funding for these activities. Outreach activities and implementation of operational practices will be required. There is also a need to develop capacity for operation and maintenance after concession period ends.

Major gaps remain between the formulation and implementation of legal instruments, and between the establishment and enforcement of rules and regulations. Important issues to be raised are implementation and enforcement of the existing environmental regulations and building of enforcement and monitoring capacity related to the hydropower sector. Implementation capacity for environmental and social impact assessment procedures needs to be strengthened within Water Resources and Environment Administration and other relevant ministries. Especially capacity building to monitor the implementation of environmental management and mitigation processes is highly required as well as awareness building of all actors at all levels to protect the environment.

Environmental and social impact assessment still frequently fails to influence decision making, like for example the case of Theun-Hinboun dam shows (see more

ADB, 2000; Callander, 2007; Jusi, 2006; Lawrence, 2008; WCD, 2000). There is a need to improve environmental governance at the same pace as current trends in foreign direct investments in the hydropower sector by encouraging companies to commit to a high standard of socio-environmental performance and ensuring clear investment laws and coordination mechanisms related to environment impact assessments (Shaw et al., 2007). By the approval of the new Environmental and Social Impact Assessment (ESIA) Decree, ESIA procedures and process will become more clarified, including clearer roles and responsibilities of key agencies and project owners; the role of WREA as the third-party regulating agency at all stages of approval and monitoring will be stronger; and there will be clear requirement for social impact assessments, public involvement, and disclosure (World Bank, 2009b, 104).

Inadequate transparency and poor accountability compromise the ability to monitor the environment (Bestari et al., 2006, 8; Callander, 2007, 6). Institutional structures for oversight and monitoring include multiple government agencies, yet there are evidently major gaps in implementation, some due to unclear and/or overlapping institutional mandates. There is a need for stronger vertical and horizontal institutional coordination across the Government agencies and for building capacity to improve and enhance environmental and social monitoring activities of WREA¹³. Since WREA does not have the funding or staff to monitor dams during their construction or operation phases, many dam companies will be able to reduce their costs by violating Lao regulations and the commitments they made to affected communities (Lawrence, 2008, 3).

To develop financially-sound hydro projects that are socially and environmentally responsible and will improve the living standards of Lao people co-operation between the Government of Lao, developers, civil society, donors, and local communities will need to be strengthened. Furthermore, it is difficult for policymakers to keep pace with the scale of investment and economic growth in Lao PDR. A slower-paced development would allow developers the necessary time to learn more about economic aspects of hydropower development along with social and environmental issues.

¹³ Pholsena, K. Minister to the Prime Minister's Office, WREA. Personal communication. Vientiane, Lao PDR, 26 August 2010.

3.2 *Gaps in Public Participation*

Public hearings in hydropower development are an essential safeguard mechanism for a meaningful intervention by consumers and other vulnerable stakeholders in decisions that will ultimately become their lasting economic and social burden (Greacen and Palettu, 2007, 122; WCD, 2000, 176–177). By and large, there are many deficiencies and constraints related to public participation and involvement in Lao PDR. Critics are concerned with lack of public participation in Lao PDR and that corruption and lack of democracy in Mekong countries will be increased rather than decreased by revenue streams from large hydropower projects (Greacen and Palettu, 2007, 100).

Benefit-sharing and execution of the entire chain of participatory consultation have proven complicated to implement since management tools and capacities at the local level are limited¹⁴ (World Bank, 2009b, 109). There is also a lack of data and information related to public involvement and financial constraints. Local voices have been limited in sector and national planning, where decisions about whether to develop a hydropower project are made in processes structured around inter-agency meetings. Decisions on the project design parameters and project components are largely taken within the domain of the responsible ministries and utilities with limited public discussion. (MRC, 2009, 19; STEA, n.d). Lack of public access to information on environmental and social impacts as well as mitigation plans and measures can worsen the negative impacts. Dialogue with local authorities and people affected should be initiated so that all implications are well understood (MRC, 2009, 72).

3.3 *Lack of Data Management*

Up-to-date, accurate and accessible database of hydropower projects is highly needed to help to estimate and mitigate impacts. Currently there is no national water resource information management system and water related data is largely fragmented and scattered among agencies in Lao PDR. Most information held by government agencies is still on paper, rather than in electronic format (GOL and UNDP, 2004, 10). There is also lack of limited coordination between private sector hydropower developers in same basin or with mining operations (Bird et al., 2009, 48).

¹⁴ Komany, S. Head of Water Policy and Legislation Division, Department of Water Resources. Personal communication. Vientiane, Lao PDR, 20 August 2010.

The current re-structuring of the Lao Department of Hydrology and Meteorology (DHM) and establishing it under the Water and Resources and Environment Administration will facilitate the incorporation of new data from developers in the current DHM database (MRC, 2009, 71). To ensure equitable and sustainable use of Mekong water resources, dialogue also with neighboring countries, especially China is important because it regulates Mekong flows and is also a potential power purchaser and developer (MRC, 2009, 67). Information flow between riparian countries is an important element of co-operation, especially hydropower database and environmental baseline information for hydropower planning.

3.4 Lack of Sustainable Financing Mechanisms

Currently, energy demand growth has been rapid and the availability of concessional funds and grants of multilateral development banks is not keeping pace with the increasing capital requirements of the sector. Restructuring and reform of the energy and water sector in many countries including Lao PDR has changed the role of government in decision-making and planning, with private investors and corporations taking both financing and ownership roles in these projects (WCD, 2000, 172). The largest of the new investors in Laos are state-owned Chinese banks, like the China Exim Bank along with financiers from Thailand, Vietnam, Russia and Malaysia. Finance from these sources appears to be abundant and the financing model is effective in accessing loans, but it is new and the associated procurement practices are weak (Maunsell Limited and Lahmeyer GmbH, 2004, 22). The Government of Lao mobilizes private sector participation by using Build-Operate-Transfer (BOT) modalities (WREA, 2008, 8).

The existing problems and weaknesses in private financing models (planning and procurement) can impact negatively to economic sustainability and effectiveness in Lao PDR. Promotion of Independent Power Producer (IPP) projects in Lao PDR begins with an unsolicited proposal from a sponsor and, from this, a Memorandum of Understanding is drawn up and a concession ultimately negotiated. Concessions are awarded in the absence of competition after the sponsor has completed technical and environmental studies of the proposed project. (Maunsell Limited and Lahmeyer GmbH, 2004, 22).

The involvement of the private sector on a significant scale introduces problems for power planners in managing the uncertainty of Independent Power Producer (IPP) commercial operation date (CODs) and a means of countering this risk must be found for the private sector's role in domestic generation development to be

dependable and constructive (Maunsell Limited and Lahmeyer GmbH, 2004, 22, 98). Delays in CODs lead to increases in interest accumulated on funds borrowed for construction activities and to delays in revenues accruing to the owner from the completed project (WCD, 2000, 41). Moreover, NGOs and international financing institutions alike have raised concerns that Chinese hydropower financiers and developers generally lack policies on environmental and social issues and do not necessarily adhere to internationally accepted standards and guidelines (Middleton, 2008; Osborne, 2004, 40–44; WCD, 2000, 188).

Overall, the failure of project delivery (IPP) can be seen as one of problems related to the practice of awarding mandates for Independent Power Producer projects as an unsolicited, negotiated transaction based on a Build-Operate-Transfer modality. Problems related to this approach include the lack of transparency and competition, the failure to filter out projects inconsistent with IPP program objectives, insufficient government control of project development, lack of Government's capacity to assess competing development proposals and evaluate associated opportunity costs, a high degree of uncertainty on project outcomes, and unnecessary time commitments for all parties in Lao PDR (Maunsell Limited and Lahmeyer GmbH, 2004, 22, 98; World Bank, 2009b, 3–4; Worley International Ltd. and Lahmeyer International, 2000, 122–123).

Developing new financial models require strong independent regulation and integrated resource planning (Greacen and Palettu, 2007, 121). There is a need to establish a regulator to set domestic retail tariffs and negotiate wholesale export tariffs. Currently import tariffs are higher than export tariffs. The establishment of a regulator would mean tariffs could be pre-set before bidding power generation concessions and bidding would therefore be on some other criterion, perhaps the highest royalty payments. Also, a creation of a centralized Lao power purchasing agency or cooperative that could competitively bid power concessions within Lao PDR and could sell the off-take from some or all Lao projects to domestic and/or foreign power purchasers is needed. (Maunsell Limited and Lahmeyer GmbH, 2004, 24).

For Lao PDR it is important to develop a policy that defines the standard method for determining the fiscal benefits from hydropower projects to clearly state the Government's expectations and to optimize economic benefits of hydropower development to the country. The Government needs to ensure that the less direct and longer-term benefits of hydropower projects are not overlooked in the planning process or penalized by short-term financing or tax regime requirements. With new developments, capital and operating costs should be taken into account over the

lifetime of a project with a life-cycle assessment of project alternatives forming an integral component of assessment processes. Direct and indirect costs and benefits should be identified, and where possible quantified in monetary terms. (Scanlon et al., 2004).

3.5 *Too High Power Demand Projections*

Lao PDR's economy is a great deal heavily dependent on its regional neighbors. When it comes to future plans for hydropower projects in the region and in Lao PDR, they are justified in part by uncertain projections of high demand for electricity in Thailand, Vietnam and China (Greacen and Palettu, 2007, 111, 123). This has implicated overstating export prospects in Lao PDR. Moreover, the global economic downturn has sharply reduced demand in the country's export markets. Demand forecasts are also likely to be too high due to overstated mining sector growth forecasts. It has also been criticized that the future power targets of the Electricite du Laos' Power Development Plan (2007–16) are not achievable due to lack of availability of funds for capital works and, secondly, capacity constraints within the Lao power transmission and distribution system (Maunsell Limited and Lahmeyer GmbH, 2004, 30). Overall, hydropower should be seen more as a facilitator to other sectors (infrastructure, services, agriculture) development and not only as a bringer of export revenues. Balancing import and export of electricity is important as the domestic demand needs to be also ensured for growing national consumption¹⁵.

Overstating future demand has led to a perceived need for a large incremental response to meet rapidly growing needs. In many circumstances this has militated against a gradual approach of adopting smaller, non-structural options and has pushed decision-makers into adopting large-scale dam projects because they seem to be the only adequate response to the large gap between existing supply and forecast demand. Small-scale hydropower has not been developed properly or widely enough, especially in remote areas without access to the national power grid. Of principal concern is that it is frequently the agencies (like in Thailand) that are responsible for building supply infrastructure that are also charged with undertaking demand forecasts, leading to a potential conflict of interest. (Foran and Greacen, 2007, 3–5; Greacen and Palettu, 2007, 111; WCD, 2000, 179).

Pace of integration of the Greater Mekong Sub-region (GMS) and ASEAN power systems and, in particular, the timing of transmission interconnections are issues

¹⁵ Rasasombath, S. Vice Minister of Ministry of Energy and Mines. Personal communication Vientiane, 25 October, 2010.

that raise uncertainty in power sector investment planning as well (Maunsell Limited and Lahmeyer GmbH, 2004, 24). According to Head of Department of Electricity Mr. Viravong (2010) the regional power pool will not actualize in the very near future because of Governments disinterest to the GMS power pool due to the good feasibility of the Build-Operate-Transfer mechanism.

The uncertainty of these large demand projections of hydropower projects and associated expected revenues can negatively impact the Lao economy. As the government follows the export led growth model of economic development, the dilemma facing the government is that it sees no other industry, resource based or otherwise, in the short to medium term apart from hydropower that will generate what it believes to be potentially large export revenues. This so called 'Dutch disease' through so called spending effect, or high spending induced by significant capital and/or revenue inflows, can lead to inflation and real exchange rate appreciation resulting in loss of competitiveness, slow down in industrialization, or even a shrinking of the manufacturing or other tradable non-resource sectors (Brahmbatt, Canuto and Vostroknutova, 2010).

4 Looking Ahead

The country's abundant water resources and mountainous terrain have allowed the Government of Lao to set up a master plan to develop hydropower and export large quantities of hydroelectric energy. Quick growth and steep forecasted size of the energy sector with respect to the economy and government's revenues will put a lot of pressure to develop institutional environment, policies and fiscal framework to properly use natural resources in Lao PDR's development strategy. When planning and developing hydropower sector investment, ongoing development of the legal, institutional and regulatory environment and strengthening of the institutional capacity and improvements in the commercial position of Electricite du Laos are issues to be considered in Lao PDR (FREPLA2020, 2009a).

Major problems of Lao hydropower sector relate to capacity and institutional environment, such as insufficient quality of environmental and social assessments, ineffective regulatory framework, a lack of transparency, and the failure to conduct comprehensive consultations with all stakeholders. The opportunities and challenges of hydropower development are complex, and ultimately dependent on the resources, skills, and will to invest responsibly, with due regard to economic, environmental and social aspects of sustainable development. The governance gap remains a crucial

challenge that will increase over time if the government does not take strategic and continued action to enhance governance and institutional capacity. To avoid this natural resource curse in Lao PDR adequate government policies and proper policy implementation along with institutions building and proper sector governance are required.

There is a need to better assess strategically the hydropower development options for Lao PDR and the use of hydropower development generated revenues to poverty reduction activities. The collective benefits to the country can be maximized if individual hydropower investments are assessed as part of a river basin approach (to understand cumulative hydrological, environmental and social impacts, as well as to increase the economic potential for any given level of impacts) as well as the energy sector development strategy (World Bank, 2010c, 11). Also there is a need for integrated planning approach which takes into account mining sector development as these sectors are closely interwoven mining sector being dependent on energy sector for its production¹⁶.

Mechanisms for accountability and democratic control and need for participatory approaches to hydropower planning and management need to be well recognized and strengthened in Lao PDR. Processes and activities related to risk assessment and management need to be established and developed in the energy sector. Currently the risk management lies on private sectors/investors shoulders and as for the risk management the Government has been relying on the Multilateral Development Banks¹⁷. There is need to conduct research related to this issue and to designate and define clear responsibilities of the risk assessment and management activities to the hydropower sector organizations.

Lao PDR can definitely use its large hydropower advantages but should also learn a lot from other countries in relation to hydropower and from past mistakes of the mechanisms to ensure that affected communities receive a share of the benefits from hydropower projects and best social and environmental programs are put in place in order to effectively manage impacts. The country can draw on the lessons that are emerging from the Nam Theun 2 project which can generally provide a best practice example in environmental management of hydropower projects.

Even though, the Mekong River Commission (MRC) has also its own internal challenges, the role of it as an institution that can liaise and coordinate between

¹⁶ Viravong, V. Head of Department, Department of Electricity, Ministry of Energy and Mines. Personal communication. Vientiane 23 August 2010.

¹⁷ Rasasombath, S. Vice Minister of Ministry of Energy and Mines. Personal communication Vientiane, 25 October, 2010.

the varying interests of all the countries is important in sustainable hydropower development in the Mekong basin. By strengthening of the role of the MRC it can more vigorously exercise its role of helping Mekong countries cooperate and promote sustainable development of its water as it takes its Initiative on Sustainable Hydropower¹⁸ along with upcoming Strategic Environmental Assessment.

References

- Asian Development Bank (2000) *Environments in Transition – Cambodia, Lao PDR, Thailand, Viet Nam*. Manila: Asian Development Bank.
- Asian Development Bank (2001) 'Reality Check of the WCD Guidelines. A Case Study for the Nam Theun 2 Hydro-electric Project in Lao PDR'. Workshop to discuss the World Commission on Dams Report Dams and Development, Manila (19–20 February).
- Asian Development Bank (2007) *Asian Water Development Outlook 2007*. Manila and Tokyo: Asian Development Bank and Asia-Pacific Water Forum.
- Asian Development Bank (2009a) *The Economics of Climate Change in Southeast Asia: A Regional Review*. Manila: Asian Development Bank.
- Asian Development Bank (2009b) *Understanding and Responding to Climate Change in Developing Asia*. Manila: Asian Development Bank.
- Bestari, N., C. Mongcopa, J. Samson and K. Ward (2006) *Lao PDR: Governance Issues in Agriculture and Natural Resources. A Case Study from the 2005 Sector Assistance Program Evaluation for the Agriculture and Natural Resources Sector in the Lao People's Democratic Republic*. Manila: Asian Development Bank.
- Bird, J., M. Goichot, I. Makin, K. Moua and P. Perera (2008) 'Environmental Consideration for Sustainable Hydropower Development in the Mekong Region – A Joint ADB, MRC and WWF Initiative'. Paper presented at Yangtze Symposium, Yichang (29 October).
- Bird, J., W. Arriens and D. Custodio (2009) *Water Rights and Water Allocation. Issues and Challenges for Asia*. Manila: Asian Development Bank.
- Brahmbhatt, M., O. Canuto and E. Vostroknutova (2010). 'Dealing with Dutch disease', Vox policy portal, the Centre for Economic Policy Research. www.voxeu.org/index.php?q=node/5213.
- Callander, T. (2007) 'Environmental Impacts of Trade Liberalization in the Hydropower, Mining and Construction Materials Sectors, Lao PDR'. Environment Assessment Project (RTEA) – Background research paper. International Institute for Sustainable Development (IISD).
- EDL (Electricité du Laos), (2008) *Draft Power Development Plan (2007–16)*. Vientiane, Lao PDR: Electricité du Laos, System Planning Office, Technical Development Committee, Ministry of Energy and Mines.
- EPD (Department of Energy Promotion and Development) (2008) 'Powering Progress. Hydropower News'. www.poweringprogress.org/index.php?option=com_content&view=article&id=196:22-february-2008-investors-urged-to-comply-with-lao-hydropower-standards&catid=86:hydropower-in-the-media&Itemid=50.

¹⁸ www.mrcmekong.org/ISH/ISH.htm

- EPD (Department of Energy Promotion and Development) (2011) 'Powering Progress'. www.poweringprogress.org/.
- Environment Protection Fund (2011). www.laoepf.org.la/.
- European Union (2000) 'Water Framework Directive'. http://europa.eu/legislation_summaries/agriculture/environment/128002b_en.htm.
- European Union (2006) 'EU 2007–2013, Lao PDR – EU Community Strategy Paper for the Period 2007–2013'. http://www.eeas.europa.eu/laos/csp/07_13_en.pdf.
- Foran, T. and C. Greacen (2007) 'Towards More Sustainable Energy Futures for the Mekong Region: Policy options for Development Donors'. Palang Thai working paper. www.palangthai.org/docs/TowardsMoreSustainableEnergyFuturesforMekong.pdf.
- Fullbrook, D (2009) 'Development in Lao PDR: The Food Security Paradox'. SDC Working Paper Series. www.laofab.org/document/view/1026.
- Future Resource and Economy Policies in Lao PDR till 2020 Project (FREPLA2020) (2009a). 'Summary of First Expert Workshop'. Unpublished report of FREPLA2020 Project workshop, Vientiane, Lao PDR (3 June).
- Future Resource and Economy Policies in Lao PDR till 2020 Project (FREPLA2020) (2009b). 'Summary of Expert Workshop II'. Unpublished report of FREPLA2020 Project workshop, Luang Prabang, Lao PDR (29–30 October).
- GOL (Government of Lao People's Democratic Republic) and UNDP (United Nations Development Programme) (2004) '*Coordinating the Implementation of Multilateral Environmental Agreements in Lao PDR*'. www.undplao.org/whatwedo/Projectdocs/MEA%20Progr%20Final%2004%20Prodoc.pdf.
- Greacen, C. and A. Palettu (2007) 'Electricity Sector Planning and Hydropower' in L. Lebel, J. Dore, R. Daniel and Y.S. Koma (eds) *Democratizing Water Governance in the Mekong Region*, pp. 93–126. Bangkok: Mekong Press.
- Harremoës, P., D. Gee, M. MacGarvin, A. Stirling, J. Keys, B. Wynne and S. Guedes Vaz (2001) *Late Lessons from Early Warnings: The Precautionary Principle 1896–2000*. Environmental issue report No 22. Luxembourg: European Environment Agency.
- Harrison, G. and H. Whittington (2001) 'Impact of Climatic Change on Hydropower Investment in B. Hanningsvåg, G. Midttomme, K. Repp, K. Vaskinn and T. Westernen (eds) *Hydropower in the New Millenium*, pp. 257–260. Lisse: Swets & Zweitinger.
- ICEM (International Center for Environmental Management) (2010) *MRC Strategic Environmental Assessment (SEA) of Hydropower on the Mekong Mainstream*. Hanoi: ICEM.
- IHA (International Hydropower Association) (2004) '*Sustainability Guidelines*'. www.hydropower.org/downloads/IHA%20Sustainability%20Guidelines_Feb04.pdf.
- Imhof, A. and S. Lawrence (2005) '*An Analysis of Nam Theun 2 Compliance with World Commission on Dams Strategic Priorities. Executive Summary*'. www.edf.org/documents/4400_NT2ExecSummary.pdf.
- Jusi, S. (2006) 'Asian Development Bank and the Case Study of Theun-Hinboun Hydropower Project in Lao PDR', *Water Policy*, 8(5): 371–394.
- Khamvalvongsa, F. n.d. '*Sustainable Development in Asian Countries, "A Case of Lao PDR"*'. www.ide.go.jp/Japanese/Ideas/pdf/followup_14/07.pdf.
- Lao PDR (Lao People's Democratic Republic) (2004) *National Growth and Poverty Eradication Strategy (NGPES) 2006–2010*. Vientiane, Lao PDR: Committee for Planning and Investment.

