CDRI - Cambodia's leading independent development policy research institute

IMPROVING THE GOVERNANCE OF WATER RESOURCES IN CAMBODIA: A Stakeholder Analysis

Understanding Stakeholders' Roles, Perceptions and Constraints for Effective Irrigation and Catchment Management and Development

NANG Phirun, KHIEV Daravy, Philip HIRSCH and Isabelle WHITEHEAD

Working Paper Series No. 54

June 2011

A CDRI Publication

IMPROVING THE GOVERNANCE OF WATER RESOURCES IN CAMBODIA:

A Stakeholder Analysis

Understanding Stakeholders' Roles, Perceptions and Constraints for Effective Irrigation and Catchment Management and Development

CDRI Working Paper Series No. 54

NANG Phirun, KHIEV Daravy,

Philip HIRSCH And Isabelle WHITEHEAD

CDRI - Cambodia's leading
independent development policy research institute

Phnom Penh, June 2011

ISBN-10: 99950–52–45-4

Improving the Governance of Water Resources in Cambodia: A Stakeholder Analysis
Understanding Stakeholders' Roles, Perceptions and Constraints for Effective Irrigation and Catchment Management and Development

CDRI Working Paper Series No. 54

June 2011

Authors:

NANG Phirun	Research Associate, Natural Resource and Environment Programme, CDRI.
KHIEV Daravy	Former Research Associate, Natural Resource and Environment Programme, CDRI.
Philip HIRSCH	Professor of Human Geography and Director of Australian Mekong Resource Center, School of Geosciences, University of Sydney
Isabelle WHITEHEAD	Research Associate, Natural Resource and Environment Programme, CDRI.

Front cover photo: Svay Chek Scheme, Kampong Chhnang province

CDRI
56, Street 315, Tuol Kork, Phnom Penh, Cambodia
PO Box 622, Phnom Penh, Cambodia
Tel: (+855-23) 881-384/881-701/881-916/883-603/ 012 867-278
Fax: (+855-23) 880-734
E-mail: cdri@cdri.org.kh
Website: http://www.cdri.org.kh

Design and layout: OUM Chantha
Printed and bound in Phnom Penh, Cambodia by T & S Printing

Table of Contents

List of Figures

List of Table

List of Appendices

List of Acronyms

ADB	Asian Development Bank
AFD	Agence Française de Développement
APS	Associazione per la Partecipazioneallo Sviluppo (Italian NGO)
AusAID	Australian Aid for International Development
ASEAN	Association of Southeast Asian Nations
CAVAC	Cambodia Agricultural Value Chain Programme
CC	Commune Councils
CDC	Council for the Development of Cambodia
CDRI	Cambodia Development Resource Institute
CEDAC	Cambodian Centre for Study and Development in Agriculture
CNMC	Cambodia National Mekong Committee
CSO	Civil Society Organisations
DAE	Department of Agricultural Extension
D&D	Decentralisation and Deconcentration
DfID	Department for International Development (UK)
FACT	Fisheries Action Coalition Team
FAO	Food and Agriculture Organisation of the United Nations
FGD	Focus Group Discussion
FiA	Fisheries Administration
FWUC	Farmer Water User Community
FWUG	Farmer Water User Group
GDCC	Government-Donor Coordination Committee
GDP	Gross Domestic Product
GEF	Global Environment Facility
GRET	Groupe de Recherche et d'Echanges Technologiques
GMS	Greater Mekong Sub-region
GWP	Global Water Partnership
ha	hectare
ICMSC	Irrigation and Catchment Management Sub-committee
IFAD	International Fund for Agricultural Development
IMF	International Monetary Fund
IMT	Irrigation Management Transfer
IPM	Integrated Pest Management
ISF	Irrigation Service Fee
ITC	Institute of Technology Cambodia
IWRM	Integrated Water Resources Management
JICA	Japan International Cooperation Agency
KOICA	Korea International Cooperation Agency
LA	Local Authority
M&E	Monitoring and Evaluation
MAFF	Ministry of Agriculture, Forestry and Fisheries
MEF	Ministry of Finance
MIME	Ministry of Industry, Mines and Energy
MOE	Ministry of the Environment
MOI	Ministry of the Interior
MOWRAM	Ministry of Water Resources and Meteorology

MRC	Mekong River Commission
n.a.	Not available
NCDD	National Government Committee for Decentralisation and De-concentration
NGO	Non Governmental Organisation
NIS	National Institute of Statistics
NISDP	Northwest Irrigation Sector Development Project
NRE	Natural Resources and Environment Programme (at CDRI)
NRM	Natural Resources Management
O&M	Operation and maintenance
ODA	Overseas Development Assistance
PDAFF	Provincial Department of Agriculture, Forestry and Fisheries
PDOE	Provincial Department of Environment
PDORD	Provincial Department of Rural Development
PDOWRAM	Provincial Department of Water Resources and Meteorology
PDRD	Provincial Department of Rural Development
PFiA	Provincial Fisheries Administration
PIMD	Participatory Irrigation Management and Development
PIPA	Participatory Impact Pathways Analysis
PRDC	Provincial Rural Development Committee
PRDC-Excom	Provincial Rural Development Committee-Executive Committee
PSDD	Project to Support Democratic Development through Decentralisation and Deconcentration
RGC	Royal Government of Cambodia
RUA	Royal University of Agriculture
RUPP	Royal University of Phnom Penh
SaciWATERS	South Asian Consortium for Interdisciplinary Water Resources
SAW	Strategy on Agriculture and Water
SBK	Social Business Khmer
TSA	Tonle Sap Authority
TSB	Tonle Sap Basin
TSBMO	Tonle Sap Basin Management Organisation
TSBR	Tonle Sap Biosphere Reserve
TWGAW	Technical Working Group on Agriculture and Water
UNCED	United Nations Conference on Environment and Development
UNDP	United Nations Development Programme
UNESCAP	United Nations Economic and Social Commission for Asia and the Pacific
UNESCO	United Nations Educational, Scientific and Cultural Organisation
USD	United States Dollar
WB	World Bank
WFP	World Food Programme
WHO	World Health Organisation
WRMRCDP	Water Resources Management Research Capacity Development Programme

Acknowledgements

The authors offer sincere thanks to Dr Rebecca F. Catalla, research advisor; Mr Yem Dararath, former coordinator of the Natural Resource and Environment (NRE) Programme and Water Resources Management Research Capacity Development Programme (WRMRCDP) team leader; Mr Kim Sour, the present WRMRCDP team leader; Mr Chem Phalla; Ms Chea Chou; Ms Jessie Connell and Ms Susan Watkins for reviewing, coordinating and facilitating this working paper's development and publication. Our special thanks go to Dr Pech Sokhem, manager, International Development Project Group, senior environmental governance specialist, Hatfield Consultants Partnership, and advisor for the governance component of WRMRCDP, for his extended comments on this paper.

We also acknowledge other CDRI staff whose contributions have been invaluable to this work: Mr Ros Bansok, Mr Pich Lonn Dara, and Ms Sam Srey Mom. We thank Mr Khol Many, the WRMRCDP counterpart from the Ministry of Agriculture, Forestry and Fisheries (MAFF), and Mr Nong Keamny from the Ministry of Water Resources and Meteorology (MOWRAM) for their coordination and facilitation as well as comments on this research.

We express our sincere gratitude to Dr Sin Sovith, national officer and Mr John Dore regional advisor of AusAID, who regularly advised and closely monitored the research's progress and quality. Special thanks go to Mr Chann Sinath, deputy secretary general of MOWRAM and co-chair of WRMRCDP, and Mr Mak Soeun, director of the Agricultural Extension Department of MAFF, for their guidance.

We sincerely appreciate the contributions of the many interviewees in sharing their first hand knowledge and personal observations of water resources management issues in Cambodia and the selected study sites. Our thanks go to the officials of MOWRAM and MAFF for their strong support and participation in the WRMRCDP implementation as well as the directors and staff of the Provincial Department of Water Resources and Meteorology (PDOWRAM) and the Provincial Department of Agriculture, Forestry and Fisheries (PDAFF) in Kampong Chhnang, Pursat and Kampong Thom for their active involvement in the participatory research, training and dissemination.

We are also grateful to the Farmer Water User Community (FWUC) leaders and members for their contributions to the research, particularly during data collection, and sharing their local knowledge and views. We extend our deep thanks to the district governors, commune councils, village leaders and villagers in the study areas for their participation in this research.

Finally, we acknowledge our deep appreciation to CDRI senior management – Mr Larry Strange, executive director and Mr Ung Sirn Lee, director of operations – for their critical guidance and advice that motivated and inspired us in developing this report.

Executive Summary

Irrigation development and management of water resources present serious governance challenges for many stakeholders in Cambodia. Farmers, government agencies, development organisations and the private sector all have a role to play, yet their roles and responsibilities are not always well defined. Contemporary ideas on water governance indicate a greater need for participation and ownership of local resources by the communities that use those resources. As such, there is a need to refine and rethink the way in which key stakeholders relate to each other and make decisions on the use of water for irrigation.

This paper analyses stakeholder roles, relationships and perspectives with respect to Cambodia's water resources management, with a specific focus on irrigation and catchment management. It also examines the degree of consistency or disparity between different stakeholders, and between formal stakeholder roles and actual practices. Data from key informant interviews, field observations, focus group discussions (FGDs) and dissemination workshops have been analysed to draw out the main issues relating to water governance stakeholders and to resolve knowledge gaps. It examines water-related institutions and stakeholder agencies in depth to gain an understanding of their current capacity and potential. The research findings are presented in a way that will assist public policy decision-makers to compare and evaluate policy alternatives.

Several theoretical approaches guided this study, one of which is the stakeholder typology. Developed as part of the analysis, this perspective has enabled a broad definition of stakeholders in terms of their relative ***power*** (influence), ***legitimacy*** (interest) and ***urgency***. The analysis is also broadly informed by existing literature on stakeholder relationships and governance mechanisms, especially as they relate to water governance. This includes Integrated Water Resources Management (IWRM), which advocates for the proper coordination and active participation of stakeholders from all relevant sectors. Its underlying assumption is to consider the social, cultural, political, economic and ecological aspects of water as being interrelated and equally valuable.

Findings

The study found that irrigation schemes and rural infrastructure in Cambodia are often jointly funded by the government and external donors, with in-kind contributions (such as land and labour) from project beneficiaries. Water-related issues are handled by several overlapping ministries and committees with differing, yet specific, mandates, ambitions and policies. Responsibilities for water resources policy and planning are increasingly delegated to sub-national authorities and the Provincial Department of Water Resources and Meteorology (PDOWRAM). This decentralisation of water management is consistent with the government's wider process of sub-national governance reform, recognising the need to introduce new systems of governance at provincial, municipal and district levels.

The present water governance system, however, is challenged by the lack of effective feedback mechanisms and coordination among the different levels of government. Urgent improvements are needed to improve the functioning of vertical governance mechanisms linking central government, provincial and local authorities and villages, as well as to improve horizontal governance mechanisms in support of decision-making across different departments, commune and village level authorities. For the reforms to be implemented effectively, the responsibilities of government, especially the Ministry of Water Resources and Meteorology (MOWRAM), PDOWRAM, donors, local authorities (LAs), Farmer Water User Communities (FWUCs) and farmers, need to be clear.

Participatory Irrigation Management and Development (PIMD) is being introduced in recognition of the need for greater community participation to improve the performance of irrigation systems.[1] In the context of Cambodia, PIMD suggests that FWUCs assume the primary responsibility and authority to manage, repair and improve existing irrigation systems, and to promote and guide the development of new irrigation systems. PIMD is accepted as a national policy in Cambodia and a core strategy to promote participation by farmers in the management of irrigation schemes.[2]

The sustainability of irrigation management relies mainly on the performance of farmers and FWUCs, with technical and financial assistance from concerned institutions such as MOWRAM, PDOWRAM, donors and civil society organisations (CSOs). Village level findings indicate, however, a significant disparity between the FWUC's formal mandate and its actual effectiveness. Although FWUCs have been granted legal and administrative responsibility for managing irrigation schemes, the way that this has been implemented means that most farmers do not feel a strong sense of ownership over the projects/schemes, and continue to seek LAs' and PDOWRAM's assistance to solve their water issues. The perception that the schemes are not fully functional also makes it difficult for the FWUCs to collect irrigation service fees (ISF) necessary for the scheme to remain operational. The lack of community ownership over irrigation schemes is exacerbated by a perceived lack of legitimacy of the FWUCs, caused by difficulties and delays with their registration. Also, despite being independent organisations with a mandate to coordinate and facilitate local water-related issues, FWUCs are hampered by the fact that they do not have conflict resolution powers. FWUCs have to coordinate and negotiate with LAs, government institutions and other external organisations in order to carry out their basic functions.

A range of stakeholders have financed the development and management of irrigation systems, but sustainable financial arrangements to support the operation and maintenance of these systems are still lacking. From 1979 to the present, large amounts of funds from the national budget, bank loans and donor funds have been directed to rehabilitate, construct and maintain irrigation systems, establish flood protection dykes and install pumping stations. Financial sustainability of water service delivery should be achievable because the service to identified users is levied. Many FWUCs report, however, that the ISF does not cover the cost of operation and maintenance (O&M). To solve this, the FWUCs have sought financial support from the government, especially from MOWRAM and PDOWRAM, as well as various funding agencies. This has led the government to encourage the private sector, NGOs, international organisations, development partners and donors to invest in and develop small, medium and large scale irrigation systems and pay for their O&M.