- Lawrence, S. (ed) (2008) *Power Surge. The Impacts of Rapid Dam Development in Laos*. Berkely, USA: International Rivers.
- Lehni, M. (2000) *Eco-Efficiency – Creating More Value with Less Impact*. Geneva, Switzerland: World Business Council for Sustainable Development.
- Maunsell Limited and Lahmeyer GmbH (2004) *Power System Development Plan for Lao PDR. Final Report, Volume A: Main Report*.
- McCully, P. and S. Wong (2004) 'Powering a Sustainable Future: The Role of Large Hydropower in Sustainable Development'. Paper presented at UN Symposium on Hydropower and Sustainable Development, Beijing (27–29 October).
- Mehlum, H., K. Moene and R. Torvik (2001) 'Institutions and the Resource Curse', *The Economic Journal*, 116 (1), 1–20.
- Mekong River Commission Secretariat (2010) 'Results of Strategic Environmental Assessment of Hydropower on the Mekong Mainstream Released'. Media release. www.mrcmekong.org/MRC_news/press10//Results-of-SEA-of-hydro-Mekong-mainstream15-Oct-10.htm.
- Messerli, P., A. Heinimann, M. Epprecht, S. Phonesaly, C. Thiraka and N. Minot (eds) (2008) *Socio-Economic Atlas of the Lao PDR – An Analysis Based on the 2005 Population and Housing Census*. Bern: Swiss National Center of Competence in Research (NCCR) North-South and University of Bern.
- Middleton, C. (2008) 'Perspective from the Mekong Region: New Financiers and Familiar Problems in P. Bosshard (ed) *New Financiers and the Environment, Ten Perspectives on How Financial Institutions Can Protect the Environment*, pp. 12–15. USA, Berkley: International Rivers.
- Ministry of Planning and Investment, Water Resources and Environment Administration, UNDP Lao PDR and UNDP/UNEP PEI (2009) '*Poverty Environment Initiative (PEI) Framework in Lao PDR*'. www.unpei.org/PDF/LAO-PEI-Project-Framework-Lao-PDR-26Mar09.pdf.
- MRC (Mekong River Commission) (2007) *Mekong River Commission Annual Report*. Vientiane: MRC.
- MRC (Mekong River Commission) (2009) 'Initiative on Sustainable Hydropower'. Draft Work Plan – February. Vientiane: MRC.
- Osborne, M (2004) 'River at Risk. The Mekong and the Water Politics of Southeast Asia'. Lowy Institute Paper 02. New South Wales: Longueville Media.
- Sachs, J.D., and A.M. Warner (2001) 'Natural Resources and Economic Development. The Curse of Natural Resources', *European Economic Review*, 45 (4–6), 827–838.
- Scanlon, A., R. Kile and B. Blumstein (2004) 'Sustainable Hydropower – Guidelines, Compliance Standards and Certification'. Paper presented at United Nations Symposium on Hydropower and Sustainable Development, Beijing (27–29 October).
- Shaw, S., A. Cosbey, H. Baumüller, T. Callander and L. Sylavong (2007) '*Rapid Trade and Environment Assessment (RTEA) – National Report for Lao PDR*'. Winnipeg: The International Institute for Sustainable Development.
- STEA (Science Technology and Environment Agency) (2006) '*National Policy. Environmental and Social Sustainability of the Hydropower Sector in Lao PDR*'. Vientiane: STEA.
- STEA (Science Technology and Environment Agency). no date. '*Public Participation in Development Projects in Lao PDR*'. Environmental Research Institute, Lao People's Democratic Republic. http://pdf.wri.org/mekong_governance_mreg_eri.pdf.

- WBCSD (The World Business Council for Sustainable Development) (2000) *Creating More value with Less Impact*. Geneva: WBCSD.
- WCD (World Commission on Dams) (2000) *Dams and Development, A New Framework for Decision-making*. London and Sterling: Earthscan Publications Ltd.
- WMPA (2010) 'The Nam Theun 2 Watershed Management and Protection Authority'. WMPA homepage. www.nt2wmpa.gov.la/.
- World Bank (2005) *The Lao Environment Monitor 2005*. Washington: World Bank.
- World Bank (2009a) 'Directions in Hydropower'. Washington: World Bank. http://siteresources.worldbank.org/INTWAT/Resources/Directions_in_Hydropower_FINAL.pdf.
- World Bank (2009b) *Project Appraisal Document on a Proposed Grant in the Amount of SDR 5.0 Million to the Lao People's Democratic Republic for a Technical Assistance for Capacity Building in the Hydropower and Mining Sectors Project*. Report No: 5091 8-LA. Washington: World Bank.
- World Bank (2010a) *The Changing Wealth of Nations: Measuring Sustainable Development in the New Millennium*. World Bank: Washington.
- World Bank (2010b) 'Nam Theun 2 Hydropower Project, Project Overview and Description'. <http://siteresources.worldbank.org/INTLAOPRD/Resources/ProjectOverviewandDescriptionJuly2010updateFINAL.pdf>.
- World Bank (2010c) 'The Socio-Geography of Mining and Hydro in Lao PDR. Analysis Combining GIS Information with Socioeconomic Data'. Technical Note – Draft.
- World Bank (2010d) 'World Bank Group Welcomes Strategic Environmental Assessment of Mekong Mainstream Dams'. <http://web.worldbank.org/WBSITE/EXTERNAL/COUNTRIES/EASTASIAPACIFICEXT/CAMBODIAEXTN/0,,contentMDK:22740418~menuPK:293861~pagePK:2865066~piPK:2865079~theSitePK:293856,00.html>.
- World Bank (2011) 'World Development Indicators'. <http://data.worldbank.org/data-catalog/world-development-indicators> (accessed 17 March 2011).
- Worley International Ltd. and Lahmeyer International (2000) *Hydropower Development Strategy Study (HDSS)*, Hydropower Strategy Final Report, Volume A.
- WRCCS (Water Resources Coordination Committee Secretariat) (2008) 'Nam Theun Nam Kading River Basin Profile. Lao Environmental and Social (LEnS) Project, Sub-project on Integrated River Basin Management in the Nam Theun Nam Kading River Basin'. Vientiane: Water Resources and Environment Administration.
- WREA (Water Resources and Environment Administration) (2008) 'National Water Resources Profile. The Nam Ngum River Basin Development Sector Project'. Vientiane: Department of Water Resources, the Asian Development Bank (Loan 1933-LAO) and Agence Française de Développement.
- WSSD (World Summit on Sustainable Development) (2002) 'Plan of Implementation'. http://ec.europa.eu/environment/wssd/documents/wssd_impl_plan.pdf.



Openings towards integrated water resources management in Lao PDR

SARI JUSI, *Researcher, Department of Regional Studies, University of Tampere, Piminkatu 53 B, 33014 Tampere, Finland. E-mail: sari.jusi@uta.fi*

ABSTRACT

The specific objectives of the paper are to assess the existing institutional situation associated with water resources and the state of developing Integrated Water Resources Management (IWRM) process in Lao People's Democratic Republic and based on that assessment, to shed light on problems and constraints in water sector and possibly suggest opportunities to meet the emerging challenges/the implementation of policies and institutional strengthening processes that will lead to improved management of water resources and governance. The key developmental challenge for enhancing good water resources governance in the country is the establishment of sustainable, effective and integrated approach to water resources management. To reach this, several objectives are to be fulfilled: integrated, intersectoral, and multi-objective decision making about water resources at the basin scale; broad participation and empowerment of stakeholders in water resources decision making; effective coordination among sectors and institutional scales; strong, effective, and culturally appropriate institutional, policy, and legal frameworks that reinforce integrated, accountable, participatory, and sustainable management and that minimize corruption; and informed and science-based decision making.

Keywords: Integrated; water resources management; good governance; river basin; Lao PDR.

1 Background and context

The Lao People's Democratic Republic (Lao PDR) has rich and varied natural resources such as minerals, hydro-electric power and forestry, of which water is the most important and vital for the country's economic development. Water sector is structured largely around the various uses of water such as hydropower, water supply, irrigation, wastewater and fisheries in Lao PDR. National water resources are still at a relatively low level of development: the irrigated area is only 20 percent of the national paddy area while hydropower production is only at two percent of its potential of 30,000 megawatts [1]. Increasingly, there are conflicts between rural and urban communities, between agriculture and industrial/domestic use, and environmental use [15, 20, 21, 38]. Other issues, such as flooding and drought, watershed degradation and water pollution do occur but are generally dealt with from case to case basis [33]. Water resources in the Lao PDR also have regional significance: over 33 percent of the total Mekong River flow is generated in Lao PDR watersheds [2]. Lao PDR seeks to play its part in the Mekong River Commission (MRC) system [31].

The increasing focus on water governance, Integrated Water Resources Management (IWRM) and demand-driven approaches marks an important shift in how water is being governed in terms of equitable distribution and efficiency [23, 34]. Good water governance requires effective socio-political and administrative systems adopting an integrated water resource management approach with transparent and participatory processes that

address ecological and human needs. The key issues of good governance and comprehensive water resources management are stakeholder involvement at all levels both horizontally and vertically, the concept of participation and co-ordination between different sectors, and inclusion of local level in planning and decision-making [8, 10, 24].

Sound and effective governance of water resources and related services are paramount to facilitating and supporting an enabling environment for Integrated Water Resources Management [34]. IWRM is about strengthening frameworks for water governance to foster good decision-making in response to changing needs and situations. IWRM demands a new framework within which there may be a need for significant changes in existing interaction between policies, laws, regulations, institutions, and civil society. The capacity to implement these changes depends therefore on changes in governance. In the last few years IWRM has been accepted as a means to ensure equitable, economically sound and environmentally sustainable management of water resources and provision of water services.

IWRM concept was already recognised in Agenda 21 of the UN Conference on Environment and Development in Rio de Janeiro in 1992, to a large extent based on the four Dublin Principles developed earlier that year. The UN Conference on Water and Development in Dublin in January 1992 consolidated the four "Dublin principles." (1) the holistic principle; (2) the participatory principle; (3) the gender principle; and (4) the economic principle, which provided an important "mind set" for water resources development and management. The concept of

IWRM is amorphous and there are many interpretations of it [5]. Here, the rather universal definition of IWRM “as a process that promotes the coordinated development and management of water, land and related resources in order to maximize the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems” defined by GWP [9] is used [see also 7, 6, 28, 30]. Decentralisation and the subsidiarity principle play a key role in this process [13, 25]. It is typical for IWRM to be undertaken in a river basin context because river basins form the natural unit to manage water resources [3].

Since the Lao Government’s development strategy emphasizes poverty reduction and economic growth through improved management of water resources, IWRM is necessary in reinforcing links and synergies between water and land use, the environment, and sustainable development [2]. To foster the adoption of an IWRM approach, the Government has focused on key areas in agriculture and hydropower to optimize the water resources. In the past few years, the Government has introduced various legislative and institutional measures to manage water resources efficiently and effectively. The Lao Government is currently developing integrated water resources management for the Nam Ngum Basin with assistance from, among others, the Asian Development Bank (ADB). An integrated approach to water sector planning and management is imperative, yet this is an area where considerable institutional and technical development is required in Lao PDR [2].

The paper is based on analysing official government documents and relevant literature, and a series of interviews with government and NGO staff during visits to Lao PDR in February-March, and October-November 2004. The following chapter presents water related legal and institutional framework of the country discussing institutions, organizations and policies in relation to water management. The current state of the country’s IWRM process is then outlined followed by a glance at the state of river basin organization and planning at the Nam Ngum River Basin. Lastly, the analysis of key problems and opportunities and the concluding remarks are presented.

2 Water related legal and institutional framework

Twelve water agencies and another ten have a direct interest in water resources [2, 16, 22]. Water resources management and planning have generally been based on an administrative boundary (i.e. district, provinces) rather than on a hydraulic one (i.e. sub-watershed) with little interagency coordination in the past. Water resource management is largely driven by hydropower development with limited reference to multi-sectoral water management issues [4]. Plans are project-oriented and are not integrated within basins or across sectors. For example, hydropower, irrigation and rural and urban water supply are developed and managed by separate agencies under separate plans. [2, 4]. Moreover, water management is usually in the hands of top-down institutions, which are not as effective as they should be. There has been no coordinated system by which both national

goals from above, and grass-roots needs from below, are being balanced in the planning and management of water resources. Due to fragmented and uncoordinated development and management of the resource there is a loss of benefits from water resource use and from the limited financial and human resources that are available [18, 22, 36].

The policy of decentralization and the principle of subsidiarity, which state that water should be managed at the lowest appropriate level [10] are now being implemented in Lao PDR. Decision-making power is being moved from central government to the provincial level. This includes formulating annual work programmes, project planning, implementation, operation and maintenance. Service provision and implementation of the plans are also being transferred to local agencies and communities, such as provincial water supply agencies, irrigation water user associations [for more information, see 14], and village water supply management committees [15, 21, 22].

In 1998, the Water Resource Coordination Committee (WRCC) was established as a national apex body and it is mainly aimed at developing and utilizing the water resources, improving the co-ordination of multi-sectoral activities involving various water uses and also defining and managing water allocations, both at the national and local levels [5, 9, 22]. The WRCC is chaired by Science Technology and Environment Agency and has also representatives from the following Ministries: Agriculture and Forestry, Industry and Handicrafts, Communications, Transport, Post and Construction and Public Health, and Justice. There is also a representative from each of the following bodies: the Lao National Mekong Committee, the Lao Women Union and the Lao National Front for Construction. There is minimal representation of civil society on the WRCC. [11, 12]. The WRCC is an important initiative for co-ordination at the national level enabling the Government to overcome the current fragmented management of water resources.

The WRCC has an important role in all of the Integrated Water Resource Management functions [22, 36]. The WRCC has made a decision that each main tributary catchment of the Mekong River in the Lao PDR, will be classified as a river basin where planning uses IWRM, to ensure that the effects of development on downstream areas are fully considered, starting with the Nam Ngum River Basin [2]. However, the WRCC needs to be strengthened to play a more effective role in water sector coordination and to assist the Government to move toward more effective institutional arrangements for water and related natural resource management [19].

The mandate of the Lao National Mekong Committee (LNMC) is to formulate policy, strategic plans, water resources related development projects and programmes within the Mekong basin, taking into consideration the protection of the environment and ecological balance, and community participation. The LNMC is an important vehicle for linking domestic processes to the international governance framework of the Mekong River Commission [4, 21]. The Mekong River Commission has also been working to develop concepts if IWRM among its riparian countries, which has raised the awareness, and to some degree the capacity for water resources management within the LNMC

and its secretariat. The role of WRCC and LNMC is somewhat overlapping in the Law on Water and Water Resources Implementation Decree and in other legislation [31].

The Water and Water Resources Law of 1996 sets out a legal framework for development in the water sector. It sets out the principles, rules, and measures relative to the administration, exploitation, use and development of water and water resources in the Lao PDR to preserve sustainable water resources and to ensure its quantity and quality providing for people's living requirements, promoting agriculture, forestry, and industry, developing the national socio-economy and ensuring that no damage is caused to the environment [16, 33]. Many issues in the Water and Water Resources Law, particularly the roles and responsibilities of various agencies for specific activities such as water allocation and the process for licensing water users, as well as the necessary legal documents to accompany the Law and make it effective, need to be developed [20]. There is scant mention of the basic principles of IWRM [11].

In 2001, a Prime Minister's decree was issued to implement the law on water resources. The implementation regulations cover issues such as water allocation, licensing of water use, fund for watershed and water resources protection, groundwater use, and powers and duties of central and local governments [12]. In 1998 a National Water Sector Profile (NWSP) and Water Sector Strategy and Action Plan (WSSAP) were prepared for Lao PDR by the Water Resources Coordination Committee. The Water Sector Strategic plan addresses cross-sectoral issues by emphasising appropriate policy, community education and data management. It consists of a vision and mission for the water sectors, a set of objectives and descriptions of key result areas necessary for achieving the objectives with short-term goals and activities within those key result areas [1, 11, 22]. Although, that Strategy was not formally approved by the Government, some of the proposed actions have been implemented [18].

The Draft Policy on Water and Water Resources (2000) is in the final approval stage and is to be the basis for any policies developed for the water and water resources sub-sectors [21]. The Environment Protection Law (1999) together with the above mentioned laws form the legal cornerstones supporting integrated water resources management in Lao PDR. Although Lao PDR has made progress in recent years in developing water resources policy, legislation, regulations and guidelines, water management legislation is still fragmented and vests responsibility in a number of different agencies. Part of the policy remains at a general level, without sufficient details and corresponding legal documents to allow full implementation.

3 Steps to IWRM

Lao PDR faces a challenge in improving its planning and management of water resources, in line with the approach of integrated water resource management at the same time as strong water resource development by various sectors is taking place. IWRM is needed to develop, at a minimum, framework or guideline plans that will direct the sectoral and localized project planning to be

done in a way, which minimizes negative impacts and promotes the achievement of broad national objectives. [21, 22]. IWRM involves managing and conserving water for the greatest national benefit, rather than allowing each development sector or user to exploit water resources for their own purpose in an uncoordinated manner [17].

Although integrated planning and management of river basin water resources have not been carried out in the past, some steps have been taken to prepare for a more integrated approach to water resource management. The Water and Water Resources Law and a prime ministerial implementing decree indicate that water resource planning and management will be done both at a national level and within river basins [21, 32]. At the national level, the WRCC is to act as an inter-agency coordinator for sustainable use of water resources based on IWRM and to facilitate the implementation of the Water Law and other resource and planning legislation [2, 36]. Water Sector Strategy and Action Plan (WSSAP) has also established linkages between national socio-economic goals and water resources, and identified the national objectives, strategies, and priorities for water resource management, including institutional issues. At the river basin level, the WRCC is to foster and support the development of river basin committees. The WRCC has also made a decision that each main tributary catchment of the Mekong River in the Lao PDR, will be classified as a river basin where planning uses IWRM, to ensure that the effects of development on downstream areas are fully considered [2].

The legislation also indicates some general responsibilities of the Lao National Mekong Committee Secretariat (LNMCs), the Ministry of Agriculture and Forestry (MAF) and others regarding water resource assessment and planning. IWRM is in line with the basic premise underlying the Water Law as well as its recent decentralization policy representing an important opportunity to develop water resource management systems under the WRCC attuned to the Government's requirements [2]. This legislation, however, is still at a general level and many details remain undeveloped regarding IWRM, river basin water resources planning and management [21, 32].

Community participation is also vital as it leads to government efficiency, ownership of policies and actions by the community. Participatory approaches have been implemented in a minor extent in Lao PDR. Better communication and access to information sharing should be promoted to help establish accountable and transparent systems and reduce corruption. Consultation activities should also be directed to providing openness and transparency in IWRM decision making as part of improved water sector governance. Consultation on draft policy and legal decisions, water resource planning scenarios, and similar topics should be carried out with stakeholders in Lao PDR [22].

The Government of Lao PDR has been restructuring and formulating long-term strategies for addressing the complex issues of natural resources management, socio-economic development and poverty alleviation in a more holistic manner. IWRM strategies and plans need to be linked to and built on other national plans and strategies, including Poverty Reduction Strategy Paper (PRSP) and National Socio-Economic Development



Figure 1 A view of Nam Ngum River Basin.

Plan (NSED) to meet the Millennium Development Goals (MDGs) [10]. International benchmarking and lessons learned can be helpful to motivate and guide the development of a water strategy, but the final decisions are a national responsibility [4].

3.1 Pilot river basin management – Nam Ngum River Basin

It appears that some rivers in Lao PDR are now reaching a stage where improved and comprehensive river basin water resources planning and management is becoming necessary at the river basin level due to increasing development (particularly hydropower), increasing interaction between watershed and water users, and increasing interest in water allocation in the Mekong basin [17]. The Government has made a steady progress in water sector and river basin planning since the mid 1990s, however river basin organization and planning is yet at an early stage. Watershed planning and management has already been tested to some extent in Lao PDR [15].

The country is currently setting up a river basin water resource planning process and preparing a basin plan for the Nam Ngum River in the form of Nam Ngum River Basin Development Sector Project (NNRBDSP), which is implemented by the Lao Government with the assistance of the Asian Development Bank and Agence Française de Développement [1, 17]. The Nam Ngum River Basin (NNRB) has been selected as the first river basin in which to develop river basin water resources planning procedures due to the existing and planned water sector investments as well as its proximity to the capital, Vientiane [17]. The watershed resources of Nam Ngum Basin are already utilised significantly through diversions, reservoir management, hydropower generation and irrigation. Water is a primary resource in the Nam Ngum basin and will be a limiting factor in achieving economic and social development goals unless sustainable and IWRM principles are followed.

Optimal use of water resources in the country is the long-term goal of the Nam Ngum River Basin Development Sector Project. Three immediate objectives of the NNRBDSP are to: (i) foster and institutionalize the IWRM approach in the mainstream management process of the Government both at the central as well as at the provincial and district levels, (ii) support investment interventions in relatively degraded parts of NNRB

to ensure sustainable watershed management and (iii) to provide livelihood opportunities for the poor and communities of ethnic groups [20]. Leading the development of planning of a river basin water resources management plan and river basin water resources process is the responsibility of the WRCC under the NNRBDSP. Other agencies, which are directly involved in this process include the Department of Electricity, Lao National Mekong Committee Secretariat, Department of Meteorology and Hydrology and the provinces in the NNRB.

IWRM component will incorporate the following activities: (i) development of an updated WRCC Action Plan and development and implementation of a WRCC capacity building plan; (ii) policy and legislation development (including regulations and guidelines for addressing key water management issues and implementing river basin plans); (iii) data and information management (including development of a coordinated national water resources data management and sharing system); (iv) water resources planning coordination; (v) training (including training needs assessment, planning, coordination and evaluation for IWRM across the Project components); and (vi) public awareness and consultation (including development and implementation of a public awareness strategy). Achievement of these objectives and development of the related capacity in WRCCs will help ensure that the WRCC is seen as a valuable, effective, and sustainable water sector coordinating agency at both the central as well as the river basin level [2].

The aim is to pursue the basin water resources planning in parallel with the refinement and updating of a National Water Resources Strategy and Action Plan under the NNRBDSP. However, the Project has not yet been able to communicate this recommendation to the Lao Government [38]. The National Strategy may give guidelines, standards, goals and principles, which will help to guide basin water resource management [17, 31]. The basin water resources plan will, in turn, be an ‘umbrella’ for planning at the sub-basin or watershed level through Integrated Watershed Management plans. This watershed planning has been developed and tested in the past and is being further applied under the NNRBDSP. It is expected that there will be interaction between these types and scales of plans (national, basin, sub-basin) as well as interaction with the larger national socio-economic development planning framework, as experience is gained. This pilot project aims to test planning procedures and legal and institutional arrangements, which can be used or adapted to other basins in the future [17].

The design of the Project will afford a first real opportunity to both central and provincial departments to implement the IWRM approach through hands-on activities that are closely interlinked [1]. But it appears that there is rather little legislation or approved policy on river basin water resource planning and the institutional and other arrangements to support it. Steps will need to be taken in the NNRBDSP to develop both working guidelines and formal legislation to address these gaps. In particular a clear legal basis of River Basin Committees and for the development, approval and implementation of basin water resource plans should be prepared. It is expected that a Nam Ngum River Basin Committee (NNRBC) will be established within the next years [17, 38].

It is recommended that the basin water resource planning process should be started on an informal basis. During this process the specific legislation needs should be identified and draft legislation should be prepared. Government approval of this legislation would likely be required before the final approval and implementation of a basin water resources plan [31]. Currently, it seems that the ADB and the Lao Government are proceeding with separate activities to carry out environmental impact assessment (EIA) and to formalize concession agreements with hydropower developers. Therefore, there seems to be a need to coordinate the EIA and river basin planning process and to use WRCC and river basin committees more actively in coordinated water resource management [38].

4 Analysis of key problems

During the past years, important progress in the improvement of water resources management in the Lao PDR has been made. Although the elements of a coherent and integrative institutional approach to water resources management are emerging, the water sector planning and development process has not yet institutionalized integrated water resources management (IWRM) approach. No river basin organizations yet exist. The current situation might be best characterized as one of flux, in which some agencies have conflicting roles such as service provider and regulator. This could result in ineffective implementation of government policies and enforcement of rules and regulations [22, 33]. Implementation of water sector policies and laws is limited and some of the policies remain at a general level, without sufficient detail and corresponding legal documents to allow full implementation [4, 22]. While the Water Law sets out broad relative priorities for water use, there is as yet no institutionalized mechanism for resolving water use conflicts and competition. There is an urgent need for the development of further legislation or decrees for sub-sectoral activities, as well as the necessary legal documents to accompany the Water Law and make it effective. External assistance is also required in water sub-sector agencies to develop regulations [16].

In Lao PDR, the most significant institutional problem in the water sector is the inadequate coordination among the key central agencies and provincial departments and the loose lines of communication between the national agencies and their provincial counterparts [2]. Agency responsibilities for water resource management are fragmented and many gaps exist and there is no lead water resource management agency. Water Resources Coordination Committee is still at a low level of membership (chaired at vice-minister level, with technical level members) and capacity (limited staff capacity and resources) and it is largely dependent on donor funding [4]. It seems that the Government of Lao does not seem to have really understood what IWRM means or to put the necessary resources into implementing IWRM through WRCC and others relevant organizations [38].

The roles of the WRCC and LNMC committees are complementary with the WRCC being responsible for water development and management within Lao PDR and the LNMC being

responsible for the international obligations and opportunities in relation to water and aquatic resources. It has however, resulted in the duplication of some functions within the supporting secretariats, which through cooperative arrangements could be overcome [Ibid]. Moreover, LNMC relies very much on MRC and does not have enough capacity or authority to properly implement its IWRM coordination activities [38].

An effective IWRM system requires reliable information on the availability, use and quality of surface and groundwater in the basin [28]. Currently there is no national water resource information management system and water related data is fragmented and scattered among agencies. Access to data and other issues limit the use of information in decision-making [4, 15, 29]. This rather chaotic situation is a major constraint to the development of the water sector policies and strategies, as well as water resource project planning [15]. Resolving the issue of data information and management will also be a critical for the achievement of the objectives of the Nam Ngum River Basin Sector Development Project [22].

The government has a policy to decentralize planning and development to the provinces, with broad control and guidelines set at the central level. The state has administrative units at the national, provincial, district, and village levels, but there has been little real devolution of power [29]. Local empowerment is hindered by unaccountable provincial governments and the lack of institutionalised mechanisms for beneficiary participation [Ibid]. Provincial capacity for integrated water resource management is also very low [4]. While devolving the responsibility from the central level to provinces and local authorities tends to foster greater community input, it does not allow cross-sectoral and upstream/downstream impacts within river basins to be taken into account. Control of natural resources and cross-sector coordination needs to be considered in planning this decentralization [22]. As a result of decentralization, institutional strengthening and capacity building need especially of provincial and local level is increased [20]. IWRM needs to be fostered at the national level for interagency and at the decentralized level for interprovincial coordination [2].

A pre-requisite for success is capacity-building throughout the water sector because IWRM is a new activity and because the water sector traditionally focuses on development rather than management and regulation. Overall, the capacity of administration to act is low at all levels, but especially so at the district level, where the actual project implementation and community participation should take place [35]. Capacity constraints exist because of low educational levels, poor incentives, and inappropriate personnel and recruitment policies. A major structural problem is that public administration is still based on bottom-up reporting system with no institutionalised channels for interministerial communication. At the institutional level, job descriptions are missing and there is no clarification of roles and responsibilities [29].

Some IWRM training has been carried out, but it is fragmented and has not resulted in an understanding of IWRM or implementation of necessary functions [4]. Effort in the area of institutional strengthening and capacity building should, therefore, focus on

provincial and local levels and incentives for government employees should be biased to favour the provinces. In all aspects of capacity building, at the central, provincial and local levels, efforts should consider and promote the capabilities of women. The actual progress in participatory approaches has been very modest and no national program for public awareness and participation exists [4]. There is an urgent need for improvement and promoting public awareness programmes and dissemination of information related to existing laws, decrees and regulations of the water sector [21].

5 Concluding remarks

In the past few years the concept of Integrated Water Resource Management has come to the fore as the means to ensure equitable, economically sound and environmentally sustainable management of water resources and provision of water services. Problems relating to water and environment are expected to intensify in the future and water resources need to be managed in an integrated and holistic manner in Lao PDR. There are encouraging signs that water governance reforms are taking place in the country, promoting and facilitating coherent policy frameworks and institutional integration instead of fragmentation and conflict. The Lao Government is currently considering the formation of a new ministry on the natural resources and environment. This will likely include a department responsible for water resource management. If this is approved by the Government, it will be an important step toward a stronger institutional basis for IWRM [38].

But much remains to be done to achieve the objectives of integrated approaches and sustainable development of water resources. The most severe weaknesses in the water sector are lack of systematic coordination and integration of government structures and agencies and weak capacity for integrated water resources management. The crucial part of IWRM is also exchanging information and experiences and learning from each other (networking). Additionally, Lao PDR as sharing transboundary Mekong River could also focus on the challenges relating to sharing water resources, not just as an added level of integration but as a potential catalyst to more efficient and effective national decision-making. To achieve the Millennium Development Goals Lao PDR should also concentrate on harmonizing water resources development and management to achieve those goals and targets.

To sum up, the key developmental challenge for enhancing good water resources governance in Lao PDR is the establishment of effective, sustainable and integrated approach to water resources management. To reach this, several objectives are to be fulfilled: (i) integrated, intersectoral, and multi-objective decision making about water resources at the basin scale; (ii) broad participation and empowerment of stakeholders in water resources decision making; (iii) effective coordination among sectors and institutional scales; (iv) strong, effective, and culturally appropriate institutional, policy, and legal frameworks that reinforce integrated, accountable, participatory, and sustainable

management and that minimize corruption; and (v) informed and science-based decision making.

References

1. ASIAN DEVELOPMENT BANK (2004). Country Paper. National Water Sector Apex Body. Lao PDR: Water Resources Coordinating Committee. Regional Meeting of National Water Sector Apex Bodies. Leadership in Water Governance, 18–21 May 2004, Hanoi, Viet Nam.
2. ASIAN DEVELOPMENT BANK (2002). Report and Recommendation of the President to the Board of Directors on a Proposed Loan to the Lao People's Democratic Republic for the Nam Ngum River Basin Development Sector Project. ADB RRP:LAO 33356.
3. ASIAN DEVELOPMENT BANK (2001). Water for all: the water policy of the Asian Development Bank. Philippines: Manila.
4. BIRC, A. (2005). *Benchmarking National Water Sector Capacity in the Lower Mekong Basin Countries*. Discussion Paper. World Bank-ADB Mekong Water Resources Review 2005.
5. BISWAS, A. (2004). "Integrated Water Resources Management: A Reassessment. A Water Forum Contribution," *Water International*, 29(2), 248–256.
6. COLLENTINE, C., FORSMAN, Å., GALAZC, V., KALLNER BASTVIKEN, S. and STÅHL-DELBANCO, A. (2002). "CATCH: Decision Support for Stakeholders in Catchment Areas," *Water Policy*, 4(5), 447–463.
7. EUROPEAN UNION (2000). Towards Sustainable and Strategic Management of Water Resources. European Commission. Luxembourg: Office for Official Publication of the European Communities.
8. FOURTH WORLD WATER FORUM (2006). *Integrated Water Resources Management: Strengthening Local Action*. Thematic Document, Framework Theme 2. Prepared by the Global Water Partnership. Mexico City.
9. GWP (2004). Informal Stakeholder Baseline Survey. Current Status of National Efforts to Move Towards Sustainable Water Management Using an IWRM Approach. Global Water Partnership. Version 1.
10. GWP (2003). Dialogue on Effective Water Governance: Learning from the Dialogues. Global Water Partnership. <http://www.gwpforum.org/gwp/library/Effective%20Water%20Governance.pdf>
11. HIRSCH, P., MØRCK JENSEN, K., BOER, B., CARRARD, N., FITZGERALD, S. and LYSTER, R. (2006a). "National Interests and Transboundary Water Governance in the Mekong," http://www.mekong.es.usyd.edu.au/projects/mekwatgov_mainreport.pdf
12. HIRSCH, P., MØRCK JENSEN, K., BOER, B., CARRARD, N., FITZGERALD, S. and LYSTER, R. (2006B). "National Interests and Transboundary Water Governance in the Mekong," Attachment 3: The Legal Framework for Mekong Water Governance.

13. INFO RESOURCES FOCUS (2003). "Integrated Water Resources Management: A Way to Sustainability," No.1. http://www.inforesources.ch/pdf/focus1_e.pdf
14. JUSI, S. and VIRTANEN, M. (2005). "Irrigation Management Transfer in the Lao PDR: Prospects and Issues," *International Journal of Development Issues*, 4(2).
15. LAO PEOPLE'S DEMOCRATIC REPUBLIC & DANIDA (2002). Ministry of Agriculture and Forestry. "National Capacity Building Project. Evolving Concept, Practice and Issues of Integrated Watershed Management in Lao PDR.
16. MANIVONG, K. (2005). *Country Paper: Water Allocation and Water Right Situation of Lao PDR*. NARBO Thematic Workshop on Water Allocation and Water Right. Hanoi, Vietnam, 5th–9th December 2005.
17. NNRBDSP (2005a). Assessment of Water Resources Data and Information System Management in Lao PDR. Draft. Nam Ngum River Basin Development Sector Project. Water Resources Coordination Committee Secretariat.
18. NNRBDSP (2005b). Concept Note on National Water Resource Planning in Lao PDR. Draft. Nam Ngum River Basin Development Sector Project. Water Resources Coordination Committee Secretariat.
19. NNRBDSP (2004). Draft Inception Report. Nam Ngum River Basin Development Sector Project. ADB Loan 1933-LAO, AFD Grant CLA 1048 01H, Lao PDR.
20. NONTHAXAY, P. (2004). Country Report – Lao PDR. Water Resources Management in Lao PDR. Training Program on Integrated Water Resources Management and Strengthening of River Basin Committees. 26 July – 6 August 2004, Bangkok and Chiang Mai, Thailand.
21. NONTHAXAY, P., BOULAPHA, C., PHANRAJSAVONG, C., TI, LE HUU and FACON, T. (2004). From National Water Vision to Action: A Framework for Integrated Water Resources Management in the Lao People's Democratic Republic in Ti, Le Huu and Facon, T. (2004) From Vision to Action. A Synthesis of Experiences in Least-Developed Countries in Southeast Asia. The FAO-ESCAP Pilot Project on National Water Visions – Phase 2. RAP Publication 2004/32. Bangkok, December 2004.
22. NONTHAXAY, P. and SOUVANNALATH, S. (2004). Water Resources Management in Lao PDR. People-centred Approaches to Water and Environmental Sanitation. 30th WEDC International Conference, Vientiane, Lao PDR, 2004.
23. RCSD (2003). International Conference Politics of the Commons: Articulating Development and Strengthening Local Practices. Regional Centre for Social Science and Sustainable Development. Chiang Mai, Thailand, July 11–14, 2003.
24. ROGERS, P. and HALL, A. (2003). Effective Water Governance. TEC Background Papers No. 7. Global Water Partnership Technical Committee. GWP Secretariat, Stockholm.
25. ROSENDO, S. and BROWN, K. (2004). "The Limits to Integration: Critical Issues in Integrated Conservation and Development," http://www.iacp2004.org.mx/downloads/paper_207.pdf
26. SAVENIJE, H.H.G. and VAN DER ZAAG, P. (2000). "Conceptual Framework for the Management of Shared River Basins; with Special Reference to the SADC and EU," *Water Policy*, 2(1–2), 9–45.
27. UN (1992). Agenda 21. United Nations, New York.
28. VAN HOFWEGEN, P. (2000). Assessment of Institutional Frameworks for Integrated Water Resources Management. Proceedings of an International Workshop "Integrated Water Management in Water-Stresses River Basins in Developing Countries: Strategies for Poverty Alleviation and Agricultural Growth," Loskop Dam, South Africa, 16–21 October 2000.
29. WESCOTT, C. (2001). Key Governance Issues in Cambodia, Lao PDR, Thailand, and Vietnam. Asian Development Bank. Philippines: Manila.
30. WORLD WATER COMMISSION (2000). "A Water Secure World. Vision for Water, Life and the Environment," http://www.worldwatercouncil.org/fileadmin/www/Library/Publications_and_reports/Visions/CommissionReport.pdf
31. WRCC (2006). Nam Ngum River Basin Development Draft Final Report. Institutional Issues Report, Volume 2. ADB TA3544-LAO. Implementing Integrated Water Resources Management in the Nam Ngum Basin. Water Resources Coordination Committee. Bceom Société D'ingénierie and Mekconsultants. Lao PDR: Vientiane.
32. WRCCS (2006). Concept Note on River Basin Water Resources Planning in Lao PDR. Draft. Water Resources Coordination Committee Secretariat. Nam Ngum River Basin Development Sector Project.
33. WRCCS (2005). Strategic Planning for Integrated Water Resources Management in the Lao People's Democratic Republic in ESCAP, 2005. Good Practices on Strategic Planning and Management of Water Resources in Asia and in the Pacific. Water Resources Coordination Committee Secretariat. Water Resources Series, No. 85. United Nations, New York.
34. WWAP (2003). Water for People Water for Life. The United Nations World Water Development Report. United Nations World Water Assessment Programme. Barcelona: United Nations Educational, Scientific and Cultural Organization (UNESCO) and Berghahn Books.

Personal Communication

35. Division Director, Department of Irrigation, Ministry of Agriculture and Forestry.
36. Team Leader, Office of the National Project Manager, Ministry of Agriculture and Forestry.
37. Project Implementation Officer, ADB Lao Resident Mission.
38. Deputy Team Leader, Water Resources Coordination Committee Secretariat.

The Asian Development Bank and the case study of the Theun-Hinboun hydropower project in Lao PDR

S. Jusi

Pinninkatu 53 B, 33014 Tampere, Finland. Tel: +358-50-588-0251, Fax: +358-3-215-7311.

E-mail: sari.jusi@uta.fi; sarijusi@hotmail.com

Received 7 January 2005; accepted in revised form 21 June 2005

Abstract

The Asian Development Bank (ADB) is one of the most influential development institutions in the Greater Mekong sub-region in the push to build large-scale infrastructure including hydroelectric dams. Controversies over big dams in Asia have unveiled the lack of effective governance mechanisms through which all stakeholder interests can be taken into account in resource management decision making. In the case of the Theun-Hinboun hydropower project in Lao PDR, the actions of the ADB have showed inadequacies regarding the project decision making and implementation processes although the project has been economically successful and the ADB has enhanced the country's capacity build-up. The aim of the article is to review the history of the Theun-Hinboun project and identify areas that need to be strengthened recognizing future planning needs, and to identify important future lines of study at Theun-Hinboun. Good governance can be enhanced by institutionalizing participation at the project, district, provincial and national levels including improving inter-agency coordination. An institutional mechanism, which ensures that revenue from the export of hydropower is actually used for poverty alleviation, is needed.