Better management of water resources in a river basin context requires effective water governance policy reflecting accountability, transparency, equity and public participation, with a strong commitment from all stakeholders. An improved water governance system developed under the existing legal framework at river basin level would, in turn, support the capacity of FWUCs, LAs and local institutions to sustainably manage water resources in a wider social and environmental context.

The implementation of IWRM, PIMD, Irrigation Management Transfer (IMT)[3] and the formation of the FWUCs needs to be undertaken carefully at local level taking into account the

---

1 Deputy director of FWUC Department, MOWRAM: Workshop Handout from the National Workshop on Lessons Learned and Resolution on PIMD, organised by CEDAC held at Phnom Penh Hotel on 17 December 2009.

2 FWUC Department, MOWRAM, Cambodia

3 IMT is set under the Policy for Sustainability of Operation and Maintenance Irrigation Systems, MOWRAM Declaration No. 306, 20 July 2000 (ch. 2.2, p. 4).

existing political, cultural, socio-economic and physical features of each specific area. The coordination and decentralisation work in local communities, however, remains slow, particularly in the water governance sector, and will need to improve over a period of time if it is to reach its desired goals. In many areas of the Tonle Sap Basin (TSB), local people and communities still rely on the coordination or support of local political hierarchies, such as the commune councils (CCs), district governors and concerned institutions, to make important decisions. The Technical Working Group on Agriculture and Water (TWGAW) also acknowledges that some of the functions of stakeholders are poorly coordinated and there are gaps and overlaps in functions which need to be remedied within the present public administration reforms.

In addition to the need for an improved coordination structure and a more accountable governance system, considerable investment is also needed to improve the physical infrastructure of existing irrigation schemes. The irrigation systems will not be technically and financially feasible unless they are fully operational and provide real and timely profits to farmers.

Recommendations

As part of the participatory approach to this study, stakeholders were asked to propose practical solutions that could address their concerns. They described the need for greater technical support and greater clarity at local levels about the role and nature of IWRM and its relationship to other policies such as Decentralisation and Deconcentration (D&D) and PIMD. Although these policies have been implemented at national level, they have not yet been fully implemented in local communities. Successful implementation of these national initiatives is dependent on the strength of local governance structures, local leadership, management capacity and technical expertise.

The research has arrived at the conclusion that there needs to be some kind of structure to improve coordination at catchment or provincial level which could also increase the technical expertise available to support FWUCs, line agencies and other groups without removing their authority to make decisions about their own resources. On the basis of the stakeholder responses, this paper outlines a new coordination structure at sub-national level, which is referred to as the Irrigation and Catchment Management Sub-committee (ICMSC).

There are a number of different forms that the sub-committee could take. To stimulate informed discussion and allow for flexibility, the recommendations below explain the aims and functions of the sub-committee and identify the key options and considerations to setting up said sub-committee. The considerations ensure that past lessons inform the development of the new structure and that the changes support rather than duplicate existing structures or resources. It is also to stimulate discussion towards a consensus about how the proposed sub-committee can be given an effective mandate and remain transparent without diminishing the important local role and authority of the newly established FWUCs.

These policy recommendations were discussed during the community level consultations and refined through a series of provincial level workshops with farmers, FWUCs and representatives from PDOWRAM. They aim to address fundamental issues relating to the local implementation of D&D policy and IWRM as identified in the stakeholder analysis.

Recommendation 1: Irrigation and Catchment Management Sub-committee (ICMSC)

Create Irrigation and Catchment Management Sub-committees (ICMSCs) at sub-national level to support the coordination of FWUCs, provincial departments and LAs in making decisions on integrated water resources, planning, development and management at catchment level. The sub-committee would assist in building a common understanding among FWUCs, LAs, and provincial departments about IWRM and D&D policy and support the spatial integration of upstream and downstream communities. They would provide a basis for the development of the new governance structures anticipated under the government's River Basin Management Policy.

Functions of ICMSCs

The ICMSCs would:

- Promote 'bottom-up' processes for small and medium scale irrigation scheme management and development projects within a river basin context taking into account the principles of IWRM, the interests of all stakeholders and the sustainability of natural resources;
- Collaborate with concerned institutions (MOWRAM, MAFF, PDOWRAM, PDAFF), CSOs, provincial governors, LAs, academic and research centres (CDRI, the Institute of Technology of Cambodia (ITC), the Royal University of Phnom Penh (RUPP), the Royal University of Agriculture (RUA), foreign universities) and donors (Asian Development Bank (ADB), Agence Française de Développement (AFD), the World Bank (WB), Japanese International Cooperation Agency (JICA)) to seek technical and financial support;
- Provide an avenue to channel additional technical expertise, including inter-disciplinary advice from different provincial departments, NGOS, donors and external experts on hydrology and IWRM so that the sub-committee may function as a 'service centre' for the FWUCs;
- Offer a forum to raise funds and receive advice from NGOS and donors;
- Provide an opportunity to resolve conflicts between schemes and for FWUCs to jointly plan their cropping and harvesting activities through an informed process based on hydrological and social knowledge;
- Conduct monitoring, evaluation and impact assessment of water related activities, water policies and the effectiveness of sub-committee activities using a participatory approach.

Considerations

In determining the governance structure of the ICMSC, careful consideration should be given to the following:

- *Lead agency and sub-committee members:* Determining the appropriate government agency and level to lead the sub-committee is important. Consideration should be given to whether it is best managed at provincial or catchment level, and whether a given line agency should chair the sub-committee or whether this would be best done by the provincial office, taking into account the government's national policies on IWRM and D&D reform.

- *Mandate and authority:* The sub-committee needs a full and effective mandate but one that is transparent and does not usurp the decision-making powers of FWUCs and other relevant agencies. Mechanisms for downward accountability are important so that the FWUCs are represented, are able to access the technical and financial support that is channelled through the sub-committee, and are able to call on the sub-committee to exercise authority when negotiation, arbitration and coordination between FWUCs is required. It may be necessary for the sub-committee to have an advisory role rather than full authority in deciding on water allocation at scheme and catchment level, so that local communities retain ultimate control over key decisions.[4]
- *Variation between catchments and schemes:* Situating the sub-committee at a provincial/ catchment level provides a more context-specific structure in which FWUCs, LAs and provincial departments could muster the authority to make decisions about water resources and irrigation. However, in each location the sub-committee may take a different "shape", depending on the nature of the catchment and the capacity of existing stakeholders. The structure of each ICMSC will depend on the capacity/ expertise in each location and may need to be tailored to individual catchments depending on whether they appropriately overlap with provincial government jurisdictions.
- *Further stakeholder consultation:* A sub-committee should only be established once there has been a process of joint study, action or consultation. They should not be imposed simultaneously as "shells" without underlying stakeholder involvement. The establishing of a sub-committee requires facilitation which is integral to their success.

Recommendation 2: Education and Training

Provide training to local stakeholders, especially PDOWRAM staff, commune councils, farmers and FWUC committee members on important laws and policies, so that they are aware of their rights and duties when using natural resources. The training should cover:

- Water, Forestry, Fishery, Land and Environment Law;
- D&D and PIMD policies;
- Organic Law[5];
- Administrative regulations and guidelines.

Recommendation 3: Building Local Management Leadership and Capacity

Build the capacity of FWUC committees and commune councils so that they manage their resources properly and are able to lead their communities well. Greater capacity is needed in relation to:

- Leadership, facilitation and communication skills;

---

4 The stakeholders who supported the introduction of a new sub-committee to manage water resources at catchment level included farmers, FWUCs, LAs (village and commune leaders, district governors, provincial officials and the deputy provincial governor), government institutions and NGOs who participated in the provincial workshops conducted in Pursat, Kampong Thom and Kampong Chhnang provinces from February to April 2010.

5 Law on the Administrative Management of the Capital, Provinces, Municipalities, Districts and Khans, RGC 2008

- Budget allocation and financial management;
- Natural resources management;
- Project development and management;
- Irrigation and farming systems.

Recommendation 4: Improving FWUC Accountability

Improve FWUC and LA accountability through strong organisational coordination. FWUC committees have to work according to the roles and duties set in its statute, despite the limited support funds. Key areas to take into account include:

- Encouraging farmers to be aware of the importance of ISF and to satisfactorily participate in O&M for sustainable irrigation systems;
- Informing and engaging farmers to participate in irrigation management and development early and at every stage;
- Expanding the profit of irrigation to farmers by seeking new suitable technology for water management and agricultural extension so that farmers get more products and income;
- Providing timely water and agricultural information and engaging farmers to value common interests.

Considerations

Some FWUCs have raised the issue that if the scheme infrastructure and management capacity are not improved to meet farmers' expectations regarding the availability of water through the scheme, then there may be additional difficulties in increasing accountability, compliance and participation.

Recommendation 5: Greater Coordination of the Tonle Sap Basin

Decentralisation in water resources management cannot be achieved if stakeholders, especially farmers, are not well informed and do not participate in protecting and maintaining their common property. Some important issues that LAs and concerned institutions within the Tonle Sap Basin should consider are:

- Working towards a shared understanding of D&D and PIMD principles among stakeholders;
- Delegating appropriate levels of responsibilities such as planning, implementation, management and decision making in water resources management and development to local level communities (FWUCs), CSOs, and the private sector, etc to increase local involvement;
- Allocating operational and administrative funds to support local level community functions including accountability and financing or co-financing; and
- Reforming and improving stakeholder participation at the Tonle Sap Basin level, beyond the sub-committee members, by increasing coordination with local communities, CSOs, private sector and provincial line agencies to prioritise critical and urgent issues and provide a timely and reasonable response to them.

Recommendation 6: Proposed Further Research

The case studies and workshops in the three provinces suggested that the integration of CC members in the structure of the FWUCs (as FWUC committee members) would help to maintain the legal functions and operation of the FWUCs. Some local stakeholders mentioned that this integration may also build up the role and accountability of the FWUC committees by:

- Empowering FWUCs in their irrigation management roles;
- Facilitating and coordinating with key relevant stakeholders;
- Enhancing the sharing of information on water and agricultural policy;
- Improving the quality of planning and decision making in investment /development projects; and
- Reducing potential conflict between LAs and increasing public trust and participation.

In the above regard, future research could address the following:

- How can FWUCs and CCs improve farmer participation or community-based approaches in water resource management to ensure the sustainability of irrigation schemes?
- In the context of irrigation and catchment governance, how can PIMD and D&D policies be adapted and implemented effectively?
- How can government-donor-community-private sector partnerships in irrigation water management be developed? What are the most effective mechanisms to strengthen such partnerships?
- Should CC members be included in the management structures of FWUC committees to provide technical support and authority?

1

Introduction

1.1. Background

Cambodia is a country rich in water resources, and is highly dependent on these resources for the economic mainstays of agriculture and fishery for the majority of its population. The country faces numerous challenges in developing, managing and conserving water resources in order for these to be used effectively, equitably and sustainably. Irrigation development and the management of water resources in the catchment context[6] present serious governance challenges for many stakeholders including farmers, government agencies, the private sector and a range of development organisations.

There are multiple claims on water as a "shared resource" or a "common-pool resource". At the same time, there are many levels of authority involved in managing and making decisions regarding water resources development and water allocation. Various government institutions, which sometimes come into conflict over water resources, are also required to work together to negotiate outcomes.

Cambodia has specific sets of formal arrangements on how different stakeholders will influence the development, use and conservation of water resources. Well functioning governance arrangements critically need common understandings on stakeholder roles and responsibilities, but these arrangements may not necessarily be understood in the same way by different players. As in many countries, the practices of different stakeholders and the relationships between them often depart from the formal arrangements in place.

Water governance involves a wide range of public, private and community level actors or stakeholders. Governance is a relatively recent term, and its exact provenance is rather unclear (Cleaver & Franks 2005). The United Nations Economic and Social Commission for Asia and the South Pacific (UNESCAP) defined governance as the process of decision-making and the process by which decisions are implemented (or not implemented) (UNESCAP 2009). One study identified governance as the power dependent relationships between institutions involved in collective action (Stoker 1998). But with globalisation and democratisation occurring at various scales, the involvement of the private and third sectors in areas of policy-making and service provision, and the empowerment of CSOs, has called into question the traditional role of governments to order the daily life of its citizens. All these challenges have called for a rethinking of relationships and decision making processes in society, as reflected in the emergence of the new term 'governance' (Cleaver & Franks 2005).

In this study, "water governance" refers to the ways in which power is organised, shared and negotiated in society, the interactions and processes involved in deciding how water resources are to be developed and used, and the distribution of benefits and risks. This includes the full spectrum of influences from shaping agendas and deliberating options, to the design of institutions and organisations, through to the way that these are implemented in the practices of day-to-day water management. Governance is therefore not solely the domain of the State nor is it confined to a particular scale or arena; it emerges from the interactions between State, business, and not-for-profit players at multiple scales.

---

6 That is, within the natural supply constraints and complex interactions that exist between interconnected parts of hydrological and other ecological systems.