Keywords: Asian Development Bank; Good governance; Hydropower; Poverty reduction; Public participation; Theun-Hinboun project

Abbreviations: ADB, Asian Development Bank; ADF, Asian Development Fund; BOT, build–operate–transfer agreement; DMC, Developing Member Country; EdL, Electricité du Laos; EGAT, Electricity Generating Authority of Thailand; EIA, Environmental Impact Assessment; EMP, Environment Management Plan; FDI, Foreign Direct Investment; FIVAS, Association for International Water and Forest Studies; GMS, Greater Mekong Sub-Region; GoL, Government of Laos; HDSS, Hydropower Development Strategy Study; IEE, Initial Environmental Examination; IFI, International Financial Institution; IRN, International River Networks; IUCN, International Union for Conservation of Nature and Natural Resources; IWRM, Integrated Water Resources Management; Lao PDR, Lao People's Democratic Republic; LWU, Lao Women's Union; MDB, Multilateral Development Bank; NGO, Non-governmental Organization; NT2, Nam Theun 2; OECD, Organization for Economic Co-operation and Development; PPA, Power Purchase Agreement; SIA, Social Impact Assessment; TERRA, Towards Ecological Recovery & Regional Alliances; THPC, Theun Hinboun Power Company Limited; WB, World Bank; WCD, World Commission on Dams.

doi: 10.2166/wp.2006.043

© IWA Publishing 2006

1. Introduction

Hydropower development is and will continue to play a dominant role in any discussions about natural resource management in the Mekong Basin. Among the Lower Mekong Basin countries, the Lao People's Democratic Republic (PDR), later referred as Laos in this paper, has the largest hydroelectric potential, which is an outcome of its abundant watersheds and steep topography (Cheong, 1998). The reason for focusing on Laos and not on some other Mekong region country in this article is that hydropower is considered by the government of Laos to represent the most promising prospect for development of its water resources and national economy. Laos, which is one of Asia's poorest nations, is counting heavily on hydropower development to reach the social and economic development goals of the country. The impact of the export of hydro projects on the Lao economy derives principally from an increase in foreign currency earnings for the government of Laos (GoL) and its subsidiary Electricité du Laos (EdL), which will then be transformed into economic development for the country (ADB, 2001a). Currently the average GDP per capita is about US\$300 with two main growth options, export of hydropower and tropical timbers (ADB, 2001a). Electricity sold to Thailand now represents 30% of exports (World Bank, 2004).

It has been the traditional role of the government to plan, finance, build and manage hydropower projects with the help of multilateral development banks (MDBs) and international aid agencies. Nam Ngum dam, which is the first hydro dam built in Laos, has been the country's main generator of foreign exchange in the past 30 years. Despite the fact that the hydropower sector has played a pivotal role in the economic development of Laos, planning, selection and implementation processes for hydropower projects have tended to be *ad hoc* in character, have experienced insufficient transparency and have not delivered the full potential benefits to the development of Laos (World Bank, 2004). Hydropower investment decisions by the public and private sectors alike have been made on an individual project basis without reference to any plan to ensure that the priority and scope of projects are consistent with optimal development objectives.

This situation has been changing. A Hydropower Development Strategy Study (HDSS) has been prepared to direct hydropower development in an optimal manner to ensure maximum economic benefit, minimum social and environmental damage and proper risk management in Laos (HDSS, 2000). Through the plan, the Ministry of Industry and Handicraft (MIH) tries to maximize the benefits and minimize the negative impacts of future hydropower development by taking into account national and regional planning criteria, optimum basin development constraints and wider financial, economic, institutional, legal, political, social and environmental issues (HDSS, 2000). Additionally, there has been a shift toward a greater role for private capital instead of public funds to finance, build and manage various forms of what used to be termed public goods or public infrastructure, of which hydropower dams (like the Theun-Hinboun project) are one such example (World Bank, 2004).

The paper will explore the role and challenges related to the role of Asian Development Bank in environmental governance, with a particular focus on hydropower project management and the case study of the Theun-Hinboun Hydroelectric Power Project in Laos. Of the major dam projects built or proposed in the Mekong Basin, the Theun-Hinboun project has unique physical features which concurrently result in its positive financial returns (White, 2001). It also has caused negative social and environmental impacts. The aim of the paper is to provide a review of how the ADB has implemented its various safeguard policies and guidelines, like public participation and poverty reduction in the Theun-Hinboun hydropower project and to point out areas that need to be strengthened in future to improve

project planning and decision making. This paper is intertwined with the question of how the ADB can translate the aspirations of cross-cutting issues like poverty reduction, environmental protection and participation into action through the ADB's hydropower projects.

The preparation of this paper has involved analyses of various reports related to the Theun-Hinboun hydropower project representing the Theun-Hinboun Power Company (THPC), different departments and agencies of the Lao government, and international NGOs. ADB documents concerning several of its policies and guidelines, and different national plans and documents of Laos were studied and analysed. Representatives¹ of several key stakeholders at all levels were interviewed in Laos, Thailand and the Philippines from February to March 2004 and analyses of secondary literature of the subject were carried out to look at the subject more closely. The reason for the absence of interviews of local NGOs is that their formation is prohibited in Laos. This paper aims to contribute to the broader debate on the role of multinational funding agencies in the development of natural resources in developing countries.

2. Background and context

Accountable, transparent and efficient systems of governance are seen to be essential for achieving sustained economic and social development. Good environmental and natural resources governance can likewise be seen as facilitating participatory and associative decision-making processes. Environmental and natural resources management needs to find ways to accommodate the multiple claims, perspectives, institutional arrangements and rights that mould the ways in which people use resources and make their livelihoods in everyday settings (Mehta, 2000). Good governance and associative developmental planning arising from the needs of communities is slowly being recognized in Laos. Several interviews (personal communication 1) with international NGOs and aid agencies revealed that participatory processes are included in the development interventions supported and financed by international aid agencies, MDBs and international NGOs, but in practice, the participation of people affected by the project is usually weak and it can be questioned whether participation above village level is even possible within the political system of Laos.

The development of hydropower potential has been at the centre of Laos' development strategy and a pillar of the country's economic development drive since market reforms began in the late 1980s, following advice from the World Bank, the Asian Development Bank, UN agencies and the private sector (Freeman, 2001; ADB, 2003a; 2003d). The future development prospects of Laos depend to a significant degree on the electricity sector being economically efficient and acting as a net contributor to the nation's wealth, as well as effectively providing service to meet the growing electricity needs of the nation's citizens. The positive energy demand projections for Thailand have given the primary justification for hydropower development of major institutional players – donors, lenders and national electricity authorities (Bakker, 1999). Six large and medium hydropower plants and about 30 small and mini hydropower plants provide a total capacity of 600 MW, less than 4% of the potential in Laos (ADB & UNEP, 2004). But even though the country is developing its hydropower, only 20% of all villages and 34% of households have access to electricity (Lao PDR, National Poverty Eradication Program, 2003).

¹ Appendix 1 shows stakeholders and organizations interviewed. Appendix 2 shows the main questions presented to interviewees.

Hydropower development in Laos is often framed with multiple development benefits and objectives in order to provide benefits to the country in terms of poverty alleviation, social development and environmentally sustainable development. These benefits are expected to be delivered directly through on-site developments as well as through indirect budgetary contributions via foreign exchange earnings. On-site developments include the provision of infrastructure such as electricity, roads to access markets, health centres, schools, water supply wells, and so on. Hydroelectric developments are also expected to play key roles in regional development and provide opportunities for tourism and fisheries (Le-Huu & Nguyen-Duc, 2001–2003). Foreign exchange earnings are expected to contribute to the national budget, which is then used at the discretion of the government for its social objectives.

During the last few decades, the complexity of hydropower projects has been acknowledged. Projects are becoming very complex, caught between development and modernization imperatives on the one hand, and increased environmental, livelihood, and human rights limitations on the other (Mathur *et al.*, 2001). The Theun-Hinboun project and the proposed Nam Theun 2 dam in Laos clearly show these pressures that can influence large-scale dam developments. Large-scale and centralist water management, which has previously been the guideline of the MDBs, has been criticized on a number of points; the question of profitability, administrative sustainability, resettlement, ecological sustainability, social or ethnic conflicts, and lack of local ownership and public participation (see for example Öjendal, 2000; Oxfam Community Aid Abroad, 1999).

2.1. Institutional framework for natural resource management in Laos

Developmental planning takes place in a multi-actor environment with a wide range of interests. The main actors in the field of hydropower development in Laos are a group of actors² representing governmental and regional agencies, local communities, industries and external development planners like bilateral aid agencies and donors. There are also several foreign NGOs working on the environment and resource management in Laos. The Lao government does not allow the formation of local NGOs.

The institutional environment for the natural resource management of the Lao government is characterized by the lack of effective institutions, human and technical resources, laws and processes to manage its natural resources in a sustainable way, all of which were highlighted in almost every interview held with different actors in Laos. Achieving efficient coordination among the various ministries and agencies in environmental management presents a major challenge for the GoL (Dethrasavong, 2003). The development of hydropower projects, especially trans-basin diversions such as the Theun-Hinboun Project, should be done in a regional (e.g. river basin) planning context to fit them into an overall development scenario, thus maximizing beneficial development impacts in the project area while minimizing unintended adverse impacts (ADB, 2000c).

In Laos, there is a need to keep pace with international standards for public consultation and to institute guidelines that meet such standards (HDSS, 2000), but there are many constraints facing the Lao governance agencies in respect of public participation. The principle of participation is problematic

² The main actors in the hydropower development sector are the Ministry of Industry and Handicraft (MIH), the Science Technology and Environment Agency (STEA), the Lao National Mekong Committee (LNMC). In the MIH, the Department of Electricity (DOE) has the overall responsibility for all types of electricity projects and is assigned lead responsibility in implementing the environmental assessment (EA) and mitigation processes for electricity projects (Lao PDR, 2000). The Mekong River Commission (MRC) is an influential regional actor.

for the Lao government which has a one-party system of governance that hinders participation and does not allow public debate on development. The capacity and experience of staff in charge of public involvement is limited; there is a lack of regulation of public involvement; a lack of data and information related to public consultation; and financial constraints in respect of public participation (WRI, 2001). This calls for greater and more systematic efforts by government actors to strengthen dialogue and negotiation, and develop participatory and consultative policies and programmes in natural resource management.

The ADB continues to play a significant role in the Greater Mekong sub-region³ where it is one of the largest financiers of large-scale infrastructure including hydroelectric dams, cross-border electricity transmission systems and major roads. The development of infrastructure aims to promote economic growth, reduce poverty and ease local communities' access to services and markets (ADB, 2002a). A part of the ADB's Greater Mekong Subregion Program (GMS) is to support hydropower via the creation of a regional power interconnection and trade arrangements between the Mekong region countries. The ADB sees its role as "mobilizing" private investment for GMS dams and transmission lines with funding from its specially created GMS portfolio (Ryder, 2004).

The uneven distribution of energy resources in the GMS provides a compelling economic reason for the expanded sub-regional cooperation in energy among the GMS countries. Countries that have a large demand for energy, such as Viet Nam and Thailand, do not have sufficient energy resources while countries with low economic activity, such as Laos and Myanmar, have large potential energy supplies, in terms of hydropower and gas resources. With the establishment of the GMS Program, energy development in the GMS has moved increasingly towards integration, particularly in the power sub-sector. Integration through transmission grid interconnection will bring about improved efficiency and competitiveness for the GMS economies. Economic benefits will result from complementary energy resources, exchanges of base for peak energy, load diversity, increased supply reliability, reduced reserve capacity requirements and reduced system losses. Moreover, sub-regional efforts to strengthen energy institutions, through cooperation in data exchanges and training of energy professionals, are critical for the success of national rural electrification and its strong anti-poverty dimensions (ADB, 2000b).

3. Description of the Theun-Hinboun Hydropower Project

The Theun-Hinboun Hydropower Project is a 210 MW trans-basin water diversion project which cost US\$260 million to construct and is currently the largest foreign exchange source in Laos (ADB, 2002b). The project is located about 100 km upstream of the confluence with the rivers of Mekong and Theun on the border between Bolikhamxay and Khammouane Provinces and it affects about 2,500 people (see Figure 1) (ADB, 1999d). Its economic purpose is given as earning money for the Lao government, through export power sales to the Electricity Generating Authority of Thailand (EGAT), to use for national development (ADB, 2002b; ADB, 2000c; HDSS, 2000).

The ADB loaned US\$60 million from the Asian Development Fund (ADF) to the Lao People's Democratic Republic to implement the first joint-venture hydropower project with foreign investors (ADB, 2000b). The project is operated by the Theun-Hinboun Power Company (THPC) under a 30-year

³ The GMS includes Thailand, Cambodia, Lao PDR, Vietnam, Burma and the Yunnan Province of China.

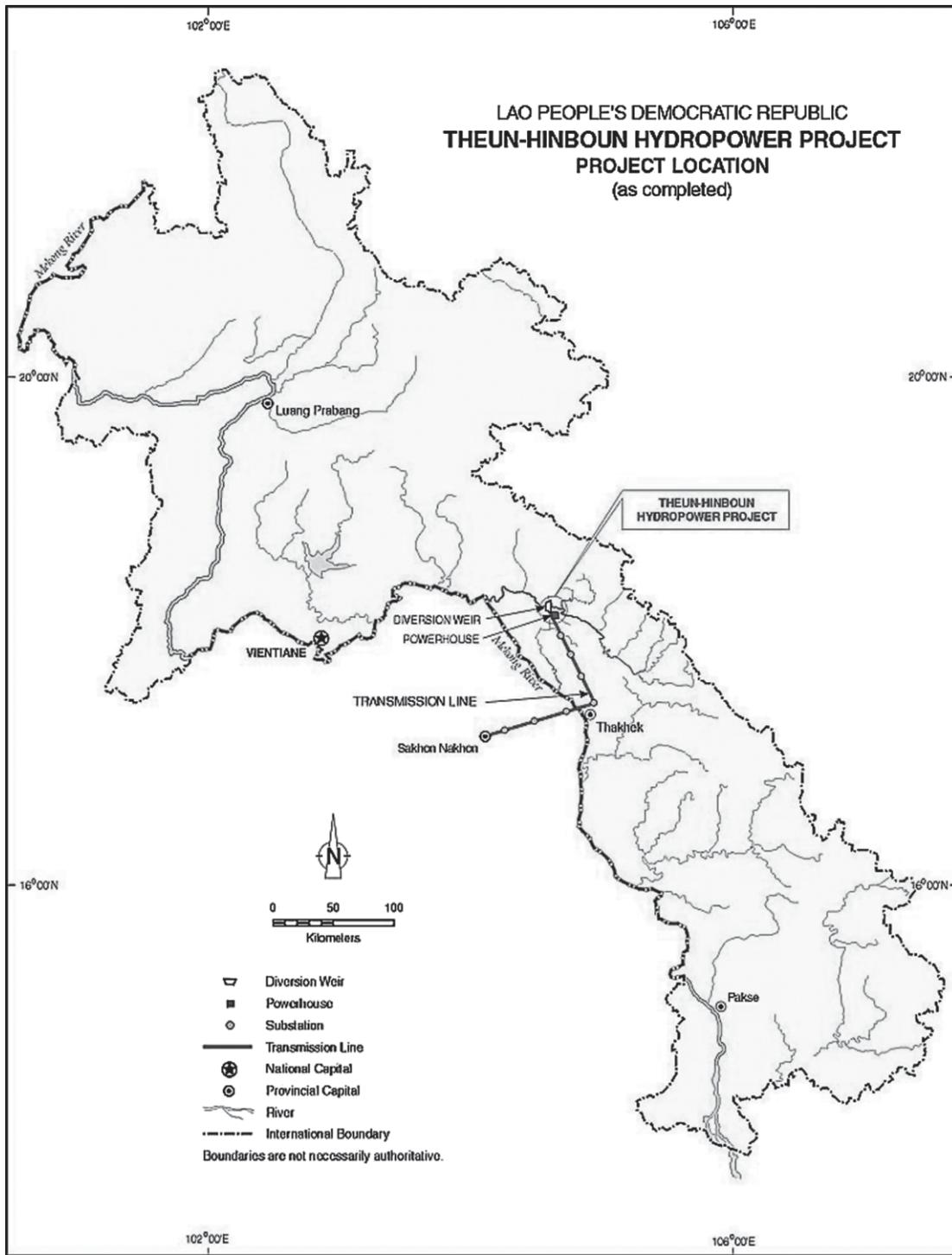


Fig. 1. The Theun-Hinboun Project location (ADB, 2000b).

BOT, a “build–operate–transfer” agreement (Shoemaker, 2000). Electricité du Laos⁴ (EdL) contributed 60% of the share capital, and two foreign investors, MDX Lao Public Company Limited and Nordic Hydropower AB, 20% each (ADB & SEI, 2002; THPC, no date). The project was completed on time in 1998 and below expected cost. An important consequence of the ADB involvement was the subjection of the project at each stage to scrutiny that ensured that it was soundly formulated, appraised and financed, thereby reducing the investment risks. Involvement of the ADB had a positive impact on capacity build-up in Laos in terms of exposure to new concepts and skill building (ADB, 2000c; personal communications 5, 6 and 7).

Even though the project has been described as privately financed, most of the financing is either public or publicly guaranteed. Consequently, the government of Laos (GoL) is exposed to a significant proportion of the commercial risk, while also being required to serve additional debt (see also Bakker, 1999; Cornford & Simon, 2001). While the ADB is supporting the private sector, it has been able to get the private sector to risk their capital for projects like the Theun-Hinboun only if the ADB provides subsidies, guarantees and other forms of safety nets for the private sector (Pahlman, 2000).

3.1. *Project impacts*

Many of the dams currently proposed and under construction are large, with similarly far reaching environmental and social impacts, like the Theun-Hinboun and the proposed Nam Theun 2 in Laos. Despite the successful implementation of the Theun-Hinboun Hydropower Project, it has been plagued with controversy and problems from its inception. Concerns were raised by several international NGOs⁵ during the project approval and implementation processes, over its poor decision-making process, inadequate environmental impact assessment (EIA) processes, conflicts of interest and potential for severe environmental and socio-economic impacts, which were downplayed or ignored by the project sponsors (see for example Shoemaker, 1998, 2000; Australian Mekong Resource Centre, 1999; FIVAS, 2003⁶; Probe International, 2001⁷). The environmental and social costs of the Theun-Hinboun were vaguely studied and downplayed by the promoters including the ADB. Studies were often carried out by consultants who had potential conflicts of interests. The EIA performed by Norconsult, a Norwegian consultant firm partly owned by one of project investors Statkraft, was insufficient and undermined the negative impacts of the dam in 1993. Two years later, the EIA prepared by Norplan did note adverse impacts on livelihoods of the project-affected people but it only became available after the construction was underway.

⁴ The EdL is a state-owned corporation under the Ministry for Industry and Handicraft and it owns and operates the country's main generation, transmission and distribution assets in the Lao PDR, and manages electricity imports into its grids and exports from its stations (EdL, 2002; HDSS, 2000).

⁵ For example the International Rivers Network (IRN), the International Union for Conservation of Nature and Natural Resources (IUCN) and Towards Ecological Recovery & Regional Alliances (TERRA) have criticized the Theun-Hinboun Project.

⁶ The Association for International Water and Forest Studies (FIVAS) is an independent organization working to obtain and disseminate information about the consequences of large dams and hydropower projects in the Third World, and to prevent Norwegian participation in projects with significant social or environmental impacts (<http://www.fivas.org/english/dumbdams.htm>).

⁷ <http://www.probeinternational.org/pi/documents/mekong/TheunHinboun2.html>.

At the time of the Theun-Hinboun's completion, the ADB was promoting it as environmentally friendly and a model for future hydropower development in the region (Shoemaker, 2002). But the project has caused various socio-economic and environmental physical impacts. People in the project-affected area have experienced flooding of vegetable gardens, reduced fish catches, loss of freshwater drinking sources and transportation difficulties since the project began operation. Although fisheries decline was one of the project's most significant impacts and significant declines in fish catches were predicted before the dam was built, no substantial fisheries studies were prepared prior to approval of the project, and the THPC has still not implemented fisheries mitigation activities (Blake, 2005). An improved road network and installed water and electricity supplies are the main positive impacts of the project (Shoemaker, 1998, 2000; Australian Mekong Resource Centre, 1999; THPC, 2002).

If an infrastructure project, such as the Theun-Hinboun, which was built as an instrument of national development, is beneficial, it should be so for all affected parties. Project-affected communities are entitled to receive full direct compensation for all of their livelihood losses including those from the loss of fisheries, other aquatic resources and agricultural land. But often costs including mitigation and compensation are minimized to maximize the rate of return on investment (Bakker, 1999). According to critics, as a consequence, development has often been sub-optimal, economic benefits have not been maximized, avoidable social and environmental damage have not been incurred and risks have not been fairly distributed (HDSS, 2000; see also ADB, 1999d; ADB, 2001a).

To remedy environmental and social impacts, a 10-year Mitigation and Compensation Program⁸ was agreed in 2000, and a new Environmental Management Division was formed within THPC in 2001 to implement it (ADB, 2000a; THPC, 2002). The plan includes various activities to develop the social and physical environment of the affected villages by improving agricultural management, food security and livelihood restoration, providing water supply, savings and credit funds, and health and sanitation services. Two primary strategies have been used for affected communities. Villages along the headpond, which flooded a considerable length of the Nam Theun/Kading River, were targeted for a gradual conversion from shifting cultivation to more permanent agricultural practices like agro-forestry, wet rice terracing, and horticultural production on irrigated plots. Lowland villages along the recipient Nam Hai and Hinboun rivers were offered irrigated vegetable plots and fruit trees on river levees, support for livestock rearing and intensive irrigated dry season rice cultivation, as the chief compensatory measures for loss of livelihoods from the decline in fisheries and riverbank garden production (ADB, 2000b; ADB, 2000c; Blake, 2005).

Despite international campaigns and pressure put on the ADB by civil society to resolve issues of compensation, it has been a long battle to obtain adequate compensation for the affected people. Moreover, as part of THPC's plan for compensation and mitigation, the company requires a third party review to be conducted every two years to examine the effectiveness of its programme and issue recommendations for improvement (Blake, 2005). Therefore, the International Rivers Network (IRN) and THPC signed a cooperation agreement jointly to develop a third party review to examine the programme. But the THPC ended cooperation three weeks after the month-long review began, based on concerns that the agreement did not follow standard corporate practices (IRN, 2004). This whole evaluation process raises questions about openness, transparency and the spending of the project revenues.

⁸ According to Article 4 of the Regulation on Implementing Environmental Assessment for Electricity Projects in Laos (2000), for electricity projects that were approved and/or completed before the effective date of the regulation in question, the project owner shall prepare and implement an environmental management plan (EMP) to prevent or mitigate any further damage caused by the project. According to this, the THPC will be responsible for the EMP.

The review panel found that the THPC's activities in establishing village savings and credit funds, installing wells for water supply, building toilets and distributing mosquito nets were going well. On the other hand, viability of irrigation was a major source of concern to the review panel. It felt that the strategy of promoting a high-input chemical fertilizer-based farming system among resource-poor farmers was risky and favoured the wealthier members of the community who could better afford the risks involved while excluding the poorest. Furthermore, this strategy has the potential to have an unintended negative impact on aquatic ecology by polluting surface and ground water, thus further degrading the very resource base on which the poorest sectors are most reliant (Blake, 2005).

Achievements in improving the livelihood of local people through the Mitigation and Compensation Plan of the THPC have been widely noticed, but the major issue of contention is still whether the programme will adequately compensate all affected local communities for their losses and its overall effectiveness in restoring livelihoods will remain in question for many years to come (see Shoemaker, 2000; IRN, 2004; Blake, 2005). And as Blake (2005) points out, it is important to keep in mind, however, that this mitigation programme is not an ordinary aid-driven rural development project to improve people's living conditions. Instead, this programme was created to mitigate the impact of an environmentally destructive project carried out without properly consulting the traditional users of the local natural resource base beforehand, and who have ultimately borne many direct and indirect costs and risks to their former river-based livelihoods.

One of the major outstanding problems of large-scale dams is also resettlement and rehabilitation of the affected people, who often represent poor and vulnerable ethnic minority groups. Resettlement typically involves not just physical relocation, but massive changes in social context, lifestyle and agricultural practices. In the case of the Theun-Hinboun, resettlement was assumed to be unnecessary. No involuntary resettlement was involved, but the project did cause relocation of local people owing to flooding and bank erosion problems along the headpond. The social impact was greatly underestimated both in scope and duration during the planning process. Consequently, mitigation and compensations plans, including resettlement plans as well as rural development plans did not meet the project-affected peoples' needs and priorities (ADB & SEI, 2002). The aim of the THPC's Mitigation and Compensation Program is to compensate the livelihood losses of these relocated and project-affected people.

The Lao government has also implemented its resettlement policy in the project area. Many international NGOs in Laos have criticized the resettlement policy of the Lao government for being badly designed and implemented (personal communication 1; Oxfam Community Aid Abroad, 1999). Congruent with the government's policy, new villages have been formed in the Theun-Hinboun project area combining smaller villagers into larger units, sometimes without cognizance of the diverse needs and wishes of different ethnic groups. Resettled groups have to some extent suffered from declining nutritional intake, rising sickness and mortality rates and loss of traditional cultural practices (personal communication 1). On the positive side, improved roads in the project area have improved villagers' access to markets with many households initiating trading ventures.

4. Compliance of the Theun-Hinboun with ADB policies

The World Commission on Dams (2000) has noted, "Social and environmental issues have historically been among the least addressed concerns in dam-related decision-making. . . they are two of the key issues that determine whether a dam proves to be an effective development project that enjoys

general acceptance by the public". The Theun-Hinboun hydropower project is no exception to this. The implementation of the project points to problems of accountability, transparency and environmental sustainability in implementing large-scale infrastructure projects in Laos. These experiences call into question the Lao government's institutional capacity and political will to ensure that infrastructure projects are adequately monitored, that compensation is fairly and fully distributed and that environmental issues are properly addressed.

The ADB requires that social and environmental aspects are included in its projects via several policies, strategies and procedures⁹ that ensure good governance, transparency and accountability within the institution and its operations. However, economic reasoning is inevitably embedded in the decision-making processes concerning infrastructure or natural resources utilization projects. The promotion of economic growth remains central to the ADBs' development philosophy as well to the World Bank even though the ADB has recently forcefully highlighted the poverty reduction objectives. Economic growth is considered not only complementary to social and environmental objectives, but the key strategy for their achievement.

At the time of the Theun-Hinboun project implementation many of the ADB Bank's guidelines were not effectively applied and implemented. Many critics, together with studies of the Theun-Hinboun project done by international NGOs and organizations (for example the IRN, Australian Mekong Research Centre, Oxfam Community Aid Abroad, World Commission on Dams (2000); Shoemaker (1998, 2000); Probe International, 2001; FIVAS, 2003) and several interviews with project stakeholders have revealed that the ADB shows a lack of competence in implementing its policies and guidelines. The ADB (personal communication 2) has excused the insufficient implementation of the project stating that the project was funded and constructed before the ADB had fully developed its policies on environmental and social issues. Secondly, no baseline data were available in Laos during the elaboration of the environmental impact assessment and the environmental investigation was left to local personnel with limited experience (ADB, 2000c).

There have been uncertainties regarding Theun-Hinboun project data and analyses of its social and environmental impacts have not been adequate. Clearly, there was also a conflict of interest with the first EIA done by Norconsult, a Norwegian consultant firm partly owned by one of project investors Statkraft, about which the ADB should have been notified. Consultation with local communities in the project area was not sufficient. Ethnic minorities and indigenous peoples have not been engaged in the development process even though the ADB's policy on Indigenous Peoples (ADB, 1999c) states that in development efforts that affect indigenous peoples, it is necessary that the bank integrates concern for indigenous peoples into each step of programming, project processing and policy development cycles.

The ADB's policy on fisheries (1997) states that the impact of bank's project on fisheries must be thoroughly assessed and eliminated or mitigated. The bank had not assessed the impact of the Theun-Hinboun on fisheries prior to the project although the project has had a considerable impact on fisheries and subsequently on the livelihoods of people who depend on them. A constricted fisheries study was made after the dam commenced operations and it left many issues obscure (Warren, 1999). A study on fisheries is now finally under preparation and it will shed some light on the impact caused to the fish population by the project.

⁹ Governance: Sound Development Management (ADB, 1999b); the Poverty Reduction Strategy (ADB, 1999a); Gender and Development (1998b), Policy on Indigenous Peoples (ADB, 1999c); Cooperation Between ADB and NGOs (1998a); and Involuntary Resettlement (1995; 2003c) are some of the most important ADB's policies, guidelines and instructions.

Identification of stakeholders and planning effective public consultation and participation activities is a key aspect of project evaluation and implementation and it is increasingly a condition of support by leading international development agencies. Although the ADB has emphasized the importance of the participation of civil society in formulating strategies and managing natural resources is stressed throughout the bank's water and energy policies, the bank has not been able sufficiently to identify and involve people affected by the Theun-Hinboun dam project in the consultation and participation process. And certainly villagers themselves in the Theun and Hinboun river basins have limited power to dispute with or oppose the government in its decision to expropriate the river for the production of hydro power (Usher & Ryder, 1997).

Recently, in an interim review of the Bank's Water policy¹⁰, the ADB's Water Sector Committee recommended a revision of the policy provision for large water resources projects by narrowing the scope of implementation of stakeholder justification agreement requirements, which may diminish the voice of local people even more. A serious commitment to participation seeks and achieves diverse stakeholder representation and involvement via genuine participatory processes that are safe, non-threatening, non-coercive, predictable and maintained over time (Dore, 2003b).

4.1. The impact on poverty reduction

Hydropower development has been seen as a major factor alleviating poverty in Laos. The Lao government promotes power generation in order to utilize hydropower revenues for social development and poverty alleviation projects. Of the Lao population, 26.3% lived below US\$1 per day in 2001 (UNDP, 2003; World Bank, 2004) and 39% of the people live under the poverty line based on food consumption of less than 2,100 kilocalories per person per day (National Statistical Centre, 2000). Poverty in Laos is "new poverty" not an endemic condition. Poverty is the result of events of external to the villagers, over which they have no control, especially, weather, war, resettlement and poorly implemented development programmes (Participatory Poverty Assessment, ADB, 2001c). But forms of development, like hydropower, commonly identified and pursued for economic growth at the national level are often quite different to those that are needed for quality growth at the local community level. Rapid national growth can often lead to undermining the real and sustainable development of communities. In particular, transition to a modernized market-based economy will increasingly marginalize the position of ethnic minorities and women within the economy, as the market approach undermines the value of their roles and livelihood practices (Oxfam Community Aid Abroad, 1999).

International relations and cooperation can play a supportive role in national development and poverty reduction objectives in Laos (Phomvihanh, 2003). Since the Poverty Reduction Strategy was adopted in November 1999, the ADB has promulgated its overarching goal of poverty reduction in the region (ADB, 1999a). The ADB's poverty focus itself is indicative of an organization attempting to adapt and survive (Dore, 2003a), but have the guidelines and policies of "poverty reduction" and "sustainable development" really been implemented at the project level itself?

¹⁰ The review noted that while the ADB should continue to pursue a cautious approach to projects involving dams, it is impractical to expect all stakeholders to agree on the justification for such projects. In the context of the ADB's new accountability mechanism, the proposed revision thus reads: "All such projects will need to be justified in the public interest, and stakeholders must be provided the opportunity to comment regarding the justification with their views considered. The ADB will promote the participation of government, civil society and other stakeholders towards this end." (ADB, 2004).

The Theun-Hinboun hydropower project has been considered to be a commercial success from the outset and will yield annual government revenues up to US\$30 million or more over the first decade of the new century (HDSS, 2000). Total net revenue from the Theun-Hinboun to the government and EdL was US\$23 million in year 2000, which is estimated to increase to about US\$29 million by year 2010 (ADB, 2003d). Earnings from the project would accrue to the Lao national budget, seen as the “main vehicle for the government to deliver social services and redistribute income” (ADB, 1994). But the proposed 1,080 MW Nam Theun 2 (NT2) has raised concerns about the economic viability of the Theun-Hinboun and thus poverty reduction objectives, because it would divert water from the Theun before it reaches the Theun-Hinboun facility and thus it would undercut the function and productivity¹¹ of the Theun-Hinboun by denying it water (White, 2001).

Concerning the use of project revenues, governmental expenditures in the social sector have overall increased from 59.2 billion kip in 1996/97 to around 756 billion kip in 2002/03 (ADB, 2003d). There were no earmarked revenues from the Theun-Hinboun for poverty reduction and the link between poverty alleviation and project revenues is ambiguous as well as the way that the revenues have actually been used in the social sector. According to some critics, these funds may have gone to a questionable government resettlement programme moving ethnic minorities in the lowlands (Interview I). According to the representatives of the ADB’s Mekong Department (personal communication 10) “. . .and indirect this [the revenues from Theun-Hinboun] will help the government to spend more for social sector interventions, education, health and maybe some poverty reduction programme. There was no one-to-one linkage between Theun-Hinboun revenue and poverty reduction activities. In the case of Nam Theun 2 that is now being planned, a certain amount of the revenues is earmarked for poverty reduction activities”. For example, the international NGO TERRA (personal communication 1) has criticized this issue by saying “They [investor, ADB] claim the poverty reduction as their legitimisation, and that is they take a lot of public subsidy through that. So this is what I. . . I mean the question is how they can prove that, or why they don’t try to prove that to the public”.

Multilateral development banks and most of the donors and NGOs agree that there is a need for a more transparent system for deciding how to use the revenue from the energy sector. With the substantial funds earned from THPC, EdL subsidizes electricity tariffs for the Lao people and supports its various power generation and distribution projects (ADB, 2000c). The way of spending the revenues in subsidizing the tariff for electricity consumers has been questioned (ADB, 2000a; personal communication 3). The most likely beneficiaries of the subsidy will be the richest part of the population, which is a big distortion of the government’s poverty eradication strategy and the ADB’s poverty reduction aims.

And on the other hand, doesn’t the emphasis on large-scale hydropower development again show the trend of concentrating public investment on the development of those areas that the poor cannot afford and which they don’t benefit from? Basic needs, like food security, access to health services, education, housing, clean water and sanitation should be satisfied first, and only then can access to modern forms of energy become important owing to beneficial direct and indirect impacts (ADB, 2000a; see also ADB, 2003b). Poor Laotian people need increased investment in upland agriculture, livestock and agroforestry/non-timber forest products in order to survive, mitigations where investment is currently negligible and which are not reaching the poor (ADB, 2001c).

¹¹ According to the ADB (2002b), in 2009 when the Nam Theun 2 project is expected to become operational, it was originally assumed that there would be a 275 GWh drop in the electricity generated in the Theun-Hinboun. But now the capacity of NT2 has increased almost by double, which will have a more extensive impact on water flow and the environment.

THPC's mitigation and compensation plan facilitates the project-affected villagers to some degree, but still it is highly questionable whether large hydropower development projects are the most appropriate way to alleviate poverty in Laos. As the government of Laos follows the export-led growth model of economic development espoused by its multilateral development bank advisers such as the ADB, the dilemma facing the government is that it sees no other industry, resource based or otherwise, in the short to medium term apart from hydropower, which will generate what it believes to be potentially large export revenues (Australian Mekong Resource Centre, 1999).

5. Lessons learned

Attention and criticism of large-scale infrastructure projects is often focused on the execution of environmental assessments, the consideration of externalities, the financial and political structures behind dam funding and the role of the MDBs and private companies (Hirsch & Cheong, 1996; FIVAS, 2003). The implementation of the Theun-Hinboun project shows that the traditional "economic growth-based" development model continues to be the foundation of the ADB's policies and operations, by downgrading social and environmental aspects.

The ADB should have been more efficient in quantifying and recognizing the impact of the Theun-Hinboun Project on local communities. Despite the fact that early environmental impact assessments (EIAs) for the project were publicly discredited and the EIA done by Norplan was published after the construction, the ADB chose to approve the loan anyway, allowing the project to proceed. EIA procedures should form an essential and integrated part of the planning procedures for a project and should consider the social as well as environmental impact including aspects of public participation. The ADB itself admits that in terms of the environmental and social impact of the Theun-Hinboun, implementation should not proceed without developing adequate baseline data and designing a comprehensive mitigation plan (ADB, 2002b, personal communication 2). The Theun-Hinboun was implemented without prior informed consent of the affected persons, and failed to assign responsibility or funds for full mitigation of the social and environmental effects. Lack of consultation with affected communities means that many villagers are suffering from unexpected impacts and are unaware of any procedures in place to deal with these impacts.

Generally, the different departments of Lao government and other stakeholders feel that if the project is funded by the ADB or the World Bank, environmental and social management of development interventions will be more effective and the rules and social/environmental guidelines will be followed (personal communications 4, 7 and 8). And as the ADB (personal communication 10) stated, "But what we've seen if we are not involved in the projects, many of the safeguard provisions are not built into a project in many countries. Therefore, the best protection for the poor is to be sure that the ADB or World Bank or both are involved in the project". Nowadays, the government and the MDBs are coming closer together on safeguard issues. Both the World Bank and the ADB have pushed Laos into sector-specific regulation of environmental and social issues in large-scale interventions in the energy sector (personal communication 9). With regard to the coming Nam Theun 2, a lot has evidently been learnt from previous experiences and issues like environmental impact and resettlement have been thought over and revised in project preparation (see ADB, 2001b).

In addition to the Bank's guidelines and safeguards, the ADB has recently created a cumulative impact assessment study (CIA) procedure better to manage and respond to difficulties encountered in large-scale

infrastructure projects. The CIA study includes spatial and temporal considerations, potential development scenarios, key issues and questions, and study of sector plans of different levels (ADB, 2003d; personal communication 9). The CIA will be prepared for the proposed Nam Theun 2 in Laos partly based on lessons learned from previous dam projects, considering social and environmental issues more carefully and extensively during the whole project process period. Still, some NGOs have criticized the new CIA policy of the ADB stating that it is only another procedure of the bank to hide its true agenda – the pursuit of economic growth (personal communication 1).

The problem of participation and information disclosure policies of international financial institutions (IFIs) is widely recognized and IFIs have been criticized for seeing participation as a simple, cosmetic and technical issue, whereas it is inevitably a political issue (see for example *World Development Movement, 2001; Guttal, 2002*). As a representative of the Mekong Department of the ADB (personal communication 10) stated, “One area where they think ADB is not doing enough is disclosure of information during project implementation. Before approval of the project a lot of information is now made available but once implementation has started it is very hard to find information about what is happening”. Clear information has not been made available to communities as a whole and individuals are at the bottom of a very top down process of decision making. The ADB and the THPC must commit to a vastly improved process of information sharing and transparency regarding the Theun-Hinboun project and to developing mechanisms for input from local people and concerned citizen groups within and outside of the country (Shoemaker, 2001). Improved standards for regular and timely information sharing, external independent monitoring of compensation implementation processes and provision of local input need to be strengthened.

The objective of the Theun-Hinboun hydropower project is to support economic growth, by enhancing foreign exchange earnings, and to reduce poverty. The project’s macroeconomic impact itself has been substantial and it has enabled the Lao government to improve capacity building and technology transfer in the sector (ADB, 2002b; personal communication 4). But reviewing the Theun-Hinboun project for consistency with the ADB’s poverty reduction strategy shows that there is a blurred link between the project revenues and poverty reduction activities. There needs to be more clear evidence that the project revenues should be used for social expenditure allocation in the national budget and poverty reduction activities (ADB, 2002b). For future projects, the income distribution effects of royalties, dividends and taxes accruing to the government from hydropower plants needs be analysed from a social perspective, including poverty reduction impact (ADB, 2000c). In general, Laos needs to take additional revenue measures and reallocate expenditures to increase recurrent expenditure in the social sectors (World Bank, 2004).