Regardless of which definition is chosen, it is evident that concern for stakeholders occupies a central role in the concept of governance and the establishment of management processes. Developing good governance structures suggests a need to understand the reality and the complexity of different stakeholder interests and relations, to evaluate and predict impacts, and assess human capacity. This paper is an analysis of the stakeholders involved in water governance in the context of irrigation and catchment management in order to generate information about:

- Individuals, groups and institutions that will be affected by and should benefit from the management of water and related resources (including fisheries); and
- Individuals, groups and institutions that can influence and contribute to the management of water and related resources.

This paper seeks to analyse stakeholder roles, relationships and views on water resources management in Cambodia, with a specific focus on irrigation and catchment management. The analysis is also designed to examine the degree of consistency or disparity between different stakeholders, and between formal stakeholder roles and actual practices. It also offers a set of policy recommendations to assist decision makers.

1.2. Research Questions

This research addresses three main research questions:

1. Who are the key stakeholders relevant to water resource governance in Cambodia and what are the formal coordination mechanisms and arrangements between them?
2. What are the key stakeholder roles, relationships, and perceptions in the existing water governance arrangements, and how consistent are these among different stakeholders at different levels?
3. What are the consistencies and inconsistencies between formal stakeholder roles and actual practices?

Research Methodology – Multi-scale Stakeholder Analysis

This research employed a step-wise analytical process[7] to draw insights from empirical data and built on reflections concerning current thinking about water governance. It involved key informant interviews with multiple stakeholders, field observations, focus group discussions (FGDs) and provincial research dissemination workshops. The analysis has three main purposes:

- To draw out the main issues on water governance in Cambodia and to pinpoint and resolve existing knowledge gaps;
- To examine water-related institutions and stakeholder agencies in order to gain a clear understanding of their current capacity and potential;
- To frame the research in a way that assists public policy decision makers to compare and evaluate policy alternatives.

2.1. Key Stakeholder Identification and Position Determination

The groups and players that have a stake in each of the functions and uses of the water resources were identified by asking the following questions:

- Who benefits from the use of the resource(s)/targeted schemes?
- Who has rights and responsibilities over the use and management of the targeted resource(s)/ schemes?
- Who controls the targeted schemes or makes decisions that affect the use and status of the resource(s), and who does not?

A typology of stakeholders was developed to enable the selection and prioritisation of stakeholders. This typology is based on the power (influence) of the stakeholders, the legitimacy of their interests, and the urgency of their claims.[8] Its added value especially lies in providing insights to the positions of stakeholders regarding the water governance and management process. The outcomes of the stakeholder position analysis are then synthesised and presented in a diagram and matrix format to allow for the identification of the key issues that need to be addressed during planning.

2.2. Data Collection

2.2.1. Key Informant Interviews

To facilitate stakeholder analysis, semi-structured stakeholder interviews were conducted across multiple locations and scales at national, sub-national and local levels. The specific purpose and focus of the stakeholder interviews was twofold: first, to ascertain the stakeholders' self-understood roles and expectations about water resource management in irrigation development; and second, to learn about their experiences in working with other key players in the framework of water governance in Cambodia.

---

7 This approach is based on the step-wise analytical process described by Hatfield Consultants. Step 1 involves a literature review on the existing institutional arrangements related to water management. In Step 2, a list of stakeholders is created and those with an interest are identified. In Step 3, stakeholder positions are determined and roles are assigned based on stakeholder type (viewed on 18 January 2010 at http://www.popstoolkit.com/riskmanagement/module/step3/implementationplanning/stakeholders.aspx)

8 These concepts are further explained in the literature review section.

The interviews also sought to determine the consistency of understandings of key aspects of water governance among the agencies most involved. The interview process followed a semi-structured approach, with a set of guide questions adapted to the specific roles, expectations and experiences of each individual or organisation (Appendix A1). The questions were used to steer the discussions, rather than as literal and rigid interview questions. This method was designed to adapt flexibly to the particular priorities and concerns held by stakeholders at different levels of authority.

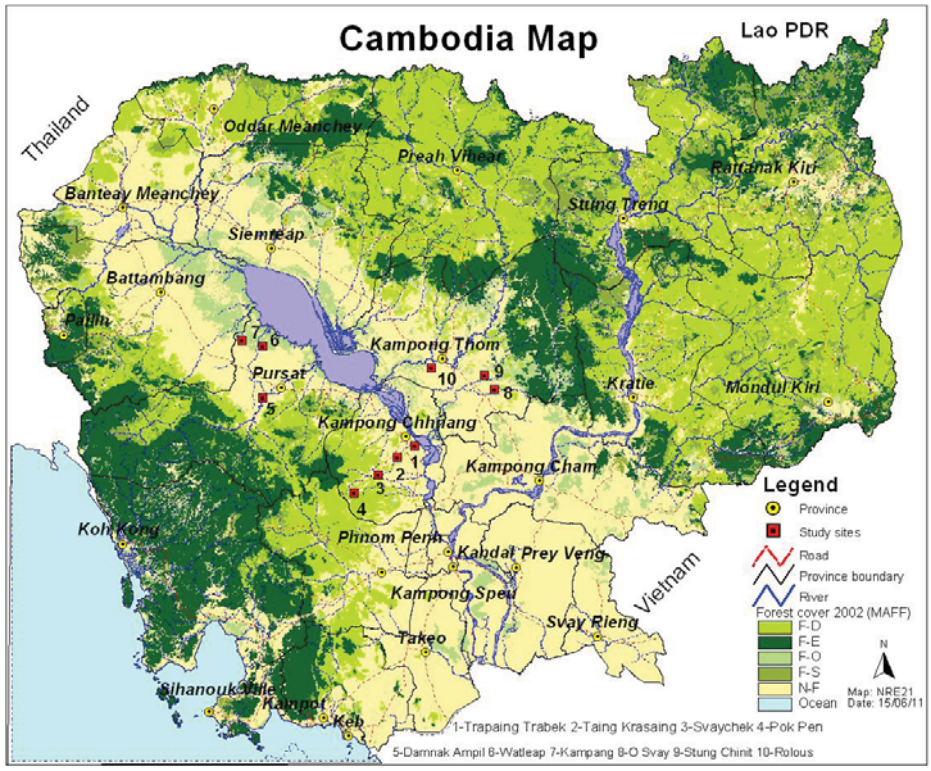
The interviews were conducted individually and through FGDs. Key informants identified for interviews and discussions included governmental agencies, donors, academia, CSOs (NGOs, farmers, FWUCs), village leaders and commune councillors. Appendix A1 also presents the list of key informants who participated in this research.

2.2.2. Field Observations and Focus Group Discussions

Field observations and FGDs were conducted in ten irrigation schemes across three provinces in Cambodia (Figure 1). The selection of study sites was based on their relative upstream and downstream locations and their diversity in terms of scale and configuration of the different schemes. These ten study sites are:

- Four schemes in Kampong Chhnang province: Trapaing Trabek, Tang Krasaing, Svay Chek and Pok Pen;
- Three schemes in Pursat province: Wat Leap, Kampang and Damnak Ampil;
- Three schemes in Kampong Thom province: O Svay, Steung Chinith and Rolous.

Figure 1: Map of Study Sites



Source: NRE, CDRI 2008

The FGDs involved semi-structured questioning and discussion of water management issues. The settings of the FGDs were designed to produce different insights and to see how farmers would respond in a collective environment, with or without village chiefs/FWUC members. Additional field observations were conducted alongside the FGDs in order to establish a more comprehensive picture of the physical infrastructure and dimensions of the irrigation schemes.

2.2.3. Provincial Workshops

The data collection method was further supplemented by a series of provincial research dissemination workshops organised in Kampong Chhnang, Kampong Thom and Pursat provinces in 2009 and 2010. The workshops were organised through Participatory Impact Pathways Analysis (PIPA)[9] which is designed to inspire participants to identify the key constraints and challenges they are facing in water use and to collectively consider the appropriate ways to settle them. The results of the initial research were discussed, and further advice and feedback was sought from provincial, district and commune stakeholders.

The participants were divided into three key groups: the first group consisted of concerned provincial departments such as PDOWRAM, PDAFF, the Provincial Fishery Administration (PFiA) and the Provincial Department of the Environment (PDOE), as well as NGOs; the second group comprised local authorities (a provincial authority representative, deputy and district governors, commune leaders and CC members); and, the third group included farmers and FWUCs. As an arena for stakeholder cooperation, the workshops were structured to assist participants to jointly identify and prioritise: 1) key issues in irrigation management; 2) visions and solutions for the identified key issues; 3) key stakeholders and their responsibilities in irrigation management; 4) strategies and research required to achieve the expected results; and 5) advice to assist the development of irrigation/water allocation guidelines within the catchment context.

This method also enabled the study team to offer stakeholders various insights into irrigation management and improved water use and water governance in their local areas.

9 Boru D., Sophie A., Graham T.H. and Ronald M. (2008) refer to PIPA as a practical planning, monitoring and evaluation approach developed for use with complex projects in the water and food sectors. It begins with a participatory workshop where stakeholders make explicit their assumptions about how their project will achieve an impact.

Rice field in Damnak Ampil Scheme

Literature Review

The literature review was conducted to define and discuss "stakeholders" and "stakeholder analysis": first as discrete concepts; and second, as they relate to important water governance themes of participation, coordination and Integrated Water Resources Management (IWRM).

3.1. Current Consensus on Stakeholder Definitions

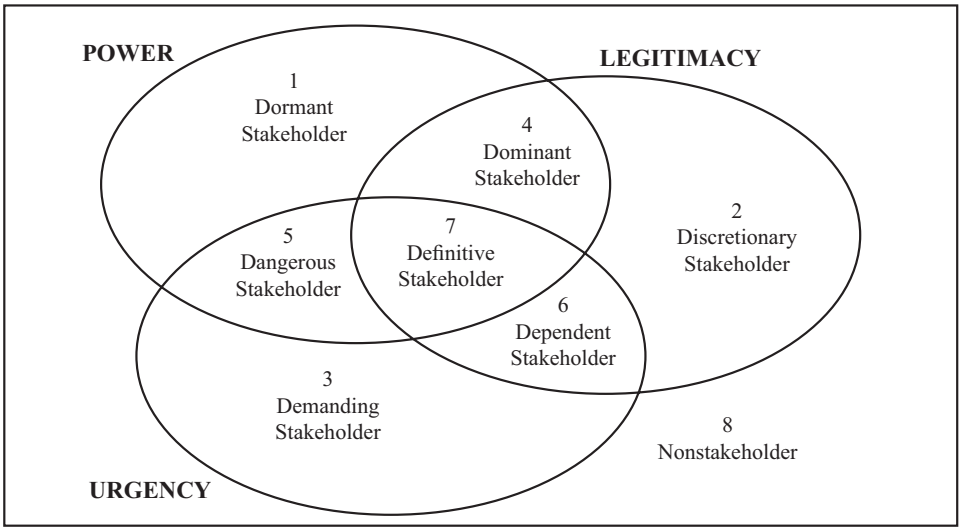
The concept of '***stakeholder***' has numerous definitions in the literature.

Bryson (2003) emphasised that the concept of stakeholders has a long history and broad applicability. For example, as early as 1708 the term meant "a person entrusted with the stakes of bettors" who must deliver the stakes to the winner of the contest (Merrian-Webster Collegiate Dictionary, 10th Edition, 1998). Later, a second meaning was added, so that a stakeholder became "one who has a share or an interest, as in an enterprise" (American Heritage Dictionary of the English Language, 4th Edition, 2000).

While canvassing various typologies – such as active and passive stakeholders, or primary and secondary stakeholders – Grimble and Wellard (1997) acknowledge that such dichotomies are rarely absolute. For example, in the context of agrarian Southeast Asia, small farmer groups will often be involved as both active allocators and passive recipients of irrigation water. In light of this complexity, stakeholders are probably better understood in a *relational* sense, with each stakeholder mapped according to their *comparative* influence (power) and interest (extent of being affected) within a certain system. If interest groups see that their interests are threatened, they will use their power and influence to prevent other group objectives from being achieved (FAO 1997). Knowing the interests of different groups can lead to successful planning and implementation of activities.

In this vein, the seminal paper of Mitchell *et al.* (1997) extracts three variables for identifying and prioritising key stakeholders: the ***power*** of the stakeholder, the ***legitimacy*** of their interests, and the ***urgency*** of their claims. Figure 2 theorises the relationship between these variables.

Figure 2: Stakeholder Typology – One, Two or Three Attributes Present



Source: Mitchell *et al.* 1997

Within this typology, legitimacy, power and urgency can also intersect or be combined in multiple ways and be considered simultaneously so that "power gains authority through legitimacy and it gains exercise through urgency" (Mitchell *et al.* 1997). When applied to key stakeholder relationships in water governance systems, this framework has the potential to shed light on (and to an extent, explain the foundations of) the different perspectives held by small farmers, provincial managers and national bureaucrats.

The eightfold classification depicted in Figure 2 conceptualises:

1. 'Definitive' stakeholders as those who possess all three attributes of power, authority and legitimacy and those who will therefore receive the greatest attention;

2. 'Dominant' stakeholders, the next in rank who possess power and are perceived to have legitimate claims; the 'dependent' stakeholders whose claims are deemed legitimate and urgent; and the 'dangerous' stakeholders who possess power and have claims that are urgent but not legitimate.

3. 'Dormant' stakeholders, the remaining less salient groups which are powerful but with claims that are deemed neither urgent nor legitimate; the 'discretionary' stakeholders, who have legitimacy, but are without power or urgency, and the 'demanding' stakeholder groups which have urgency without power or legitimacy and lastly, the 'non-stakeholders' who have none of these claims (Mitchell *et al.* 1997, cited in Chevalier 2002).

In this working paper, 'stakeholders' are the group of actors who share an interest in any particular economic, social or environmental system. Consistent with the holistic underpinnings of stakeholder analysis, stakeholders may come from any level of society: from government and multinational agencies, to grassroots networks and individual citizens (Grimble & Wellard 1997). Similarly, the shared interests in question may operate on a global, regional, local or household scale.

3.2. Stakeholder Participation in Evolving Concept of Water Governance

In recent years, stakeholder participation has become a prominent theme within the social research and development policy discourse. While the recent shift towards "water governance" implies a more inclusive and comprehensive form of stakeholder participation, the depth and extent of this change is questionable. Community participation in the design process and the existence of arrangements to monitor the management of the system are associated with the success of collective action and performance of the water system (Isham & Satu 1998).

Cooke and Kothari (2001) expressed that it is not enough to follow the formal procedures and technical guidelines of a "participatory approach to development" – it is also necessary to consider the very important social dimensions of decision making equally, and that participation should occur *at all stages* of the process (Bagadion & Korten 1991). For example, farmers are key stakeholders who should be able to influence the initial design of irrigation systems, rather than merely participating in the subsequent O&M of systems imposed by external experts (see, for example, Ostrom 1992). On a larger scale, formal institutions for water governance should similarly be developed with community participation at all stages.

Participatory (or bottom-up) approaches (such as beneficiary consultation, participatory planning, NGO engagement, and beneficiary group formation) have been developed and applied worldwide in response to the perception that top-down and supply-driven approaches are the cause of the problems (ADB 2009a:1).

Cambodia's emerging water law – which has been drafted with expert assistance and international funding – may benefit from a greater adherence to this approach. To achieve meaningful stakeholder participation, the literature suggests various approaches that may be relevant to the Cambodian context, and will be tested against the findings presented in this working paper. For instance, the methods of stakeholder engagement may need to be better tailored to work within pre-existing social and political networks such as Cambodia's commune councils and community-based resource management organisations.

3.3. IWRM and Stakeholder Participation in Literature and Practice

The concept of IWRM has been developed into practical guidelines by a series of international key documents such as the 1992 Dublin Statement, Chapter 18 of Agenda 21 of the "Rio Earth Summit" (UNCED 1992), and the Plan of Implementation of the 2002 World Summit on Sustainable Development. As these international declarations and guidelines accumulate, a common principle of "subsidiarity" is emerging:[10] that water management should be decentralised to the lowest appropriate level. Implicit in this idea is a level of "bottom up" decision-making autonomy, rather than simply an imposed top-to-bottom hierarchy of delegated responsibilities.

To achieve efficient, equitable and sustainable water management within the IWRM approach, a major institutional change will be needed. Both top-down and bottom-up participation of all stakeholders will have to be promoted – from the level of the nation down to the level of a village or a municipality or from the level of a catchment or watershed up to the level of a river basin. The principle of subsidiarity, which drives down action to the lowest appropriate level, will need to be observed. (Global Water Partnership 2000:33).

With a view to enabling this deeper extent of coordination and decentralisation, influential sources cite stakeholder capacity building as a necessary supporting strategy. For example, the Global Water Partnership (GWP 2000: 50) presents capacity building as a way of "empowering and equipping people and organisations with appropriate tools and sustainable resources" to solve their own water problems.

Key existing literature shows that Cambodia's IWRM landscape is still evolving, and various agencies have overlapping and poorly defined water management responsibilities and jurisdictions. In this context, self-interested stakeholders may be suspicious of horizontal and vertical integration policies, perceiving them as attempts to redistribute power in pursuit of particular ends. For example, the development of the Tonle Sap Basin Management Organisation (TSBMO) was seen by relevant ministries as "a threat to their jurisdictional responsibility and power" (Grace 2009: 42) and has subsequently been replaced with the Tonle Sap Authority (TSA). One reason for the complexity of the Tonle Sap's management stems from the differing perspectives that actors at different levels – local, national, regional and global – have towards the Tonle Sap and its resources (Keskinen & Sithirith 2009). In essence, individual stakeholder interests (in maintaining their own power and relevance)

10 Garfield (1998) referred to "subsidiarity" as transferring specific functions to local community groups, including delegating control to grassroots entities to plan and implement extension programmes (Garfield 1998, cited in WB 2004; 2).

do not necessarily match Cambodia's collective interest in a coordinated and appropriately scaled water governance regime. Mitchell (1990: 14) offers a further perspective on this problem, arguing that "vertical and horizontal fragmentation creates an environment in which rewards usually accrue to those who concentrate upon, indeed defend, their own areas of interest".

3.4. Conceptualising Stakeholder Analysis: What is it, and how is it useful in Natural Resource Management?

There is a growing literature on stakeholder analysis and its importance. Stakeholder analysis encourages a more holistic and systematic framing of problems and responses, especially in situations where there are a diverse array of potentially competing interests. In their key contribution to the theory, Grimble and Wellard (1997: 175) define stakeholder analysis as:

> *...a holistic approach or procedure for gaining an understanding of a system, and assessing the impact of changes to that system, by means of identifying the key actors or stakeholders and assessing their respective interests in that system.*

In a practical sense, this means that state or non-state decision-making should be always guided by an assessment of the different interests, perspectives and interactions between relevant stakeholders.

The stakeholder analysis approach is particularly applicable to natural resources management (NRM), which typically involves a diverse array of interested parties from multiple levels of society, and requires a balancing of equity, efficiency and environmental sustainability (Grimble & Wellard 1997). The issue of water governance illustrates this point. In order to manage the multiple uses and users of water, the existence of uncertain or shared access rights, and the spatial and temporal trade-offs involved, stakeholder analysis is an appropriate and useful starting point to identify and map the various stakeholder interests.

Nevertheless, a stakeholder analysis approach to governance has its limitations. Stakeholder analysis is not a substitute for sociological understanding, political or legal analysis. Edmunds and Wollenburg show how stakeholder-based forums can easily become ways of dealing with relationships that are inherently unequal as if there were simply a technical problem to be solved, marginalising poorer and weaker groups (Edmunds & Wollenburg 2001).

Stakeholder analysis can too easily slip into a descriptive exercise of formal actors and roles. Of course, real world social and institutional relationships are far more complex, and unless stakeholder analysis takes account of cultural practices and power relations that depart from the formal stakeholder roles dictated by governance decrees, it will fail to contribute to an understanding of how governance actually operates – successfully or otherwise.

Stakeholder Analysis

This section provides baseline information on current technical arrangements at different levels including scheme and catchment levels, and sub-national and national levels, as reported by key stakeholders whose roles are closely involved in Integrated Water Resources Management (IWRM) and Participatory Irrigation Management and Development (PIMD). It serves as a benchmark for assessing the state of implementation of IWRM or PIMD. It also identifies a range of inconsistent issues that have arisen from the analysis of stakeholder self-reported roles and practices. These issues will be discussed in the next section.

4.1. Overview of Stakeholder Landscape in Study Areas

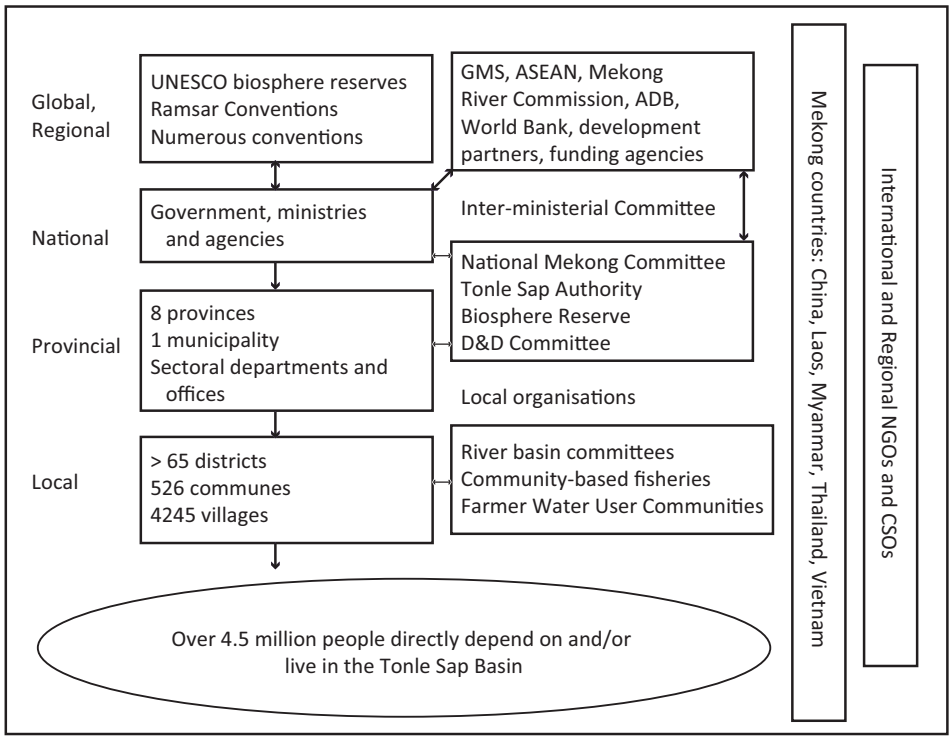
Cambodia is a low lying country and most of the population (approximately 80 percent) lives in rural areas and more than 70 per cent of the country's labour force depends on the agriculture sector (NIS 2008) The country is rich in water resources; surface water in the eastern part is supplied by the Mekong River while the Tonle Sap River and its catchment supply the central and western parts.

Like many water basins, the governance of the Tonle Sap Basin (TSB) is complex and characterised by multiple dimensions, raising the question of whether such a system can, in any reasonable way, be managed comprehensively, at least by a single institution (Sokhem & Sunada 2006: 400). The four main categories for the multidimensionality of the TSB and the entire Mekong Basin are:

1. Multi-jurisdiction: six countries in the Mekong River Basin and eight provinces in the TSB;
2. Multi-scale: multiple interests, needs and challenges at community, sub-catchment, basin, regional, national and global scales;
3. Multi-perspective: different economic, political, and social objectives and unequal financial and technological capacities define perspectives that vary from country to country, province to province, by resource sector, socio-political actors and scale of orientation;
4. Multi-disciplinary: numerous disciplines and points of view (policy makers, planners and developers, the scientific community and other stakeholders).

Many key players—riparian countries and their government agencies, basin communities, Civil Society Organisations (CSOs), the private sector, funding agencies and development institutions—have a legitimate interest in the governance of the TSB (Sokhem & Sunada 2006: 400). Figure 3 highlights the busy landscape of key stakeholders in the TSB.