There is no question whether there will be a need to continued foreign assistance in the short to medium term to achieve a sustainable and equitable regime of natural resource management in Laos. Assistance should, importantly, be in the area of human resource development in planning and implementation of natural resource management programmes. While there are strong pressures to develop large-scale projects such as in current proposed dam schemes, aid money should instead look towards more environmentally benign and socially more equitable small to medium scale projects (Cheong, 1998). In the field of hydropower development projects, several interviews with stakeholders, including representatives of GoL, THPC, MDBs and international NGOs in Laos emphasized that more consideration needs to be given to the social and environmental impact, and the project developer should use more money in mitigation of the project impacts at the beginning of the project. The importance of

developing a comprehensive hydropower development plan, collaboration and coordination with different sectors, sharing of experience and learning together were also highlighted.

6. Conclusions

Development of infrastructure is one of the major requirements of the expansive economic development plans for Laos as proposed by the multilateral development banks as well as the Lao National Government. Until recently, dominant views have tended to favour large-scale interventions and large dams, but the negative social and environmental impact has called into question the effectiveness and profitability of large-scale development projects. The implementation of the hydropower projects addresses major problems with transparency, accountability and environmental sustainability in implementing large-scale infrastructure projects. Because of the mistakes made in hydropower development projects previously, it is highly relevant to analyse the implementation and decision-making process in relation to various stakeholder interests, environmental and social impacts in order to avoid similar mistakes.

Good governance has become the key word for most processes within international dialogue and development interventions both in official development agencies and non-governmental development communities. Because the development strategies and policies of the MDBs have significant impact on the management of the environment and natural resources, the governance and decision-making system of financial organizations needs to be more open and transparent, and their policies and decisions should be more openly and carefully reviewed. Good governance can be enhanced by institutionalizing participation at project, district, provincial and national level including improving inter-agency coordination. An institutional mechanism that ensures revenue from export of hydropower is actually used for poverty alleviation is needed.

Despite the fact that many large infrastructure projects have shown that it is possible to achieve levels of economic growth through large-scale hydropower development, like the Theun-Hinboun hydropower project, this growth is often neither equitable nor sustainable in the longer term. Economic benefits have usually not trickled down in the expected manner to the local communities of the project-affected area. The impact of large infrastructure projects on poverty reduction is often blurred, so that in-depth assessments would be required to establish the effectiveness with which project earnings are being put to use for national development and poverty reduction. The success of the Theun-Hinboun project cannot be taken as a broadly applicable indicator that hydropower projects are beneficial in the region. The physical parameters of every project are different and they must be evaluated on an individual basis (White, 2001). The economic viability of numerous small hydro projects has to take into account needs to be assessed and better planning and site studies are also needed (World Bank, 2004).

The social and environmental safeguards of the MDBs will enhance the implementation processes of many developmental projects in developing countries, which lack human, technical and financial resources. Institutions like the World Bank and the ADB must embrace greater transparency and participation both at the project level and in their internal decision-making practices, which are to some degree hidden from public. Cooperation between the banks and NGOs can offer an invaluable combination of experiences and perspectives, especially concerning the poor and most vulnerable social groups. Additionally, the MDBs should take cognizance of the WCD recommendations more carefully in order to follow current international best practice standards for water and energy development planning.

References

- ADB (1994). Report and recommendation of the President to the Board of Directors on a proposed loan to the Lao People's Democratic Republic for the Theun-Hinboun Hydropower Project. Asian Development Bank, Manila, Philippines.
- ADB (1995). *Involuntary Resettlement*, Asian Development Bank, Manila, Philippines.
- ADB (1997). *The Bank's Policy on Fisheries*, Asian Development Bank, Manila, Philippines.
- ADB (1998a). *Cooperation Between ADB and NGOs*, Asian Development Bank, Manila, Philippines.
- ADB (1998b). *Gender and Development*, Asian Development Bank, Manila, Philippines.
- ADB (1999a). *Fighting Poverty in Asia and the Pacific: The Poverty Reduction Strategy*, Asian Development Bank, Manila, Philippines.
- ADB (1999b). *Governance: Sound Development Management*, Asian Development Bank, Manila, Philippines.
- ADB (1999c). *Policy on Indigenous Peoples*, Asian Development Bank, Manila, Philippines.
- ADB (1999d). *Special Evaluation Study on the Social and Environmental Impacts of Selected Hydropower Projects*, Asian Development Bank, Manila, Philippines.
- ADB (2000a). *Energy 2000. Review of the Energy Policy of the Asian Development Bank*, Asian Development Bank, Manila, Philippines.
- ADB (2000b). *The Greater Mekong Subregion Economic Cooperation Program. GMS Assistance Plan (2001–2003)*, Asian Development Bank, Manila, Philippines.
- ADB (2000c). *Project Completion Report on the Theun-Hinboun Hydropower Project (Loan 1329 – LAO [SF]) in the Lao People's Democratic Republic*, Asian Development Bank, Manila, Philippines.
- ADB (2001a). *Power Sector Strategy Study. Draft Final Report*. ADB-TA 3374-LAO. Asian Development Bank, Manila, Philippines. Online at: <http://www.poweringprogress.org/lao-energy/policies/pss.htm>.
- ADB (2001b). *Workshop to Discuss the World Commission on Dams Report Dams and Development. Reality Check of the WCD Guidelines. A Case Study for the Nam Theun 2 Hydro-Electric Project in Lao PDR*, 19–20 February 2001, Asian Development Bank, Manila, Philippines.
- ADB (2001c). *Participatory Poverty Assessment*, State Planning Committee & National Statistics Center, Asian Development Bank, Vientiane.
- ADB (2002a). *Building on Success: A Strategic Framework for the Next Ten Years of the Greater Mekong Sub-region Economic Co-operation Project*, Asian Development Bank, Manila, Philippines.
- ADB (2002b). *Project Performance Report on the Theun-Hinboun Hydropower Project (Loan 1329 – LAO [SF]) in the Lao People's Democratic Republic*, Asian Development Bank, Manila, Philippines.
- ADB (2003a). *Country Strategy and Program Update (2004–2006), Lao People's Democratic Republic*, Asian Development Bank, Manila, Philippines.
- ADB (2003b). *Assessing the Impact of Transport and Energy Infrastructure on Poverty Reduction* (ADB – TA No. 5947-REG). Draft Final Report. Asian Development Bank Online at: http://www.adb.org/Documents/Events/2001/RETA5947/draft_final_report.pdf.
- ADB (2003c). *Involuntary Resettlement, Operations Manual. Bank Policies*, Asian Development Bank, Manila, Philippines.
- ADB (2003d). *Lao PDR Power Sector Strategy Study. Final Report Volume I*. ADB TA 3374-Lao. Asian Development Bank, Manila, Philippines.
- ADB (2004). *Interim Review of ADB's Water Policy Implementation*, Asian Development Bank, Manila, Philippines.
- ADB & SEI (2002). *Strategic Environmental Framework for the Greater Mekong Subregion: Integrating Development and Environment in the Transport and Water Resource Sectors*. Volume IV: SEF Case Study Reports. Asian Development Bank and Stockholm Environment Institute.
- ADB & UNEP (2004). *Greater Mekong Subregion Atlas of the Environment*, Asian Development Bank & United Nations Environment Programme.
- Australian Mekong Research Centre (AMRC) (1999). Australian Mekong Research Centre. Online at: <http://www.mekong.es.usyd.edu.au/>.
- Bakker, K. (1999). The politics of hydropower: developing the Mekong. *Political Geography*, 18(2), 209–232.
- Blake, D. (2005). Future in Doubt. Reviewing Dam Builder's Efforts to Restore River-based Livelihoods in Laos. *World Rivers Review*, 20 (1 February 2005), 6, 7, 15. Online at: <http://www.irn.org/pubs/wrr/issues/WRR.V20.N1.pdf>.
- Cheong, G. (1998). *Resource Management in the Lao Mekong Basin*. Working Paper No. 73. National Library of Australia.

- Cornford, J. & Simon, M. (2001). *Breaking the Banks. The Impact of the Asian Development Bank and Australia's Role in the Mekong Region*, Oxfam Community Aid Abroad, Australia.
- Dethrasavong, C. (2003). *Advancing Environmental Governance. Perspectives from the Regional Environmental Forum for the Mainland South East Asia*. A Perspective on Laos. Online at: http://www.dec.org/pdf_docs/PNACS988.pdf.
- Dore, J. (2003a). Environmental governance in the Greater Mekong Sub-Region. In: *World Resources Institute. Mekong Regional Environmental Governance: Perspectives on Opportunities and Challenges*, Compilation Volume. Online at: http://pdf.wri.org/mekong_governance_mreg_dore.pdf.
- Dore, J. (2003b). The governance of increasing Mekong regionalism. *Regional Centre for Social and Sustainable Development (RCSD) Conference, Politics of the Commons*, 11–14 July.
- EdL (2002). *Annual Report 2002*. Electricité du Laos, Vientiane.
- FIVAS (2003). online at: <http://www.fivas.org/english/dumbdams.htm>.
- Freeman, N. (2001). *The Challenges Posed by Globalization for Economic Liberalization in Two Asian Countries: Laos and Vietnam*. Discussion Paper No. 2001/40. United Nations University, World Institute for Development Economic Research. Online at: <http://www.wider.unu.edu/publications/dps/dp2001-40.pdf>.
- Guttal, S. (2002). *Disclosure or Deception? Multilateral Development Banks and Access to Information*. Focus on the Global South. Online at: <http://www.freedominfo.org/ifti/guttal.htm>.
- HDSS (2000). *Hydropower Strategy Final Report*. Volume A, Hydropower Development Strategy Study, Worley-Lahmyer, World Bank.
- Hirsch, P. & Cheong, G. (1996). *Natural Resource Management in the Mekong River Basin: Perspectives for Australian Development Cooperation*. Final Overview Report to AusAID, University of Sydney. Online at <http://www.usyd.edu.au/su/geography/hirsch/index.htm>.
- IRN (2004). *The Legacy of Hydro in Laos*. International Rivers Network, Online at: <http://www.irn.org>.
- Lao PDR (2000). *Regulation on Implementing Environmental Assessment for Electricity Projects in Lao PDR*. Lao People's Democratic Republic, Ministry of Industry and Handicrafts.
- Lao PDR (2003). *National Poverty Eradication Programme 2003*. Eight Round Table Meeting, Lao People's Democratic Republic, Vientiane. Online at: <http://www.undplao.org/Round%20Table%20Process.htm>.
- Le-Huu, T. & Nguyen-Duc, L. (2001–2003). *Mekong Case Study*. In cooperation with Anukularmphai, A., Hong Phan, D., Phonekeo, K., Sokhem, P. & Hai-Lun, Z. Water Resources Section, Division of Environment and Sustainable Development. The article was prepared within UN-ESCAP "From Potential Conflict to Cooperation Potential (PCCP): Water for Peace.
- Mathur, V., Sitrith, M. & Öjendal, M. (2001). *Assessing Environmental Governance in the Lower Mekong River Basin: A Study of the Hydropower Site Selection Process in the Se San and Sre Pok Basins*. Online at: http://pdf.wri.org/mekong_governance_mreg_mathursitrithojendal.pdf.
- Mehta, L. (2000). Rethinking key assumptions in natural resources management: Drawing lessons from the case of water. First and provisional draft. Paper for the Panel on "Institutions and Uncertainty", at the *8th Biennial Conference of the International Association for the Study of the Common Property*. Bloomington, Indiana. May–June 2000.
- National Statistical Centre (2000). *Basic Statistics on Socio-Economic Development in Lao PDR*. GoL, Vientiane.
- Öjendal, J. (2000). *Sharing the Good: Modes of Managing Water Resources in the Lower Mekong River Basin*. Dissertation at Department of Peace and Development Research. Göteborg University, Sweden. Vasastadens Bokbinderi AB, Göteborg.
- Oxfam Community Aid Abroad (1999). *Dangerous Liaisons. Australia and the Asian Development Bank (ADB) in the Mekong Region*. Briefing Paper No. 24. Online at <http://www.caa.org.au/publications/briefing/adb/index.html>.
- Pahlman, C. (2000). *The Politics of Studies (and Economic Fairy Tales) – The Role of the ADB in Hydro-Power Development in the Mekong Region*. Paper for Mekong/ADB Symposium – Tokyo September 2000.
- Phomvihanh, S. (2003). Economic reform in Lao PDR: opportunities & challenges. *NERI's Economic Review*, 3(1), 5–11. Probe International. Online at: <http://www.probeinternational.org/pi/documents/mekong/TheunHinboun2.html>.
- Ryder, G. (2004). Behind the Mekong power grid: ADB master plan serves power monopolists not the powerless. *Watershed*, 9 (2 November 2003 – March 2004), 25–30.
- Shoemaker, B. (1998). *Trouble on the Theun-Hinboun. A Field Report on the Socio-Economic and Environmental Effects of the Nam Theun-Hinboun Hydropower Project in Laos*. International Rivers Network. Online at: <http://irn.org/programs/mekong/threport.html>.
- Shoemaker, B. (2000). A review of the Theun-Hinboun Power Company's Mitigation and Compensation Program. *International River Networks*. Online at: <http://www.irn.org/programs/mekong/001219.ntupdate.html>.

- Shoemaker, B. (2001). *Letter to Asian Development Bank Executive Directors*. Online at: <http://www.irn.org/programs/mekong/theun.asp?id=010510.adbletter.html>.
- Shoemaker, B. (2002). Environmental impacts and human rights in Laos – The Nam Theun 2 Hydropower Project. *Congressional Briefings on Nam Theun 2*. Online at: <http://www.irn.org/programs/mekong/namtheun.asp?id=020522.bsbriefing.html>.
- THPC (2002). *Logical Framework: 2001–2006 to Implement the 10-year Mitigation and Compensation Plan of Theun Hinboun Power Company Limited*, Theun Hinboun Power Company.
- THPC (no date). *A Leader in IPP Hydropower Development in Lao PDR*. Undated brochure. Theun-Hinboun Power Company.
- UNDP (2003). *Millennium Development Goals: A Compact Among Nations to End Human Poverty*. Human Development Report 2003. United Nations Development Programme. Oxford University Press.
- Usher, A. & Ryder, G. (1997). *Vattenfall Abroad. Damming the Theun River in Dams as Aid. A Political Anatomy of Nordic Development Thinking*, In *Routledge Studies in Development and Society*, Usher, A. (Ed.). T.J. International Ltd., Pastow, Cornwall.
- Warren, T. (1999). *A Monitoring Study to Assess the Localized Impacts Created by the Nam Theun-Hinboun Hydro-scheme on Fisheries and Fish Populations*. Final report prepared for the Theun-Hinboun Power Company.
- World Bank (2004). *Summary Overview. Lao PDR Country Economic Memorandum: Realizing the Development Potential of Lao PDR*. East Asia and Pacific Region, World Bank.
- World Commission on Dams (2000). *Dams and Development: A New Framework for Decision-Making*, World Commission on Dams, Earthscan Publications, London and Sterling.
- White, W. (2001). *Theun-Hinboun: An Assessment of Early Project Performance*. Prepared for Probe International. Online at: <http://www.probeinternational.org/pi/documents/mekong/TheunHinboun2.html>.
- World Development Movement (2001). Online at: <http://www.wdm.org.uk/>.
- WRI (2001). *Public Participation in Development Projects in Lao PDR*. Environmental Institute. Science and Technology and Environment Institute. World Resources Institute. The Mekong Regional Environmental Governance (MREG) Project. Online at: http://pdf.wri.org/mekong_governance_mreg_eri.pdf.

Appendix 1

Personal Communication:

1. UNDP, FAO, WWF, Concern Worldwide, Care International, IUCN, TERRA, Focus on Global South and Gender Resource Information, Development Centre of Lao Women's Union, The Embassy of Finland in Bangkok
2. Deputy Head of the ADB Lao PDR Resident Mission
3. Consultant of Energy and Mining Division of the World Bank
4. General Manager of Theun-Hinboun Power Company Ltd
5. Managers of the Environmental Management Division of Theun-Hinboun Power Company
6. Electricite du Laos, System Planning Office
7. Director General of STEA (Science, Technology and Environment Agency), Department of Environment
8. Environmental Specialist and Deputy Chief of Social and Environmental Management Division of Ministry of Industry and Handicrafts, Department of Electricity, Hydropower Office. Deputy Director General of Committee for Planning and Cooperation/Department for Promotion and Management of Domestic and Foreign Investment
9. Resident Director of Nordic Hydropower AB, Senior Environmental Planner and Environmental Coordinator of Norplan, Consultant of ECOLAO
10. Principal Project Specialist, Principal Operations Specialist and Deputy Director General of ADB's Mekong Department were interviewed in Manila, March, 2004.

Appendix 2

During the field study mission 32 interviews were held. The following presents the main questions presented to interviewees.

I. Interview questions for the MDB (World Bank, ADB Resident Mission in Laos, ADB HQ in Manila, UNDP)

- Please describe your work and responsibilities?
- Can you describe the projects of the Bank/organization, and safeguard policies in Laos?
- Can you describe the organization's goals in Laos and compare them with the government goals?
- What was the impact of Asian economic crisis here?
- How do you feel about free market type of economy in Laos?
- Could you describe your cooperation with the Lao government?
- Governance issues in general? Do you have capacity building programmes?
- Can you tell about cooperation with NGOS?
- Do you have some kind of cooperation with donor countries?
- What about public participation? What is the government attitude towards participation?
- Can you talk about BOOT projects like Theun-Hinboun?
- With Theun-Hinboun, there was quite a lot of criticism towards this project. What do you think you have learned?
- How do you see in general the role of hydropower in Laos?
- What is the ADB's/World Bank's stand on WCD?
- Has the ADB/World Bank considered any alternatives for hydropower in generating export earnings?
- What about GMS program, what is its' impact in Laos? Do you have some kind of coordinating role in the GMS?
- Do you think the government has enough capacity to evaluate the impacts of large-scale infrastructure projects?
- How do you think ethnic minorities are in general taken into consideration?
- Do you think you have enough baseline data for evaluation of projects?
- How do you see the relationship between poverty reduction and large-scale infrastructure projects?
- What do you think are the main environmental concerns here in Laos?
- How would you describe Theun-Hinboun project? In economic terms?
(ADB HQ)
- Describe ADB activities in the Mekong Region, planning and implementation of programme activities? What are the main sectors that the ADB is currently supporting in the Mekong countries?
- How has the GMS affected by economic crisis?
- What is the importance of "free market" type of economic growth to development of Mekong region/Laos?
- Can you tell something about the process of setting programme priorities/activities?
- Is ADB involved in MRC in any way?
- What is the emphasis on good governance issues?

- Can you describe the relationship between poverty reduction, private sector development and good governance policies of the ADB?
- How would you describe the influence of economic reforms on good governance?
- Can you describe the relationship between good governance and structural adjustment measures?
- Could you comment on the ADB's policy of information disclosure and its accountability to ordinary people both in the donor and DMCs?
- How is the ADB assessing its' own governance, accountability and internal decision-making processes for projects and programmes?
- Have you had many cases and complaints done by project-affected persons?
- Can you describe the relationship between poverty reduction and infrastructure projects, like hydropower?
- How do you find the revenues from the Theun-Hinboun and the impacts to poverty reduction?
- How do you see the relationship between large-scale infrastructure projects and environmental issues? And what is the ADB's view on 'environmental governance'?
- How is the struggle between World Bank and ADB affecting poverty reduction strategies?
- Can you talk about the role of private sector development, and the importance of BOT?
- ADB has now this new guideline of CIA cumulative impact study that you are using in NT2. Can you say something about that?
- What is the impact of NT2 on TH?
- Is the ADB following the guidelines and regulations of WCD?
- How are you able to combine the large-scale infrastructure projects and issues of environmental protection?
- Who are the participants in the round table process?
- What is the process of setting of program priorities?
- What are current trends in democratic governance?
- What is the importance of development aid and foreign direct investment for Laos?
- Can you tell us something about the relationship between the poverty reduction policy and the energy policy? Are there any gaps or inconsistencies between these policies?
- So, what is the main reason for the delay on NT II project?
- How do you see the position of Laos in NT II negotiations?
- Do you think NT II has affected future plans for hydropower development in Laos?
- How does your organization see the importance of private sector development?
- How do you see "build-own-operate-transfer" type of projects? What are their main benefits and drawbacks?
- Has there been any discussion in Laos about energy production alternatives?