Figure 3: Key Stakeholder Landscape in the Tonle Sap Basin



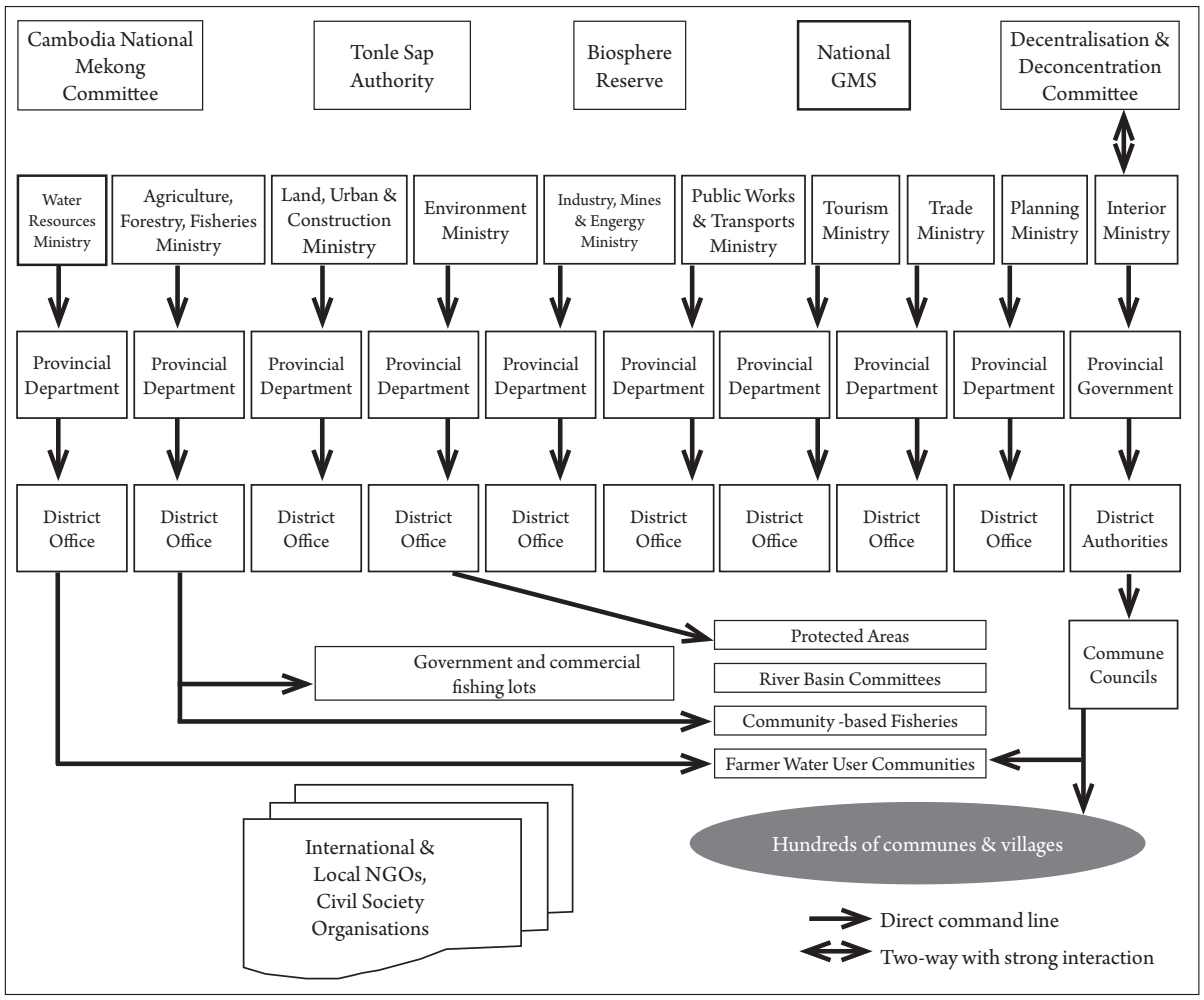
Source: Sokhem 2010

4.2. Stakeholder Self-reported Roles in Water Resource Management

4.2.1. Stakeholders at National Level

The study areas for this research are in the Tonle Sap Basin (TSB). Most of the Cambodian population live and work in rural areas and depend on rice production as their primary source of livelihood. Water is a key sector for increased agricultural production. In Cambodia, water-related issues are handled by several ministries and committees with their specific mandates, ambitions and policies. Many international, national and local CSOs are working to improve water resource management issues in Cambodia. Many different institutions and stakeholders claim jurisdiction over the TSB, including MOWRAM, MAFF, the Ministry of the Environment (MOE), the Ministry of Transport, and the Ministry of Industry Mining and Energy (MIME), etc (Figure 4). The institutional arrangements and governance of the TSB are shaped by its ecological complexity and by local, national and regional perspectives.

Figure 4: National and Local Stakeholder Landscape



Source: Sokhem 2010

The formal governance system is challenged by the lack of a proper feed-back mechanism and coordination among concerned institutions (Keskinen & Sithirith 2009). Also the functioning of vertical links between the central government, provincial and local authorities and villages requires urgent improvement. An additional challenge is the aid dependency of Cambodia's governance system, and the dominance of donors, development banks and international NGOs in shaping government policies and introducing new approaches. Such dominance has also been clearly visible in the Tonle Sap area, including its different management initiatives (Keskinen & Sithirith 2009).

4.2.1.1. Ministry of Water Resources and Meteorology (MOWRAM)

The MOWRAM was officially established in 1999 by the government's proclamation NS/RKM/0699108. MOWRAM is mandated to take the leading role in water-related activities, with the aim of ensuring social and economic development, equitable and sustainable use of water for livelihoods, and enhancement of environmental quality (Phalla *et al.* 2008). A sub-decree issued in 1999 (RGC 1999) formalises MOWRAM's key performance areas, which can be summarised into five major objectives (Phalla *et al.* 2008): 1) water resources management and development; 2) flood and drought management; 3) water-related legislation and regulation; 4) water resources information management; and 5) administration, management and human resources development.

To ensure effective water resources management and to supply sufficient water for agriculture, MOWRAM has been maintaining, rehabilitating and developing a number of irrigation infrastructures and expanding irrigated land areas (MOWRAM 2009a). In compliance with government policy on decentralisation and deconcentration (D&D) and to assure sustainable irrigation management, MOWRAM is implementing a policy of irrigation management transfer (IMT) and PIMD.[11] Within PIMD policy, farmers are encouraged to self-manage irrigation systems.

Aiming at improving its administration and human resource capacity building (ibid), MOWRAM has prioritised capacity building for its staff at all levels by: 1) increasing administration and management capacity through "learning by doing" for MOWRAM staff to cope with national and international standards, and 2) strengthening the capacity of staff at central (key officials) and sub-national levels, as well as FWUCs, in improving the benefits of water in livelihood and economic development.

The Department of FWUCs of MOWRAM is tasked with a leading role in establishing the institutional environment for local FWUCs. The basic legislation to create FWUCs includes Circular No.1 "Legal Framework on Implementation Policy for Sustainable Irrigation Systems" on FWUC creation, with policy guidance on the management of FWUCs, and *Prakas* 306 on the legal and technical framework of MOWRAM. FWUC registration is conducted through MOWRAM's FWUC department. About 350 FWUCs had been created in the period up to 2008, of which 250 were already registered and officially recognised in MOWRAM's FWUC Inventory.

The Technical Working Group on Agriculture and Water (TWGAW) has been established to promote efficient and effective stakeholder coordination (line agencies, communities, donors and NGOs) and to provide technical input into decision-making. Its establishment was compelled by a growing understanding that the water and agriculture sectors are linked to many agencies dealing with social, economic and environmental issues. MOWRAM and MAFF are the lead agencies for implementing five programmes under the Strategy for Agriculture and Water (SAW 2007), namely: 1) Institutional Capacity Building and Management Support Programme for Agriculture and Water; 2) Food Security Support Programme; 3) Agriculture and Agri-business (Value Chain) Support Programme; 4) Water Resource Management; 5) Irrigation, and Land Programme; and 6) Agricultural and Water Research, Education and Extension Programme (TWGAW 2007).

MOWRAM officials have been working closely with line ministries, local authorities, donors, CSOs, local and international NGOs and farmer communities to achieve these formal objectives.

4.2.1.2. Ministry of Agriculture, Forestry and Fisheries (MAFF)

Agriculture is the backbone of the national economy, comprising about 34.4 percent of GDP in 2008 (MAFF 2009). Of Cambodia's 3.78 million ha of agricultural land, 91 percent is under rice cultivation. In 2008, there were 2403 irrigation schemes, in which the average rice yields were 3.2 to 3.5 tonnes per ha (MOWRAM 2009c)

The government's Sub-decree No. 17, dated 7 April 2000, sets out the functions and obligations of MAFF. As far as water and agriculture are concerned, MAFF is mandated to organise and operate policies in the agricultural sector, to improve people's living standards and to co-ordinate and co-operate with internal and external organisations, and non-governmental organisations for the development of the agriculture sector.

11 MOWRAM 2005,Cambodia IWRM strategy and Road Map

MAFF supported the government in developing the policy frameworks to guide agricultural development aimed at poverty reduction and the strengthening of food security. Together with MOWRAM, MAFF is tasked to implement key programmes under the 2007 Strategy on Agriculture and Water (SAW) which involves the coordination of different stakeholders and agencies whose interests and responsibilities relate to agriculture and water (Ibid).

MAFF has also implemented a number of donor-funded projects. To cope with the current world economic situation, MAFF has considered a number of key objectives and measures (Ibid) including: a) improving productivity and diversification of agriculture, ensuring food security for all people, reducing poverty, increasing GDP per capita and ensuring sustainable NRM and conservation through implementing the SAW 2007 five programmes; b) intensifying and diversifying food production by smallholder farming households, particularly those that are currently food insecure; c) accelerating access of smallholders to improved technology, improved agricultural inputs, improved soil quality and water management; d) increasing public investment in physical infrastructure including transportation, irrigation, market facility and agricultural research and extension; e) strengthening community based organisation; f) developing agro-processing and agri-business; and g) developing micro-credit.

The Department of Agricultural Extension (DAE) is charged with contributing to the improvement of food security, rural income and agricultural production in Cambodia. DAE adopts and uses the participatory training and extension approach and methodology for delivering and transferring agricultural knowledge, information and technology including farming system development, farmer organisation development and extension and household food security (Mak 2007).

DAE supports and coordinates PDAFF's provincial office of agricultural extension to provide local level support for district extension staff. For instance, in the Northwest Irrigation Sector Project (NWIP) supported by ADB, PDOWRAM led irrigation development activities and PDAFF provided agricultural extension programmes to farmers. Various participatory approaches were used, such as: participatory assessment and planning, participatory technology development, participatory training and extension, farmer organisation development and household food security.[12]

4.2.1.3. National Committee for the Management of Decentralisation and Deconcentration Reform (NCDD)

The National Committee for the Management of Decentralisation and Deconcentration Reform (NCDD) works to decentralise administrative structures by working with local administration units[13] and to ensure sufficient facilitation and consultation among NCDD, ministries and other national level institutions related to the transferring of functions, power and resources from national to sub-national level.[14]

The NCDD was established to implement the Organic Law of 2008 which brings about significant changes and effectiveness in governance and service delivery through the implementation of a major 10-year reform programme, notably, the Strategic Framework for Decentralisation and Deconcentration (D&D) Reforms. The government expects that *decentralisation and local empowerment would "operate with transparency and accountability in order to promote local*

12 Notes from interview with PDOWRAM, Pursat, in 2010 and with staff from the DAE, MAFF, in 2010
13 Interview with NCDD staff at the NCDD Office, Ministry of Interior, 2009.
14 Royal Decree No. NS/RD/0806/355, dated 18 August 2006, on the establishment of NCDD

development and delivery of public services to meet the needs of citizens and contribute to poverty reduction within the respective areas". [15]

At national level, there are some working-groups dealing with coordination issues, e.g. on planning, decentralisation and deconcentration (D&D), and investment funds. The three components within NCDD include:

- A civil society component to build voices to influence local development plans and establish pro-poor market strategies to support small-scale social organisations[16];
- A forestry, fishery and land component to bring together all sectors and discuss resource management issues within a decentralisation framework;
- A natural resources and environmental management component to develop a coordinated action plan by integrating the action plans of other components aimed at bringing all components to work together effectively.[17]

At the provincial level, the Provincial Rural Development Committee - Executive Committee (PRDC-Excom) plays an important coordination and facilitation role. This body considers financial allocations and other issues before the provincial governor makes a decision. Anecdotal evidence suggests that the PRDC's effectiveness varies from province to province.

The NCDD and commune councils (CCs) reportedly have a good relationship and are working together to select priorities for commune investment projects related to agriculture, fisheries and irrigation (O&M of dams and canals).[18]

4.1.2.4. Tonle Sap Biosphere Reserve Secretariat and Tonle Sap Authority

"The Tonle Sap Biosphere Reserve (TSBR) Secretariat operates under the auspices of the Cambodia National Mekong Committee (CNMC) to coordinate and strengthen cooperation between ministries, agencies, local authorities and communities concerned with the protection and sustainable management of the Tonle Sap Biosphere Reserve" (RGC 2001: 4).[19] The TSBR framework also increased ADB's involvement in the Tonle Sap, leading eventually to the formulation of the ADB's Tonle Sap Basin Strategy in 2003 and the plans for the Tonle Sap Basin Management Organisation (TSBMO) (Keskinen & Sithirith 2009).

The TSBR Secretariat published in January 2007 a policy paper describing the management challenges in the Tonle Sap area and suggested a common framework for policy coordination, putting the TSBR at the centre of the Tonle Sap's management and the TSBR committee, technical advisory groups, provincial working groups and advocacy forums as coordination mechanisms (Keskinen & Sithirith 2009). However, such proposed mechanisms were superseded by the creation of the Tonle Sap Basin Authority under the Office of the Council of Ministers in 2007, renamed the Tonle Sap Authority (TSA) in 2009 under the auspices of the MOWRAM (Keskinen & Sithirith 2009). With the phasing out of donors' support, the sustainability of TSBR is uncertain.

---

15 http://www.ncdd.gov.kh/component/content/article/30-ncdd/5-message-from-the-chairman (accessed on 26 October 2010)

16 This includes FWUGs, money or rice saving groups, and self-help groups for the elderly and antenatal care

17 Interview with NCDD staff at the NCDD Office, Ministry of Interior, 2009.

18 From communication with a provincial technical advisor, NRE and Livelihood Project to Support Democratic Development through D&D (PSDD), at Pursat Province, 2010.

19 Although the TSBR Secretariat was officially established under the CNMC, in practice it has been closely affiliated with the Ministry of Environment, creating confusion about its actual role and mandate.

Even though the TSBR is basically applicable throughout the lake-floodplain area, in practice the Ministry of Environment has full authority only over the core conservation areas. These core areas also partly overlap the fishing lots that are under the control of the Fisheries Administration of MAFF (Keskinen & Sithirith 2009).

Created under Royal Decree, dated 29 June 2009[20], the TSA has an advisory and communication role among all stakeholders and is responsible for coordination, management, conservation and development in the Tonle Sap Basin, and its members include representatives from key line ministries and the governors of eight provinces (RGC 2009).

4.2.2. Stakeholders at Sub-national Level

4.2.2.1. Provincial Department of Water Resources Management and Meteorology (PDOWRAM)

It is noted that increasingly, significant responsibilities for local water resource policy and planning are being delegated to sub-national authorities, such as PDOWRAM. This decentralisation of water management is consistent with the government's wider sub-national governance reform, including the reforms to provincial/municipal and district/*Khan* administrations following decentralisation and deconcentration and the continued commune/*Sangkat* reforms (RGC 2005).

Based on the national Water Resources Policy,[21] many government institutions hold different responsibilities with regard to water; however coordination and cooperation among them are still limited. For this reason, PDOWRAM[34] intends to work within the institutional framework to provide appropriate mechanisms for coordinated water governance and management.[22] For instance, most large scale irrigation development projects are centrally designed by MOWRAM. The project documents are later passed on to the provincial/local authorities, PDOWRAM, concerned provincial departments and local communities to implement at a practical level.

PDOWRAM actively facilitates the FWUC system in two key ways: first, assisting the general allocation and management of water; and second, mediating conflicts that arise from water allocation, water shortage, flood and drought. PDOWRAM attempts to foresee how to improve farmers' water supply and how to engage farmers in taking care of common property such as water, irrigation infrastructure, fisheries and flooded forests. For example, in Kampong Thom province, PDOWRAM prepared a local water working group within a donor funded project to support the FWUC in each scheme, involving government agencies and NGOs, such as the Groupe de Recherche et d'Echanges Technologiques (GRET), the Cambodian Centre for Study and Development in Agriculture (CEDAC), the Cambodia Agriculture Value Chain (CAVAC), Social Business Khmer (SBK Research & Development).

Conflict over water use commonly occurs during periods of water scarcity. A number of stakeholders, such as PDOWRAM of Kampong Thom province, have observed that conflicts relating to water allocation arise from what is perceived to be self-interest and lack of care for common property resources, as illustrated in the following quotes:

---

20 It was later amended by Royal Decree No. NS/RKR/0310/258, dated 24 March 2010.
21 RGC 2004, National Water Resources Policy for the Kingdom of Cambodia, p. 10.
22 Meeting with PDOWRAM director.

...agriculture needs water. During the dry season, while PDOWRAM makes efforts to maintain the water supply, farmers start rushing for water. Conflict over water use occurs because farmers do not compromise or understand each other. They want to be rich and to survive alone...[23]

...up to now, only a few people have been committed to taking care of common property, especially the operation and management of the canals. It has been left to individual willingness. We all have to wake up because is it very hard to get support and funds from donors and the construction of each irrigation system is very costly...[24]

Recognising these issues, PDOWRAM of Pursat province has prepared a mechanism to prevent and settle water use conflicts. This water conflict prevention plan was developed at a local level in order to provide the FWUCs and local authorities with a framework for solving any subsequent water management issues that might arise.

PDOWRAM is one of the most significant agencies involved in the irrigation stakeholder landscape. With the ultimate role of ensuring that farmers have enough water for agriculture, PDOWRAM has taken the role of encouraging cooperation among other provincial departments, NGOs, and the private sector in irrigation management and development. As such, in Kampong Thom, PDOWRAM is reportedly cooperating well with the Provincial Fishery Administration (PFiA) to ensure that farmers have sufficient water and fish for daily consumption.[25]

4.2.2.2. Provincial Department of Agriculture, Forestry and Fisheries

The Provincial Department of Agriculture, Forestry and Fisheries (PDAFF) is said to coordinate activities with PDOWRAM, by providing the necessary agricultural extension that helps FWUCs and Farmer Water User Groups (FWUGs) to improve agricultural outputs and incomes.

MAFF and PDAFF have been trying to encourage farmers to intensify and improve their cropping by taking advantage of better water availability through irrigation. PDAFF from Kampong Thom reported that farmers in some areas of Kampong Thom province have changed the seed and cropping pattern following the PDAFF advice, from long-maturation varieties ("heavy") to medium-maturation variety seeds, following PDAFF advice.[26] However, in the Stung Chinith scheme of Kampong Thom province, farmers continued to use traditional rice cropping practices which provide low yields, as highlighted by PDAFF director, Kampong Thom, that: "... some farmers practice rice cultivation with carelessness. Some other farmers come to us (PDAFF) for assistance. We help them and the result is much improved. ..."[27]. An ADB staff member also argued that "… the production of the demonstration field increased up to 30 percent compared to the traditional method applied by farmers …"[28] Worse still, most farmers did not want to grow dry season rice even where water is available.

---

23 PDOWRAM director's speech at the provincial workshop in Kampong Thom, 23-24 March 2010, PDOWRAM Office.
24 Ibid.
25 Ibid.
26 Interview with PDAFF director, Kampong Thom, 4 January 2010
27 Ibid.
28 Interview with ADB staff at ADB Residence Mission, Phnom Penh

MAFF and PDAFF organised a number of rice growing demonstrations by selecting key farmers and training them or demonstrating to them the improved cultivation techniques in the hope that success would encourage other farmers to follow suit. Farmers who followed PDAFF's advice reported better yields.[29]

> *...the success factor is that the farmers change the seed following PDAFF advice, from heavy to medium seed....*[30]

> *...Farmers who trust PDAFF get better results. We do not wish to give a partial gift to people but want to give them the full gift so they can rely on it – seed, fertiliser, training, and everything...*[31]

4.2.2.3. Local Authorities

The main formal responsibility of the commune authority (the commune and village leaders) is derived from the Law on Commune (*Khum/Sangkat*) Administrative Management (RGC 2001). This law requires commune councils to uphold and support good governance by using all available resources to address the basic needs of people to: maintain security and public order, *s*erve the common interests of citizens in accordance with general national policy; promote social and economic development and upgrade the living standard of citizens; and protect and preserve the environment and natural resources (Articles 9, 41, 43). Moreover, Articles 48 and 49 of this law also provide the commune (*khum/sangkat*) with legislative and executive powers to be exercised through orders (*deika*) made by the commune (*khum/sangkat*) administration and which are enforcible within its territory. In the case of water management, this law mandates commune authorities with the rights to manage water resources and to sanction those who act illegally.

A proclamation from the Ministry of Interior (MOI *Prakas* 1994) provides formal mandate to district and provincial governors to exercise functions such as the administrative police and judicial police to: reconcile civil disputes; impose sanctions on petty offences; coordinate and monitor activities of provincial and municipal officials; and issue licences for commercial, handicraft and business activities according to the national laws (RCG 1994).

Similarly, this proclamation of MOI provides district and provincial authorities with mandates to manage water resources and to sanction those who act illegally, requiring that FWUCs cooperate with such authorities.

4.2.3. Stakeholders at the Scheme Level

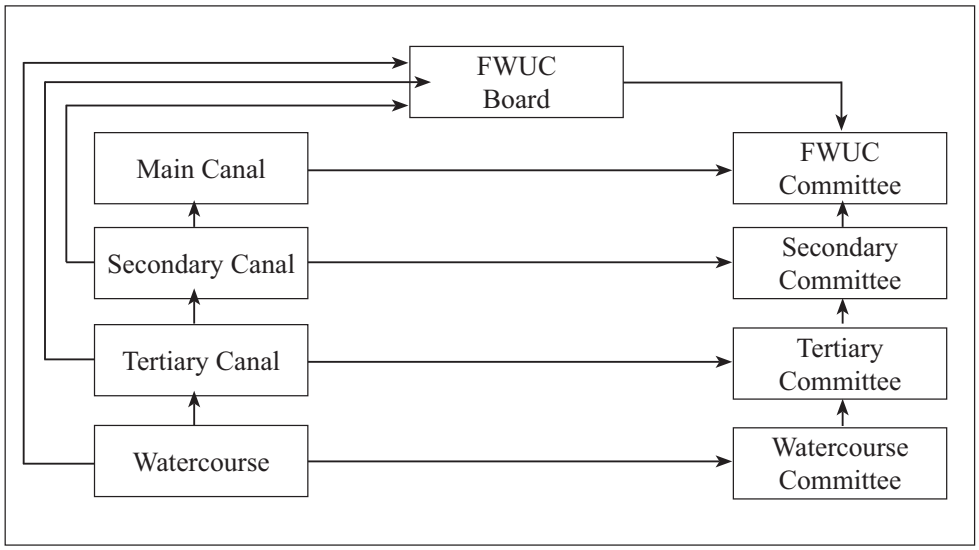
4.2.3.1. Farmer Water User Community

Farmer Water User Communities (FWUCs), with an organisational structure depicted in Figure 5, have been introduced by MOWRAM under the National Water Law as part of its formal Participatory Irrigation Management and Development (PIMD) strategy. It is designed to recognise local stakeholder participation in water governance, especially irrigation systems.

---

29 Interview with PDAFF director of Kampong Thom, 4 January 2010
30 Ibid.
31 Ibid.

Figure 5: FWUC Committee Structure



Source: Sinath 2002

The formation of FWUCs is based on *Prakas* 306 of MOWRAM to handle direct responsibility for irrigation scheme O&M.[32] At least on paper, FWUCs hold the following formal responsibilities: 1) prepare the community's work plan; 2) develop the statute, contract and community's internal order; 3) maintain the irrigation system in good condition for timely water allocation; 4) manage and allocate water to community members; 5) increase FWUC members' capacity on the use, maintenance and development of irrigation systems; 6) settle issues raised by community members; and 7) collect Irrigation Service Fees (ISF) according to the agreed amount set by the community (RGC 2000: Circular No. 1, Article 10).

The formation of FWUCs is seen by MOWRAM as a way of sustaining and improving effective use of water for irrigation with the financial and technical support of the government, reducing annual government expenses for irrigation system O&M, while gradually increasing farmer benefits and responsibilities (MOWRAM 2009a).

Under the policy, FWUCs have to coordinate with local authorities, government institutions and other external organisations. The FWUC in Stung Chinith reported that with support from PDOWRAM, GRET, CEDAC, Agence Française de Developpement (AFD), and local communities, it controlled the irrigation scheme sustainably and efficiently. Hence, scheme sustainability and efficiency still depends on external financial and technical assistance.

At a scheme level, the overall achievement of the FWUCs' primary purpose in managing, maintaining and operating small and medium scale irrigation schemes in a sustainable way is far from being reached. The village level findings indicate a significant disparity between FWUCs' formally-granted mandate and their actual effectiveness, including their difficulties in collecting the Irrigation Service Fee (ISF).

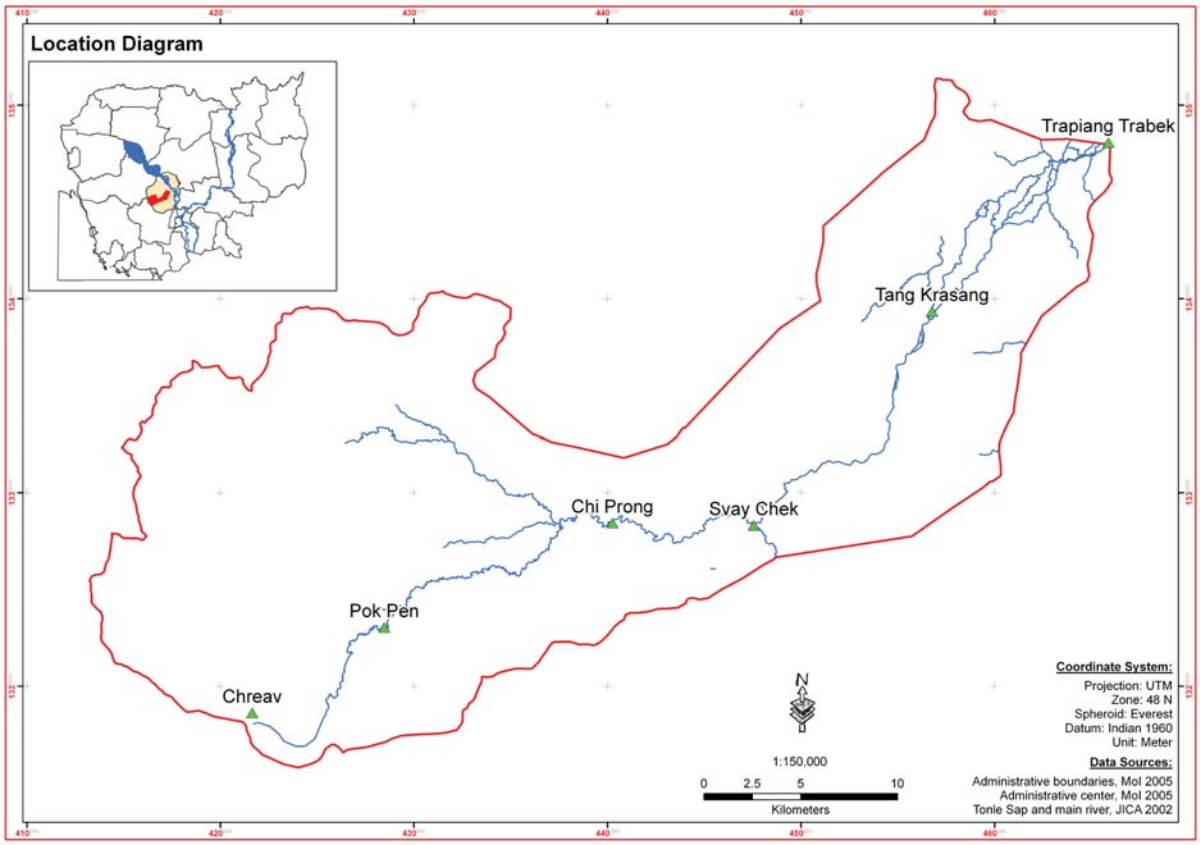
32 Draft Sub-decree on FWUC has been stalled at the Council of Ministers for over three years, and MOWRAM had to resort to MOWRAM's Prakas (Proclamation 306 on establishing community-based water management) to formalise the creation of over 300 FWUCs. This shows a certain level of institutional competition and the questioning of FWUCs' legitimacy by certain quarters.