II. Interview questions for International NGOs and Organizations (Concern, WWF, Care International, Eco-Lao, FAO, IUCN, TERRA, Focus on Global South, Midas Agronomics Co, UNIDO-Integrated Programme for Industrial Development, Finnish Embassy in Bangkok)

- Please describe your work and responsibilities?
- Regarding activities of your organization in Lao PDR, what are the main sectors that you are supporting?

- What cooperation is there between the government and other international NGOs, and multilateral development banks?
- What is the approach of your organization to large dams? Does your organization have any official approach to large-scale dams? Are you against them or do you think they alleviate poverty?
- What are your perspectives about involvement of multilateral aid agencies such as the ADB and World Bank in Laos especially in large-scale infrastructure projects?
- Can you describe the progress of achievement of Millennium Development Goals in Laos?
- What government resources are available for improvement of rural development?
- What is the involvement of your organization in the Theun-Hinboun Hydroelectric project?
- What is the resettlement policy?
- Participation? How do you, in practice, organize participation?
- How do you find the level of public participation and consultation in hydropower development projects?
- What is your cooperation with Lao groups like LWU?
- How do you feel about the proposed Nam Theun II dam?
- How do you see that the building of dams can be viewed as “poverty alleviation”? Do local people benefit from the building of large-scale dams?
- What is the relation between hydropower and protected areas?
- How do you find the role of WCD, do you think they have somehow influenced the design of hydropower projects in the Mekong Region or in Laos?
- What do you think would be alternatives for hydropower in Laos?
- What do you think generally about Laos’ position as a seller of electricity, or an exporter of electricity?
- How have you found working with the Lao government?
- How do find the role of the MRC?

III. Interview questions for the Lao Government (STEA—Department of Environment, Ministry of Industry and Handicrafts, Department of Electricity (Hydropower Office), Committee for Planning and Cooperation/Department for Promotion and Management of Domestic and Foreign Investment, Electricite du Laos, System Planning Office, Prime Minister’s Office: Water Resources Coordination Committee, Lao Women’s Union: Gender Resource Information and Development Centre, National University of Laos: Department of Forestry, LNMC—Lao National Mekong Committee)

- What does your work mainly involve at your division?
- Could you tell a little bit about the background of your department? If you think back when it was established, how has your work changed and what are the main issues you have been involved with?
- How do you find your resources?
- What is your cooperation with other ministries and international NGOs working in Laos?
- What is the quality of EIAs? Do you usually have enough information to make evaluations, or do you often need more studies?
- Do you do most of these evaluations yourself or do you use outside consultants?
- Does STEA also monitor the implementation of infrastructure projects?
- If there are some problems in the implementation of environmental issues, what kind of sanctions can you use?

- How do you see the role of multilateral development banks, like ADB and World Bank in environmental assessment process? What is their contribution?
- The role of WCD? Are you following their guidelines?
- Are you preparing SIA, for which projects do you do this?
- What are the main social concerns, for example with the NT II project? In general, what do you think about the large hydropower projects?
- What is the resettlement and compensation policy of Lao Government?
- Environmental administration in the provincial and district level, how is it organized there?
- How do you find the resources of the district level and the provincial level?
- Do you get any support outside, donors?
- Do you have awareness-raising projects within other ministries?
- Do you have some kind of environmental education at schools?
- Do you have any guidelines on public involvement in development projects? How is this usually done in practice?
- How do you find the linkages between hydropower and protected areas? How can you combine these two?
- How do you collect the data, for example, for the IEE? Are there people at the project site collecting the data? Where do you base your plans?
- How do you choose the projects that you are going to develop?
- Have there been any problems with the fact that the project owner also does the assessments? Is there ever any conflict of interest?
- In general, do you think BOT schemes are good in a country like Laos?
- What do you think are the main benefits of the BOT?
- Are there any risks regarding the BOT mechanism?
- How do you see the capacity of Lao government to negotiate BOT contracts and new investments?
- Have you done much of training of Lao people?
- In general, how do you see the role of hydropower in national development in Laos?
- How important is direct foreign investment for Laos?
- What kind of incentives is Laos offering for the investors?
- Do you see any risks in FDI and involvement with the foreign trade?
- How do you find the role of multilateral development banks? Are ADB and World Bank very crucial to the FDI here?
- Are investors at the moment interested in hydropower?
- How do you find the ADB's GMS program, what is its importance for Laos?
- Have you found any illegal activities like wildlife trade or logging, trade of timber?
- Are there any rural electrification projects?
- Have you considered any alternatives to hydropower, like solar energy?
- If you think about these hydropower projects, how much do you think the involvement of ADB or World Bank has influenced the projects?
- Do you think there are any differences in the ADB's approach to these development issues and in the government's approach? In general or with the environmental issues?
- How are you linking hydropower development plans and protected areas?
- How do you find ADB's role in the Theun-Hinboun project?
- After 30 years, when the government takes over the company, what will be your role then?

- What about mitigation and compensation process, have you participated in it?
- Do you think the involvement of Nordic companies has affected to the quality of implementation of the Theun-Hinboun project somehow (for example, consideration of environmental and social issues)?
- Did you have some demands on environmental and social issues or were they more along the ADB guidelines?
- How do you see Laos' political and economic environment in terms of FDI? Is it easy to operate here?
- Can you describe the PPA with the buyer EGAT?
- Has the Theun-Hinboun produced the amount of electricity that it was forecasted to do?
- What do you think are the main reasons for the successfulness of the project, sometimes it seems that hydropower projects have problems reaching the targets?
- Are there any downsides to the project?
- Can you describe the use of Cumulative Impact Study (CIA) and strategic impact analysis in hydropower projects?
- What do you think are the main pressures on water resources? What kind of different user groups are there?
- Can you describe IWRM? What does it include, what kinds of issues are included?
- How do you find the role of hydropower in water resources management in Laos?
- How well do you think different uses of water can be combined? Like hydropower, domestic use of water, irrigation?
- Do you think that there are constraints and difficulties affecting water resources management?
- What about data collection, do you have some kind of training for people who are responsible for collecting data? How is it implemented?
- In which areas do you have most difficulties? What about information on river environment or ecology, do you have enough of that?
- When you are preparing plans, for example, for the Nam Ngum Region, do you use some kind of participation or consultations with people? Do you think it is difficult to organise participation (many different languages)?
- Do you have some kind of training at the local level? Like environmental awareness raising programmes?
- Have you done any research or data collection on trans-boundary environmental issues?
- Do you get any support from the outside? Are any donors supporting you?
- How do you see future development of water resources in Laos? What are the main problems?
- What do you think other riparian countries think about water resource management in Laos? Are they satisfied?

IV. Interview questions for the Theun-Hinboun Power Company, TH Environmental Management Division, Nordic Hydropower AB, Norplan

- What is the background of the company? For how long have you been working here?
- Can you tell something about the cooperation with different stakeholders like EdL?
- What is the current role of the ADB in Theun-Hinboun, or is there any role at the moment?
- Could you describe what do you think about BOT schemes; how do they work in Lao PDR? What are their main benefits?

- What do you think about Laos' position when they are selling electricity?
- How do you feel about the proposed Nam Theun II dam? Wouldn't that affect the profits of Theun-Hinboun?
- What are the environmental and social impacts of the Theun-Hinboun?
- Can you describe the compensation and mitigation plan of the Theun-Hinboun Project?
- Could you describe the main livelihoods of the people in the project-affected area before the dam and now after the dam?
- What are the lessons learned?
- If you think about it from the point of view of government, do you think there are any lessons to be learnt for them from this project?
- Could you describe generally the overall impact of whole Theun-Hinboun project? What is your view on the whole project and the planning stages? How successful has it been?
- When you started the project, did you have any baseline data, for example on social conditions or livelihood studies done by the government?
- What about services in this area before the project? Did the government provide any social/extension services?
- What about small credit and savings funds. There are some in some villages. How wide is this organization?
- Do you have any cooperation with other development projects in the project area, or are there any others?
- Are there any other activities included in this alternative income generation?
- Could you describe compensation issues? How do you, for example, evaluate the value of compensation for fisheries or river gardens?
- The Mitigation and Compensation Plan will operate for ten years, what after that?
- Are there any linkages with this plan and the government development strategies for the project district, or other strategies?
- If local people are not satisfied with compensation and mitigation processes, where can they argue their case?
- If you think back on this whole process, did the World Commission on Dams affect your work in any way?
- Do you think the government will be able to use the experience of the mitigation and compensation plan in their work, in their rural development plans?

DOI: 10.1108/eb045852

Irrigation management transfer in Lao PDR: Prospects and Issues

Jusi, Sari & Virtanen, Maarit

Ph.D. Candidates, Department of Regional Studies, University of Tampere, Finland

E-mail: sari.jusi@uta.fi

E-mail: maarit.virtanen@uta.fi

Abstract

Water resources development plays a central role in reducing poverty and achieving sustainable economic growth in Laos. The development of irrigation is vital for the rural population dependent on agricultural production, but irrigation projects have suffered from low levels of maintenance, as farmers have felt little ownership for the government projects. At the moment, a process of Irrigation Management Transfer (IMT) is undertaken in Laos with the aim of transferring the management and operation of schemes to farmers. This article aims at evaluating, how IMT has been implemented in Laos and how it is affecting the sustainability of agriculture.

1 Introduction

The water sector is a key for the development strategy of Lao People's Democratic Republic (referred to as Laos in this text), because of the importance of agriculture in terms of both income and employment generation, and the competitive advantage of Lao hydropower in the region. Optimal use of water resources is a critical factor in realizing government's dual strategic objectives of poverty reduction and sustainable economic growth (ADB, 2004a). About 85 per cent of population live in rural areas and 95 per cent of them depend on income from agricultural production and live on subsistence farming, mainly rice (ADB, 2000; ADB, 2002). The government has given high priority to investments in the irrigation sub-sector. However, the water resource development is still at a low level: irrigated area is only 20 per cent of the

national paddy area and hydropower production is still at 2 per cent of its potential. (ADB, 2004a).

Since Lao government's development strategy emphasizes poverty reduction and economic growth through improved management of water resources, integrated water resources management (IWRM) is necessary to reinforce links and synergies between water and land use, environment, and sustainable development (ADB, 2002). The concept of IWRM can be defined as a process that promotes the coordinated development and management of water, land and related resources in order to maximize the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems (GWP, 2003; Van Hofwegen, 2000). In the past few years the government has introduced various legislative and institutional measures to manage water resources more effectively and efficiently. The government has recognized the need for coordination and therefore has established the Water Resources Coordination Committee (WRCC, 2004).

In Laos, the use of irrigation expanded rapidly over the 1990s, with the government reporting an eight-fold increase in irrigated rice area during this decade (MRC, 2003b). Expansion of irrigated area coupled with dissemination of modern technology has enabled the country to attain food self-sufficiency since 1999, when the rice production exceeded 2 million tons for the first time (ADB, 2002). However, irrigation systems are small by international standards and they suffer from low levels of maintenance (ADB, 2000). Irrigation systems on the low land floodplains are usually supplied with water from rivers pumped by diesel or electric pumps. In the uplands, irrigation systems are generally small-scale gravity systems (ADB, 2000).

Generally, the focus of irrigation development is now on improving management and control to increase water productivity and facilitate diversification to higher valued crops (Barker & Molle, 2002). A new strategic development plan for irrigation sector was adopted in Laos by a Prime Minister's Decree in 1998. It stresses water resources planning, irrigation management transfer (IMT), community-managed irrigation, irrigation technology, training and extension (ADB, 2000). Attention has turned to improving the operation and maintenance of existing irrigation systems in the lowlands and developing small-scale systems in the uplands to encourage crop diversification and to reduce shifting cultivation in Laos. But the fact that irrigation systems tend to be designed specifically to suit rice production, makes it difficult for farmers to diversify into non-rice crops (MRC, 2003b).

The purpose of this paper is to describe implementation process and problems facing irrigation management transfer policy in Laos. Several irrigation case studies

show that the sustainability of irrigation systems depends on farmers' ownership of the scheme and their participation in its management. Therefore, the most important aspect of the paper is to evaluate through case studies how the IMT process is affecting the sustainability of irrigation development. The paper also aims at contributing in the discussion on suitable ways of implementing IMT in Laos. The increasing competition and conflict over water, growing populations, the declining availability of public sector funds for irrigation and the need to evaluate performance of irrigation systems after reforms makes it important to assess the IMT process and the sustainability of irrigated agriculture (Vermillion, 2004).

The article presents five case studies of irrigation development projects in Laos. Several government officials from central, provincial and district levels were interviewed as well as Asian Development Bank (ADB) and irrigation development project representatives. Field survey was conducted in October to November 2004 in seven different villages, with interviews with Water User Groups (WUGs), Village Headmen and Lao Women's Union¹ representatives. The outcomes and content of this paper are based to a large extent on interviews done during the field visits because published, credible information related to this subject is hard to come by in Laos.

2 Irrigation management transfer

In the area of institutional reform, the devolution of management and financial responsibility from irrigation systems managers to local user groups, so called irrigation management transfer process, has gained prominence globally (Barker & Molle, 2002). The poor sustainability of irrigation schemes has led also the Lao government to reconsider the organization of irrigation management. The transfer of irrigation schemes' ownership from the government to farmers should lead to sustainable irrigated agricultural development with little government involvement. (Phalasack, 2004). The government objective is to transfer all of approximately 20,000 irrigation schemes to farmers by year 2020. Of these 20 000 schemes, about 2 000 are medium-sized schemes and a priority for the IMT. The vast majority of existing schemes are very small, and thus already in practice managed by farmers themselves. (Personal communication 1).

¹ Lao Women's Union is a government organisation working at national, provincial, and district levels improving the position of women in Laos

Water user associations (WUAs) are seen by many social scientists as an essential element for improved irrigation systems performance (Barker & Molle, 2002). Also in Laos, a central part of IMT is the establishment of a WUA for each irrigation scheme. According to a Ministerial Regulation from the year 2000, WUAs will exercise the following functions: own property, make and enforce internal rules and regulations, select authorized representatives without external interference, raise funds, open and operate bank accounts, extract water from a specified source, and enter into agreements. (ADB, 2000). Water User Groups (WUGs) have also been created to manage irrigation schemes constructed by the government or various multilateral and bilateral donors. However, these groups have mostly been established with little training and preparation for members on how to really manage the scheme. In addition, as the government has constructed the schemes and given regulations on their management, there has been no farmer ownership for the schemes. Subsequently, the activities of WUGs have subsided and the schemes have broken down. (Personal communications 2 and 3).

Both WUGs and WUAs are officially registered at district and provincial levels, respectively. Yet, a WUG has much more limited rights, so that it cannot, for instance, enter into commercial agreements or borrow money as an organization. In a sense, a WUG is a pre-stage for becoming an Association. By the end of year 2004, only about five WUAs have been registered². Also as a whole, the IMT has proven to be more difficult process than perhaps anticipated; for the year 2003, the government aim was to transfer 150 schemes, but only five were actually transferred to farmers. In total, around 860 schemes have been transferred to communities to some extent. The transfer might include only the right to use the scheme, or the management of the headwork. (Personal communication 1).

The difficulties on the IMT implementation are related to several issues. Firstly, the government capacity remains limited at central, provincial, as well as district level. At the central level, there is no single ministry responsible for implementing water laws or overseeing the WUA development. The Water Resources Co-ordination Committee might play some role in this in the future but at the moment it also lacks resources and political authority. (Personal communication 4). Secondly, the legislation on IMT is unclear. Regulations on WUAs and Irrigation Transfer are not in line with other legislation stating that government property cannot belong to anybody. Thus, with the lack of defined water rights, it is still not clear, for example,

² In some cases, WUGs have also been registered unofficially at the district level as Associations awaiting the eventual official registration at the province level. For the sake of clarity, however, we refer here to groups not officially registered at the province as WUGs.

whether farmers could after IMT sell or rent their irrigation system. (Personal communication 1). Capacity problems at provincial and district level, for their part, are related to the dissemination of information on IMT and the implementation of participatory processes. Few government officials understand the participatory approach, as the education system has only very recently began to involve some training on the social side of irrigation management. (Personal communication 2, 3). At the village level, lack of education further complicates the adoption of IMT principles (Personal communication 5).

The process of IMT is also hindered by the ambivalent relationship between the government and the people. As IMT is not a new thing in Laos, but rather something that has already once been implemented, although badly, people have little interest in re-engaging in the process. With no sense of ownership in schemes, farmers are reluctant to take responsibility for their management but often rather expect the government to assist, as it has always done, if and when the scheme breaks down. In some cases district official's skeptical approach to the IMT has also made farmers careful in taking part in the schemes (Personal communication 2, 3, and 6). In addition, farmers sometimes hesitate to register as an association even when a WUG is functioning effectively, because they suspect the WUA would be treated as a company and taxed accordingly (Personal communication 1).

A major failure of WUGs has been their inability to collect funds for the maintenance of irrigation schemes and, in the case of pump schemes, for paying for electricity. For instance, in Vientiane Municipality area, there is about 1700 hectares of irrigated area but sufficient funds are collected only for 10-20 per cent of this area. (Personal communication 5). It is difficult for WUGs with poor organization and little authority to collect irrigation fees, especially if the scheme itself is not functioning well. Farmers may be reluctant to pay or, of course, they may simply not have money to pay for fees. In line with the previous government policy, the majority of farmers still grow rice for subsistence, selling the possible surplus. Also irrigation extension is mostly used for growing dry season rice, even in places, where it causes excessive electricity costs due to unsuitable soils. (Personal communication 2). For poor farmers barely growing enough for their own consumption, risks of changing techniques are high. Furthermore, the poorest communities are often located in remote areas with difficult access to markets for selling products. (Personal communication 7).

The Asian Development Bank is funding two major development projects in Laos focusing on irrigation development and IMT at community level. The first of these, the Community-Managed Irrigation Sector Project (CMI) was finalized in

2004 and has entered a second phase. The CMI concentrates on poverty reduction through increased agricultural production in remote areas of Northern Laos. The activities include, among other things, strengthening community ownership of irrigation schemes, rehabilitation of small-scale gravity irrigation, and promoting agricultural extension. (ADB, 2004b). An important part of the project has been the construction and rehabilitation of access roads to villages (Personal communication 8). The other ADB project, Decentralized Irrigation Development and Management (DIDM), focuses more directly on piloting the IMT and strengthening WUAs in order to establish sustainable irrigated agriculture (ADB, 2000). In DIDM, irrigation schemes are medium-sized pumped schemes, with an average area of around 200–250 hectares, and with the project emphasis on diversification and commercialization of irrigated agriculture. The project aims at rehabilitating schemes with the participation of communities, while establishing and strengthening WUGs for an eventual registration as WUAs, and thus the transfer of ownership. The DIDM project began in year 2001. (Personal communication 2).

The CMI project has been rated as highly successful on most criteria under ADB's own performance monitoring system. In an evaluation of established Water User Organization's performance, 50 per cent of them were rated good or very good, 41 per cent as fair, and 9 per cent as poor. (ADB, 2003). In comparison with an evaluation of government schemes in one province, the figures seem promising. Of the government schemes evaluated, 10 per cent were operating well, 80 per cent were poorly operated or barely in operation, and 10 per cent were not operating at all. (Personal communication 1). The ADB, furthermore, evaluates the overall sustainability of CMI schemes strong, with a high level of ownership and a lack of alternative livelihood options in project villages. However, the project has also faced difficulties related to, for example, participation of women and ethnic minority groups speaking other languages than the official Lao Loum. In addition, the project initially benefited mostly those having land within the command area, and not the poorest villagers with no land. There have been attempts to address these issues with additional project activities. (ADB, 2003).