The focus group discussions and provincial workshops indicated that at a catchment level, though FWUCs hold the legal and administrative responsibility for the irrigation schemes, most farmers or even neighbouring FWUCs (up and downstream) do not feel a strong sense of ownership of the projects/schemes. As a result, the FWUCs keep seeking assistance from LAs, PDOWRAM and other provincial line departments to solve their water issues, making it difficult for FWUCs to operate efficiently.

> *...FWUCs have managed and allocated water individually and there is no common FWUC representative so far. The FWUC has mostly worked with a few provincial line departments, such as PDOWRAM or PDAFF. Other provincial line departments are not well connected with each other...*[33]

In the case of Stung Chrey Bak catchment in Kampong Chhnang province (Figure 6), many interviewed farmers were under the impression that only PDOWRAM (or the LAs) had the right over the rivers in the catchment. In reality, all three stakeholders have the responsibility for the management of the river in the catchment. Improved coordination structures for the FWUCs downstream and upstream will provide an effective mechanism to improve their role in water allocation. However, this mechanism is still under consideration.

Figure 6: Stung Chrey Bak Catchment



Source: NRE, CDRI 2010

33 LA's comment in group discussion during provincial workshop, 24-26 February 2010, Kampong Chhnang province.

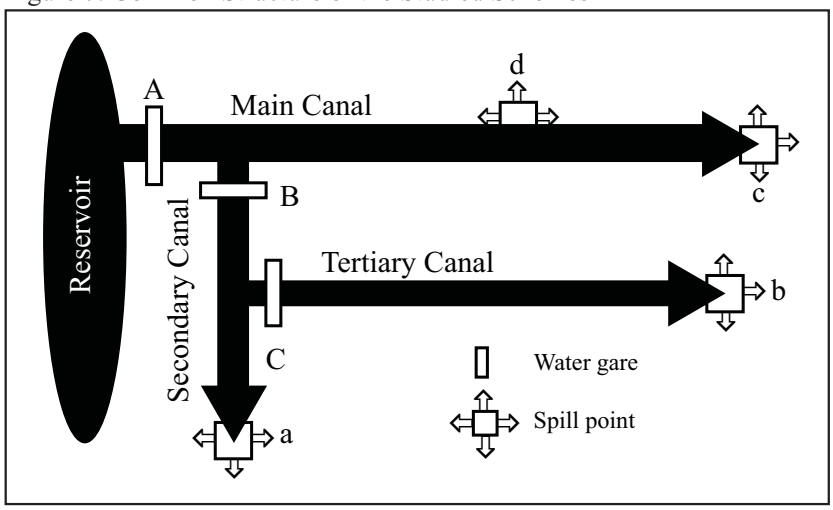
The scope of responsibility of the FWUCs encompasses the secondary and tertiary canal systems. In many cases, the FWUCs delegate tertiary canal management to the Farmer Water User Groups (FWUGs) whose rice fields cross such tertiary canals and are normally led by the village chief. At scheme scale, it should be noted that the reservoir and main canal fall under the direct responsibility of MOWRAM/PDOWRAM.

4.2.3.2. Farmer Water User Groups

As specified in Circular No.1, FWUGs are FWUC sub-groups which take care of the tertiary irrigation canals as they flow or cut across villages and rice fields (MOWRAM 1999). Figure 7 illustrates the structure and position of FWUGs relative to the overarching FWUC.

In most of the studied schemes of the three provinces, except for Taing Krasaing of Kampong Chhnang and Damnak Ampil of Pursat province (to be established), FWUCs have formed farmer and water user groups. For instance, in Stung Chinith Scheme, the FWUC will establish five sub-groups to manage five secondary canals and other drainage under its control (while PDOWRAM is responsible for the reservoir and main canal).

Figure 7: Common Structure of the Studied Schemes



Note: FiA controls fish in the reservoir, PDOWRAM controls water in the reservoir and the main canal (A), FWUC controls the secondary canal (B) and FWUG is responsible for the tertiary canal (C).

During wet or dry season rice cultivation, farmers report water demands to FWUG leaders who then ask the FWUC committee to release water from the secondary canal to the tertiary canal. When there are water shortages in the secondary canal, the relevant FWUC will contact PDOWRAM to release water from the main canal to the secondary canal. An example is Stung Chinit scheme, where all matters related to such water allocation are discussed and solved during weekly or monthly meetings presided over by the supportive committee.[34]

34 The supportive committee is presided over by the district governor; FWUCs, LAs, district police and line provincial departments, such as PDOWRAM, PDAFF and PDOE, are members. Issues are raised by members during the monthly meetings. The concerned institutions or LAs will be asked to tackle related issues to ensure good coordination and cooperation among stakeholders.

The interviewees from the studied schemes reported that in the earlier stages of the FWUGs creation, the role of each group member was well assigned. However, at present, due to difficulties in their living conditions and low levels of coordination among FWUG members and farmers, many established FWUG members have given up their roles. Most of the FWUGs are now led by village leaders. In this way, farmers and FWUGs could sometimes be viewed as passive or even "dependent" stakeholders (according to Mitchell *et al.* (1997), described above in the literature review). Farmers and FWUGs hold relatively little power despite having a legitimate and urgent interest in the outcome of irrigation scheme management.

4.2.4. Donor Landscape and Perspectives

Investment in the Cambodian water sector depends heavily on the international community (ADB 2003). This includes the World Bank, Asian Development Bank (ADB), and UN-system agencies including the Food and Agriculture Organisation (FAO), the United Nations Development Programme (UNDP), the World Health Organisation (WHO), and the World Food Programme (WFP). Bilateral donors such as the European Union, France, Italy, Japan and Australia, make significant contributions. Many international NGOs are also engaged, particularly in rural areas, in water supply, sanitation, small-scale irrigated agriculture, and community development (ADB 2003). A list of key donors funding irrigation development in Cambodia is provided in Appendix 2.

4.2.4.1. Donor Financial Contributions/ Roles

Many irrigation schemes and rural infrastructures are jointly funded by the government and donors, with financial and/or in-kind contributions (such as land and labour) from project beneficiaries. Specifically relating to water management, donor funding is often deployed to build "hard" infrastructure such as physical irrigation works, and to conduct extension programmes.

In Kampong Thom province, ADB and the Agence Française de Developpement (AFD) were the main donor agencies providing financial support to the irrigation schemes featured in this study. For example, in Steung Chinith irrigation scheme, the total project cost of USD23.8 million was divided between stakeholders as follows: the ADB at USD16 million in loan funding, the AFD at USD2.6 million grant, the Cambodian government at USD4.8 million and beneficiaries at about USD0.4 million.[35] A CEDAC interviewee further confirmed that the government contributes mainly for farmer compensation (payment for the paddy land which was lost during the implementation of the project), while the beneficiaries' contributions consist of the beneficiary-owned land and canal systems given over for irrigation system development.[36]

During the interviews, PDOWRAM indicated that donors such as ADB or the World Bank require smaller amounts of government financial contributions to implement the project, presumably to assist with project financing and to demonstrate ownership and commitment.[37] Often, the size of the required contribution represents a major cash outlay for the government and is not always met. It was further stated that most of the donor-run projects are proceeding satisfactorily, since they are well supported financially and technically. This reliance on donor funds suggests that donors fall within the "definitive" stakeholder group, as they claim power, urgency and at times, legitimacy. In

35 As recounted in an ADB key informant interview on 18 December 2009 and detailed on the ADB Website on Stung Chinit Irrigation and Rural Infrastructure Project : Cambodia, http://pid.adb.org/pid/LoanView.htm?projNo=29257&seqNo=01&typeCd=3 (accessed 15 June 2010)

36 Based on communication with CEDAC staff, 22 June 2010.

37 The interview was conducted with the director of PDOWRAM, Pursat province, in 2010.

circumstances where they could be perceived as lacking in legitimacy or urgency, donors might then fall within the classification of "dominant" according to Mitchell's *et al.* (1997) model.

4.2.4.2. Donor Technical Inputs and Roles

Overseas development assistance is still of critical importance in Cambodia. There are rapid moves towards a new and expanded era of partnership with the international community who provide extremely valuable financial and technical support in Cambodia's urgent need to fight against poverty (RGC 2007).

As reported in interviews, GRET and CEDAC with funds from donors like AFD play a very important role in providing technical support to the FWUCs and farmers in the Steung Chinith irrigation scheme, according to the implementation plan of the project in Steung Chinith approved by MOWRAM.[38] GRET and CEDAC lend support through agricultural extension training, site demonstration, and other training in such areas as financial management, ISF collection and committee election.

In Pursat, ADB had so far trained government staff of the concerned institutions in water-related activities, especially, the staff from provincial offices or districts[39]. For the irrigation project, ADB had also provided financial support and equipment for running the project including: staff allowance of the counterpart (PDOWRAM or PDAFF staff), office supplies, engines and a vehicle.[40]

Farmers in Rolous Scheme discuss on water issues, Kampong Thom

38 Based on interview with CEDAC and GRET staff on 8 December 2009 and further communication with CEDAC staff on 30 October 2010.

39 Interview with the director of PDOWRAM, Pursat province, 2010.

40 The PDOWRAM director's speech at the Research Finding Dissemination Workshop, Kampong Thom, Kampong Thom province, 22-23 May 2010.

Discussion and Lessons Learnt

5.1. Stakeholders' Roles and Perceptions in IWRM/PIMD

The stakeholders' roles and responsibilities in IWRM/PIMD are still not clear to many people involved in the day to day management and implementation of the policies. The lines of authority, jurisdiction and reporting in relation to the irrigation systems are often overlapping and unclear. Each stakeholder appears to perceive their roles and responsibilities differently from how other stakeholders see them. There are many reports of stakeholders being driven by their personal or institutional agendas rather than the overarching IWRM/PIMD model. Other stakeholders, including farmers and provincial government representatives who were interviewed, described how often those involved in running the scheme do not perceive the issues collectively, and believe that each stakeholder group should solve their own problems. Senior stakeholders explained the many institutional barriers about how MOWRAM/PDOWRAM and MAFF/PDAFF work together. MOWRAM/PDOWRAM is responsible for irrigation water, yet MAFF/PDAFF is dependent on this irrigation water for agricultural production. Despite this inter-dependency, there are reports that these agencies still perceive their interests, challenges and achievements separately. For example, if there is no water for irrigation, it is seen as MOWRAM/PDOWRAM's responsibility and if there are high volumes of water and successful irrigation, MAFF/PDAFF assumes responsibility for the agricultural output. Some stakeholders argue that the organisations should work together more effectively and share the setbacks and achievements.

Participation in irrigation management implies that farmers should be involved in the process of designing policy. Yet, it is still common for farmers and other stakeholders to work in hierarchical ways and rely on higher levels of government for direction.

The complex institutional set up at the national levels also inhibits participatory decision-making. For instance, NCDD has members from many line ministries, except MOWRAM. NCDD tries to promote empowerment of local authorities and communities (encouraging more bottom-up decision-making), while MOWRAM creates the FWUCs in a top-down manner at the local level, following the PIMD policy, since they must be initiated and registered by MOWRAM. This is a barrier that limits the participation of farmers in the governance process.

Deference to political and administrative power is embedded in Cambodian society, where local leaders are known to villagers. This kind of power interaction reflects the challenges that FWUCs also face regarding the PIMD implementation. This complexity can be solved only by the involvement of local authority such as commune councils in the FWUC management. So if the commune councils are the FWUC committee members (such as in Damnak Ampil scheme of Pursat where the FWUC consists of commune councillors of the seven recipient communes), farmer participation in paying ISF, O&M, etc can be smooth. Their involvement eases the operation of FWUC; however, the distinction between the "state" (commune authority) and the non-state community-based association becomes even more blurred.

The major stakeholder groups involved in irrigation scheme management and development have divergent perspectives. PDOWRAM representative interviewees stated that irrigation projects run well because of adequate financial resources. When available, these financial resources can be used to cover the cost of resettlement in circumstances where villagers need to be resettled due to infrastructure development. However, some LAs argue that a key indicator for being a good irrigation project is when it can facilitate effective water allocation to all without conflict. These

two perceptions focus on two different concerns. To cope with urgent demand (such as water for farming or flood protection), the government's position is that by whatever means, if they can start the irrigation project well, it is good enough. Farmers focus more on the output or impact of the project, which is to improve their livelihoods through adequate provision of water. This suggests that irrigation projects can be seen from the perspective of physical infrastructure and of whether or not they can sustainably provide water. Often, donors are flexible enough to provide supplementary funds to ensure that irrigation infrastructure is constructed according to the project agreement. The focus of most farmers' concerns is how irrigation systems improve their rice farming practice and how they (farmer and FWUC) can operate such infrastructure to gain sufficient water for rice farming after the donor's project is completed.