The DIDM project has likewise met with difficulties on facilitating meaningful participation of communities. It has been acknowledged that it is most time-consuming to create participation and ownership in the schemes. With a tight project schedule, lack of qualified local people in the district and provincial levels, and the need to re-motivate communities for irrigation management, participation has not always been fully realized. It has taken time to convince some of provincial staff on the possibilities of participatory approach, and even the expatriate

consultants themselves have at times disagreed on to which extent participation must be implemented. (Personal communications 2 and 3). On the Lao government side, the DIDM is seen as one of few reasonable approaches to IMT in the country. However, it is not considered possible to implement the whole IMT process through the same approach, because of the great amount of time and funds needed. Instead, the schemes might be transferred to farmers already before their rehabilitation, and farmers would then repair the schemes for themselves. (Personal communication 1).

3 Case studies

CMI Sub-projects

There are four CMI sub-projects located in the Vang Vieng District of Vientiane Province. The topography of area is mountainous and all the irrigation schemes are gravity systems. Through the CMI project, concrete weirs were constructed to replace earlier wooden structures, which required rebuilding at least once each year. (Personal communication 8). Villagers contributed to construction work mainly through labor participation and also by providing, for instance, timber, sand and gravel. (Lao PDR, 2003).

The Nam Lao I sub-project is utilized by four villages. The Ban Phone Pheng has 232 households and 152 ha of rice fields during the wet season. During the dry season, there is not enough water for rice, but villagers have 10–12 ha of vegetable gardens. Since the beginning of project in 1999, the wet season rice crop has doubled into 4,5 tons per ha, which is mostly enough for villager's own consumption. The WUG collects a water user fee of 50 000 kip per ha, which is considerably less than originally recommended. However, after the CMI funding ended, the villagers have been able to save 1000 US\$ for the Village Fund and have utilized the money for expanding irrigated area. Because of training received within the CMI, the villagers were able to do the construction work by themselves. Farmers are confident on their technical knowledge on farming, and the possibilities of developing the village even with no government assistance. (Personal communication 9).

The Phone Pheng village was established over 200 years ago, but there are only 25 original households left. Most of villagers belong to the Laolum. JICA has established a kindergarten school to the village helping especially the Hmong migrating in the area in receiving education. Women in the Phone Pheng have received training from the Lao Women's Union to produce organic fertilizers and insecticides from local ingredients. The soil in the area is not very good, but organic fertilizers are improving

the situation. Organic insecticides are likewise seen beneficial, as they are safe to use. Organic farming can also provide an advantage in marketing products to nearby markets. Already, some local restaurants catering for tourists buy vegetables directly from the village. Through the CMI project, access roads to the nearby villages and the market place were improved, so that transportation no longer causes difficulties. There are three households in the Phone Pheng village that are considered poor. These households are mainly headed by widowed women, and lack labor for rice growing. Slash and burn agriculture has not been done for last ten years, as it was found too laborious. (Personal communication 9).

The Na Lao village belongs to the Nam Ngat sub-project along with two other villages. Ban Na Lao has only 55 households and 146 people. As a result of CMI project, villagers now have secure dry season rice crop and also have started growing rice during the wet season. The soil in the area is not very good and villagers do not always have money for fertilizers. The current dry season crop is about 2–2,5 tons per ha, and the wet season crop is 1 ton per ha. The water user fee has been collected for three years, although in 2004 there were problems with the payments. There is no Village Fund and not enough funds to lend for villagers. Farmers have received training on growing vegetables and establishing demonstration farms, but none have been implemented yet. Women used to grow onions for sale, but recently cows destroyed the whole crop and there is no money to buy new onions. (Personal communication 10).

The CMI project has improved the access road, yet the river to the village can only be crossed on foot for about three months a year. There are 13 families in the Na Lao village that are considered poor, 6 of whom are extremely poor. The main reasons stated for the large number of poor households is the lack of land and budget for alternative livelihoods, which makes people reliant on the rice crop. Currently, the village has received some income from selling forest for logging. There is also some fish farming in the rice fields during the dry season. Villagers no longer practice slash and burn agriculture, but other people are now utilizing their old area for the same purpose. (Personal communication 10).

DIDM Sub-projects

Three DIDM irrigation sub-projects, which are all medium-sized pumped schemes, were visited in Vientiane Municipality and Bolikhamxay District. The sub-project of Hai Thangone village is located about 20 kilometers from Vientiane. Because of the vicinity of the capital, the village has a good and easy access to services

and markets. There are 196 households and 106 hectares of irrigated fields in Hai Thangone village. Rice production is predominant in the wet and dry season and some vegetables and fruits are also grown during the dry season. It appears that food security is not a problem for the majority of the villagers, because most people are able to sell their surplus crops to the market. Instead, labor for planting and harvesting is not sufficient, because especially young people migrate to towns to find a job. (Personal communication 11).

Farmers have contributed with their labor to the construction and rehabilitation of irrigation system, and they are now trained on marketing and growing different crops. Each year the WUG organizes a meeting to plan for system's operational maintenance including financing and production. The WUG consist mostly of women, because the villagers think that working on the rice field is more women's work and about half of the WUG members are government officers working outside the village. The WUG is experiencing difficulties to assemble farmers for meetings and to distribute information to them. Close relationships among the WUG members inhibit the members to interfere in malpractices of the group. The collection of irrigation fees is not sufficient to cover all maintenance costs of the scheme. Due to the project, the tasks and rules of WUG have become clearer and villagers' ownership to the irrigation project has increased. (Personal communication 11).

DIDM project is implemented in three districts in Pakxan Province covering 1850 hectares and benefiting 10,000 households with the aim of increasing their incomes at least 35 per cent per year. Pakxan village was established about 150 years ago. The government constructed a small irrigation system in the village in 1996 and the DIDM-project started in 2001. Irrigated area in this village covers 256 hectares and water for the irrigation is pumped from the Mekong River using 4 pumps. The WUG consists of two villages with 346 members and 165 households, of which 25 are considered poor ones. Many men are working for the government outside the village, and it means that women are participating in the operation of WUG. In each year meetings are arranged for farmers of every canal area headed by a canal manager, who will report the outcomes of the meeting to the WUG. The WUG will then evaluate the results and plan activities and budget for the next season. (Personal communication 12).

Farmers need to pay fees for the land, administration and maintenance of irrigation system, and electricity for the irrigation development fund, which is only used for the maintenance and repair. Farmers can pay the fees both in cash and rice. Farmers are still growing rice in areas that are usually flooded every year and therefore the crop yield is very low. The DIDM project provides training in project

management, operation and maintenance of irrigation system and financing to the farmers. Seven village extension workers provide training for crop diversification, rice growing techniques and fish farming. Because the project has expanded the irrigated area and has improved diversification of crops and rice production, incomes have increased and the farmers feel that their livelihood has improved. Financial system is much clearer to the farmers and they are well informed of the budget costs and know beforehand the amount of fees to be paid. The ownership of the farmers to the project and operation and maintenance of the system seems to be increased. On the negative side, there have been problems with water distribution to some farmers and not all them are following the rules that the WUG has set up. (Personal communication 12).

KM-6 Project

The KM-6 project in the Vientiane Municipality was initiated in 1989 with the aim of decreasing rice shortage in the capital area and increasing the production of non-rice crops for both domestic consumption and exports (JICA, 1990). The project began operating in 1994, covering an area of about 1200 ha. The project area consists of 16 villages and around 1500 households. The irrigation is based on water pumped from the Nam Ngum and transferred via an 11-km long main canal and a regulating pond to the fields. There are four pumps, but one of them has broken down, so the area under irrigation should be decreased. (Personal communication 13). The project was executed with the help of JICA, and also includes an additional 500 ha to be developed with the government funding (JICA, 1990). So far, only about one third of this additional area has been developed due to the lack of funds. Along the main road to the nearby Vientiane, some of the original irrigated agricultural area has also been converted to other uses with the development of capital city. (Personal communication 13).

Since the inception of project, rice yields have increased considerably. According to a JICA estimate, dry season yield before the project was about 2,5 tons per hectare and wet season crop 1,5 tons per hectare. (JICA, 1990). Currently, corresponding figures are 4,7 and 3,8 tons per hectare. About 95 per cent of irrigated area is still paddy fields, while the rest consists of vegetable gardens, fruit trees, and fishponds. Each of the 16 villages within the project has a WUG with a leader and two deputies. The WUG members are selected at an annual village meeting from candidates filling the following qualifications: the member must be a full-time farmer; the member should not be poor or in risk of becoming poor; and the member must be a person

respected by others. The work of WUGs is coordinated by the project office, which holds workshops with farmers before and after the harvest to exchange knowledge, evaluate results, and to agree on water user fees. WUGs are also responsible for maintaining 3rd and 4th level canals, while the office is in charge of the main ones. (Personal communication 13).

Even though incomes from farming have increased, a major problem with the KM-6 scheme is the collection of water user fees. Currently at best 50 per cent of fees are collected. To pay its expenses, the project operates its heavy machinery, like tractors and bulldozers, outside the scheme. (Personal communication 13). A reason for difficulties with payments is the weakness of WUGs. Chairmen are often not elected but appointed, and they may have little motivation on the work. Group members have also little training and knowledge on, for instance, bookkeeping and the WUG rules and regulations are neither clear. (Personal communication 1). An aim of the project is to transfer the scheme to farmers, as they now have no sense of ownership for it. Yet, at the moment WUGs are not seen as able to draft themselves clear legislation, or to diversify their crops without clear leadership of the project office. (Personal communications 1 and 13).

4 Evaluation of imt experiences

Despite country's significant dependence on water resources and Lao government policy on integrated water resources management, IWRM has not yet been institutionalized and the concept is still unfamiliar for many officials even at ministerial level. IWRM approach should be applied as a framework to address poverty and food insecurity in the management of natural resources in a sustainable way. In the irrigation sector the implementation of IWRM approach can be detected only in the long-span efforts to reduce shifting cultivation.

Socio-economic development in rural areas is hampered by, among other things, insufficient amount of capital, the lack of capable government personnel, low levels of education, and language problems especially related to different ethnic minorities. Marketing of agricultural products and infrastructure linkages are often weak in remote areas. The productivity of irrigated agriculture and, especially the marketing opportunities for products, need to be improved substantially before the hand-over of the schemes to the farmers. Massive and intensive training at various levels is essential. Farmers are often reluctant to finance and expand their livelihoods activities through lending from the bank, WUG or village development fund and

they are sometimes even unknowing on how to do it. This situation needs to be changed, because unless income generation increases significantly, sustainability of the irrigation systems cannot be ensured. The government needs to provide a suitable policy environment and adequate agricultural extension services to the farmers.

Based on the field visits and interviews done, it seems that participatory management of irrigation schemes can lead to increases in the value of irrigated agricultural production and the efficiency of water use. The positive outcomes of irrigation projects include increased availability of water, and thus increase in yields, and improved flexibility in cropping patterns, which have to some extent enabled a shift towards producing high value cash crops. The training provided on agricultural extension and irrigation operation and management is reducing farmers' dependence on government aid. Another benefit to farmers, especially for women, is the diversification of livelihood opportunities.

Even in new projects emphasizing participation, questions of farmers' ownership and commitment to irrigation schemes can be difficult issues. It seems that it is quite difficult to get farmers to really commit to their responsibilities under the new IMT partnership due to the fact that people are used to depending on the government. The insufficient institutional capacity of provincial and district authorities and the lack of adequate extension services are retarding the IMT-process and in fact the sustainability of the irrigation systems itself. It seems that it is not possible to implement "IMT-packages" that are meant to be applicable in each village within a certain area, because each village has different demands and economic and cultural differences are enormous. It might be preferable to offer a range of possible solutions to farmers to implement the IMT-process and to allow considerable variations of WUGs formation and management.

The outcomes of irrigation development vary according to the physical constraints, such as the quality of soil or availability of land in a village, but also to a great extent according to the participation of villagers in the scheme. Johnson et al. (2001) have used a typology of participation based on the authority for decision-making: consultative, collaborative and collegial. In consultative participation water users provide inputs for decision-making but the authorities in charge retain the decision-making power. In collaborative participation the control over decisions and accountability for outcomes is shared between actors, and in collegial participation water users have both responsibility and authority for project activities. In Lao government's irrigation schemes the emphasis has clearly been on the collaborative participation: villagers' input is acknowledged but there are doubts on their ability

to manage the schemes. In DIDM project, the aim has been to create collegial participation, but due to project constraints this has perhaps not been fully achieved. Likewise, in the CMI subprojects, some WUGs have a strong sense of ownership on the schemes and they have also initiated additional activities, but some villagers still have not claimed full responsibility for the irrigation development.

Guaranteeing women access to irrigation water and giving them a voice in water users association is an important step in improving the productivity of many irrigation schemes. (Molden & de Fraiture, 2004). In Laos, women play an essential role in agriculture and village economy. Women, especially the Laolum women, have had a relatively high social status in comparison with women in several other Asian countries. However, the situation of women is changing with the economic transformation and mechanization of agriculture. Also the position of women varies greatly within different ethnic groups. (Schenk-Sandbergen & Choulamany-Khamphoui, 1995). Women do generally participate to some extent in the WUGs but, for instance, the lack of education and language problems affect especially women's participation. There is, however, one area where women are strongly represented: the WUG accountants and bookkeepers are usually always women. Women are mostly responsible for household funds and they are thus cautious on spending money and follow closely the agreed rules on lending the WUG funds. (Personal communication 2, 3, and 5).

5 Conclusions

In Laos, the government is still seeking best possible ways of implementing the irrigation management transfer. Experiences from irrigation development projects indicate the importance of farmer's ownership in the schemes. However, establishing functioning water user organizations requires considerable government support that at the moment is lacking. The administration of water resources needs to be clarified with clear responsibilities for each government agency. The successful implementation of the IWRM approach requires co-ordination between all the relevant stakeholders.

References

- ADB. (2004a) *Country Paper. National Water Sector Apex Body*. (Asian Development Bank. Regional Meeting of National Water Sector Apex Bodies. Leadership in Water Governance, 18-21 May 2004, Hanoi, Viet Nam. http://www.adb.org/Water/NWSAB/2004/Lao_PDR_Country_Paper.pdf)
- ADB. (2004b) *Report and Recommendation of the President to the Board of Directors on a Proposed Loan to the Lao People's Democratic Republic for the Northern Community-Managed Irrigation Sector Project*. (Asian Development Bank. RRP: LAO 34188).
- ADB. (2003) *Special Evaluation Study on Participatory Approach in Forest and Water Resources Operations in Selected Developing Member Countries*. (Asian Development Bank. SST: REG 2003-32).
- ADB. (2002) *Report and Recommendation of the President to the Board of Directors on a Proposed Loan to the Lao People's Democratic Republic for the Nam Ngum River Basin Development Sector Project* (Asian Development Bank. RRP:LAO 33356).
- ADB. (2000) *Report and Recommendation of the President to the Board of Directors on a Proposed Loan to the Lao People's Democratic Republic for the Decentralised Irrigation Development and Management Sector Project*. (Asian Development Bank. RRP: LAO 30254).
- Barker, R. & Molle, F. (2002) *Perspectives on Asian Irrigation*. (Paper presented at the Conference on Asian Irrigation in Transition – Responding to the Challenges Ahead, 22–23 April 2002, Asian Institute of Technology Bangkok, Thailand. <http://www.iwmi.cgiar.org/Assessment/files/pdf/publications/ConferencePapers/AIT%20paper4.pdf>)
- GWP. (2003) *Dialogue on Effective Water Governance: Learning from the Dialogues*. (Global Water Partnership, <http://www.gwpforum.org/gwp/library/Effective%20Water%20Governance.pdf>)
- JICA. (1990) *Basic Design Study Report on Agricultural and Rural Development Project in the Suburbs of Vientiane in Lao People's Democratic Republic*. (Japan International Cooperation Agency).
- Johnson, N., Munk Ravnborg H., Westermann, O. & Probst, K. (2001) *User Participation in Watershed Management and Research*. (CAPRI Working Paper No. 19.)
- Lao PDR. (2003) *Completion Report on Community Mobilisation and Training. Community Managed Irrigation Sector Project*. (Nippon Koie Co., Ltd in Association with NIA Consult, Inc. and BURAPHA Group. Vientiane).
- Molden, F. & de Fraiture, F. (2004) *Investing in Water for Food, Ecosystems and Livelihoods*. Comprehensive Assessment of Water Management in Agriculture. Blue Paper. (Stockholm. <http://www.iwmi.cgiar.org/Assessment/files/pdf/BluePaper.pdf>)
- MRC. (2003) *State of the Basin Report: 2003*. (Mekong River Commission, Phnom Penh, Cambodia).
- Phalasack, P. (2004) *Lao Irrigation Systems Governance Mode*. Paper presented at the Third FMIS Seminar, Katmandu, Nepal, 9-10 September.
- Schenk-Sandbergen L. & Choulamany-Khamphoui, O. (1995) *Women in Rice Fields and Offices: Irrigation in Laos. Gender Specific Case-studies in Four Villages*. (Empowerment, Heiloo. The Netherlands).

- Van Hofwegen, P. (2000) *Framework for Assessment of Institutional Frameworks for Integrated Water Resources Management*. Proceedings of an International Workshop “Integrated Water Management in Water-Stresses River Basins in Developing Countries: Strategies for Poverty Alleviation and Agricultural Growth,” Loskop Dam, South Africa, 16–21 October 2000. <http://www.iwmi.cgiar.org/pubs/Proceedings/Loskop/index.htm>
- Vermillion, D. (2004) *Creating an Enabling Environment for Productive and Sustainable Water Users Associations*. (Paper prepared for Seventh Seminar of the International Network for Participatory Irrigation Management, Albania, June 2004.)
- WRCC (Water Resources Coordination Committee). (2004) *Implementing Integrated Water Resources Management in the Nam Ngum Basin*. Nam Ngum River Basin Development. Draft Final Report. Institutional Issues Report. Volume 2. (Bceom Socié'te Francaise D'Inge'nierie and Mekconsultants, Lao PDR, Vientiane).

Personal Communications

1. Division Director, Department of Irrigation, Ministry of Agriculture and Forestry. Interviewed on 3 November 2004. Vientiane, Laos.
2. Financial Management and Institutional Development Specialist, Department of Irrigation, Ministry of Agriculture and Forestry. Interviewed on 22 October 2004. Vientiane, Laos.
3. Water Management Specialist, Department of Irrigation, Ministry of Agriculture and Forestry. Interviewed on 22 October 2004. Vientiane, Laos.
4. Deputy Team Leader, Water Resources Coordination Committee Secretariat. Interviewed on 21 October 2004. Vientiane, Laos.
5. Head of Division, Department of Irrigation, Ministry of Agriculture and Forestry. Interviewed on 27 October 2004. Vientiane, Laos.
6. Project Implementation Officer, ADB Lao Resident Mission. Interviewed on 20 October 2004. Vientiane, Laos.
7. Team Leader, Office of the National Project Manager, Ministry of Agriculture and Forestry. Interviewed on 25 October 2004. Vientiane, Laos.
8. Project Coordinator, Department of Irrigation, Ministry of Agriculture and Forestry. Interviewed on 3 November 2004. Vientiane, Laos.
9. Interview at the Ban Phone Pheng with the Chairman of Water User Group, two WUG members and a Lao Women's Union (LWU) representative. 4 November, 2004, Vientiane Province, Laos.
10. Interview at the Ban Nalao with the Head of Village, a representative of village, and a representative of LWU. 5 November 2004, Vientiane Province, Laos.
11. Interview at Hai Thangone with the Head of Vientiane Capital Project Office, Deputy Village Head and Deputy of Water User Committee, and the Head of District Project Office. 1 November 2004, Vientiane Municipality, Laos.
12. Interview at Pakxan with the Head of Water User Group and the Village Headman. 2 November 2004, Bolixhamsay Province, Laos.
13. Interview with the Project Director, 27 October 2004. Vientiane Municipality, Laos.