Understanding the role of FWUCs in irrigation management, especially in ISF collection, is a challenge for many players. Given the real condition of the irrigation schemes in general, as observed during the field study, the current PIMD cannot encourage farmers to fully participate in paying water service fees (ISF) or in the O&M of the schemes due to lack of infrastructure or poorly maintained infrastructure, or lack of proper understanding of the real nature and importance of ISF. The provincial department had been once asked "…why does the government develop the canal for people, but create the regulation to collect money from people?..." This is still questionable in performing sustainable irrigation management.41

Management issues at the irrigation scheme level tend to be solved on a problem basis rather than on a planning basis or strategic approach, since FWUCs do not have enough capacity to plan irrigation development and management in the long term. Problems are solved on a case to case basis by the FWUC, LAs and PDOWRAM/MOWRAM. PDOWRAM claims that as they are a technical department,[42] they have in place conflict resolution mechanisms (or functions) to prevent and solve water problems, since farmers and commune councillors do not have enough capacity to tackle the problem.

In theory, FWUCs hold a legitimate role in managing irrigation water, but do not have the power to regulate and manage water resources. It was observed that at scheme and catchment levels, FWUCs' legal and administrative responsibility over the irrigation scheme is not effective for many reasons including limited power and authority, limited support funds, inadequate capacity and lack of human resources. Additionally, there are few accountability mechanisms in the FWUC governance structure, resulting in low levels of trust and poor public service delivery for most farmers and their neighbouring FWUCs (up and downstream). In many schemes (Taing Krasaing, Wat Leap, Kampang), FWUC committees have abandoned their duties and even their interests (rice fields) which fall within the scheme.

5.2. Issues Arising

Building upon key stakeholder perceptions, understandings, assumptions, objectives, experiences and evaluations regarding existing water governance arrangements in IWRM/PIMD as mentioned above, a number of key concerns emerge:

- The need for more effective stakeholder participation in IWRM/PIMD policy implementation;

41 This information is based on interview with PDOWRAM director in Pursat on 27 January 2010.

42 They often call themselves or are called as "specialised department" or "competent department" or in Khmer as *"sathaban chhum neagne"*

- The need for improved stakeholder coordination;
- The need for solving the challenges of coordination across the catchment/river basin;
- The need to improve the role and effectiveness of FWUCs; and
- The demand for long term support funds.

The next section discusses the above issues and seeks to offer suitable options to reconcile the water policy adopted by the government with stakeholder practices, so the interaction between these components of the system are more effective.

5.2.1. Improve Stakeholder Participation

Engaging community/stakeholders to participate in water management has been supported by a series of government policies for the management of water resources. The term "participation" is referred to as a process through which stakeholder's influence and share control over the development of initiatives and the decisions and resources which affect them[43].

The national water policies aim to strengthen and increase FWUCs to participate in water allocation and management and to effectively and sustainably maintain irrigation system (RGC 2004). The Water Law 2007 has further called for collaboration with and participation of relevant agencies, private sector, beneficiary groups, NGOs and international organisations in all activities related to the management, investment, exploitation, conservation and development of water resources by taking into account the balance social and environmental assets (RGC 2007).

However, lack of community involvement in decision making processes relating to irrigation development projects, including initial appraisal, planning, implementation, monitoring and evaluation, in the past, pushed farmers away from meaningful participation. For example, due to time constraints and limited funds, some of the existing schemes in Kampong Chhnang and Pursat province were built without the key local stakeholders' participation in the early stages of design and development. As a result, the schemes were built at a lower level and water could not flow into the main canal. This made farmers no longer willing to participate in the scheme's O&M after these were handed over to them. These experiences suggest that stakeholder involvement in designing the technical approach is important in ensuring the long term management of irrigation systems.

State agencies and donors were the main actors in developing and putting PIMD and D&D policy into practice. The existing policy mainstreaming process has been variably effective, but overall the levels of community participation at a practical level, in many areas, have failed to reach the objectives of the policy. It was argued that "…since the policy was an accepted part of an overall donor funding package, such policy application would fail due to the lack of involvement of local people and primarily, the lack of political will…" (SaciWATERs 2009: 8). Cambodia has reformed its policy towards decentralisation of development and NRM. Local communities and farmers have much opportunity to plan and manage their resources. However, some constraints also occur when put in practice, for instance the implementation of the D&D and PIMD policy. On this issue, TWGAW acknowledges that there are some gaps, overlaps and poor coordination of functions within the present public administration reforms which require remedying (SAW 2007: 4). The field survey found that in O Svay scheme, Kampong Thom, the FWUC has a mandate in its statute to

43 As cited by Warren A. Van Wicklin in The World Bank's Experience with Local Participation and Partnerships, The World Bank Group, (2001)

allocate water and to coordinate with the LA who, by organic law, has rights and power to punish illegal activities such as damaging canals, damming to catch fish, or discharging water without authorisation. Due to limited coordination from LAs, FWUCs cannot solve the above issues. This has resulted in farmers being less trusting and having less desire to participate in water management; instead, they tend to rely on commune councils to solve any water use conflict.

The level of stakeholder participation within the context of IWRM/PIMD is different from one scheme to another. Farmers get involved in this policy practice in relation to some of the main activities such as contribution of land for scheme development, water use fee payment and O&M of the irrigation system. Irrigation management could be sustained under certain key conditions: namely, when the operation and maintenance of the schemes are run by the community itself; the schemes are built with adequate canal and drainage systems and FWUCs have enough local capacity to manage them effectively, and so on. This means that the cost of fee collection can cover the expense of the O&M. However, Circular No. 1 states that the government should be able to help subsidise the running costs. In the case of the Rolous scheme, in Kampong Thom province, which was seriously damaged during the Ketsana storm in 2009, about 180m of irrigation dam was destroyed. ISF (5,000 riels per household per year) is collected every year for O&M of the scheme's canal and mostly from the farmers that benefit from the water (i.e., from those living in the northern part of the scheme). It cannot be collected from those in the southern part due to the lack of timely response to farmers when they need support from the FWUC committees. ISF is still dependent on voluntary contributions, and the amount collected is not commensurate to the scheme's repair costs. So FWUCs rely on the commune support fund (approximately 7 million riels per 2 years- 2008-09) and emergency funds from PDOWRAM for scheme maintenance. Such poor participation leads the FWUCs to operate the scheme in an unsustainable and ineffective manner. This case highlights the observation that the PIMD objectives are currently not being achieved in many areas.

'Face-to-face' communication is considered more effective, yet the required cost is also more. Such is the case of Damnak Ampil irrigation scheme where beneficiaries are from seven communes. Information sharing among these recipient communes is difficult due to poor infrastructure. It is even harder when there is a lack of financial resources to support all the committees to come together for their meetings.

An external support fund is also still required even though the irrigation infrastructure is mostly built. In Chinith scheme of Kampong Thom province, the support fund from GRET and CEDAC finished in June 2009. This casts doubt on the sustainability of the FWUC, however, since up to now, the collected ISF can only support around 50-60 percent of total O&M costs. The FWUC in Chinith scheme would like to increase the ISF from 30,000 to 60,000 riels per hectare (ha) per year (roughly about USD15) to ensure that the O&M costs are met. However, complaints from farmers about paying water fees will eventually be heard since they may not want to pay a higher ISF amount while their rice production remains the same. This means that external support is needed to cover the O&M expenditure. Another possible solution to this issue is to increase rice cropping from 1 to 3 times per year to cover the ISF, but this may be difficult for three main reasons: (1) farmer attitudes and scepticism about dry season farming, (2) the threat of insect infestation during the dry season, and (3) the current practice of allowing cattle to graze (and consequently damage) the rice fields during the dry season.

There are many kinds of communities in the study areas, such as the FWUCs under PDOWRAM, the agricultural communities (the Dry Season Rice Association) under PDAFF, and the Village Development Communities under the Provincial Department of Rural Development (PDRD). However, the level of participation in water management among them remains limited. Sheldon

(2005) argues that the effect of a scaling-up approach is that it increases the number stakeholders in the decision-making process, leading to a conflict of interests among those actors. This seems to illustrate the coordination between PDOWRAM, PDAFF and PDRD which has become reputation-driven in water management, especially to gain farmers' trust. As a result, the failure to achieve successful water management lies in the failure to get all players involved without being too focused on their own institution and own interests. For example, the unsuccessful dry season demonstration in Chinith scheme made farmers care less and participate less with the responsible institution and in modern agricultural policy, especially agricultural extension and the Integrated Pest Management Programme. Cooperation and harmonisation among the concerned institutions is much needed.

5.2.2. Strengthening Stakeholder Coordination

Strengthening stakeholder coordination is vitally important, since it can sustain irrigation investments and ensure that the management and maintenance of irrigation water systems continues.

In theory, FWUCs are supposed to manage local water resources independently of the commune council's political hierarchy. The reality, however, is that informal governance arrangements often serve to negate this independence due to limited capacity, human resources and other resources. According to FWUC members in many of the studied schemes of the three provinces, despite the government's emphasis on the decentralisation of natural resource management, FWUCs and farmers, for the most part, still rely on the coordination or support of local political hierarchies, including commune councils, district authorities, concerned institutions, etc to make important decisions.

FWUCs wield real influence – in cases where this happens – from within the commune council framework rather than independently from it. For example, in Svay Check scheme of Kampong Thom province, the village chief was also selected as the first vice-chairman of the FWUC. In Pok Pen scheme in Kampong Chhnang province, the commune chief and the FWUC committee work together in maintaining the irrigation system, and in many cases farmers reported water issues directly to the commune council rather than to the FWUC committee. A commune council representative in Pok Pen, Kampong Chhnang province, also opined that "LAs, FWUCs and farmers have traditionally coordinated or cooperated with each other in agriculture as well as in the management and allocation of water".

Although FWUCs take their responsibility seriously and usually put the common interest as first priority, their capacity is often limited and they cannot run without external/PDOWRAM support during water shortage, according to a representative of PDOWRAM as mentioned that: "... They (FWUCs) can independently manage water when water is available, but they will come to PDWRAM when facing water scarcity...".[44] Similarly, in Kampang Scheme in Pursat province, the FWUC sometimes relies on the commune council to perform some of its water management duties, since FWUC committee members are sometimes too busy with other (non-water related) matters. These matters are consistent with the findings of a recent study on PIMD and the factors affecting FWUC formation by Perera (2006), which also found that most FWUC activities were implemented under the direction of the commune chief. This is not an ideal outcome to convey to MOWRAM, PDOWRAM, donors and NGOs that want to see how large amounts of financial and technical assistance have been invested. As observed from field trips, FWUCs seem to focus more on water allocation than diversifying farmers' income. The statement by PDOWRAM below has often been used to inspire FWUCs.

---

44 Interview with the director of PDOWRAM, Pursat province, 2010.

…As elected by farmers, FWUCs have to consider the selection of seeds, fertilisers, pesticides, crops and develop the implementation plan to lead farmers to get high yields, not just to collect the ISF when farmers start harvesting for scheme maintenance or to ask for support from LAs when facing issues. FWUCs have to expand their strategy to lead farmers to have more income… [45]

Lack of coordination among beneficiaries often occurs when there is water scarcity. During these times there is a tendency for beneficiaries to prioritise their individual interests over group interests. Kelsey (2009) argues that users must be coordinated around the use of common property resources, such as water, especially as every user of a common property resource decreases the availability of the resource for all other users, but only feels a fraction of the loss associated with its future use. As such, every user is required in times of water scarcity to decrease their use. This can be done most effectively through a coordinated approach. In many schemes, while law enforcement measures are not applicable or have little influence, farmers do not want to release water to others downstream. Conflict of interest, due to lack of coordination, is ultimately crucial. In some cases, FWUCs have not been able to solve these conflicts and have passed them over to PDOWRAM or the LA. This relationship or reliance on PDOWRAM to assist FWUCs resolve conflicts is demonstrated in the following quote:

…Whenever they (the FWUCs) face issues such as water use conflict, flood or drought, they call for a meeting to solve the issues locally. When they cannot do this, they will ask PDOWRAM to help. PDOWRAM always helps them, but has only small packages of funds to use (or to support FWUCs) in urgent situations like drought or flood…[46]

Based on the PIMD, the sustainability of irrigation management relies mainly on the FWUCs' performance using locally based resources under the external support of the government. Beneficiaries or water users are obliged to pay for the routine costs of O&M. However, farmers have many reasons not to cooperate with FWUCs in many instances. This in turn has led the FWUCs' operation to rely mainly on on-going coordination, technical and financial assistance from institutions such as MOWRAM/PDOWRAM, LAs, PDAFF, PDRD, Provincial Department of Land Management Urban Planning and Construction, PDOE, PFiA, NGOs and donors (ADB, WB, JICA, AFD).

5.2.3. Solving the Challenges of Coordination across Catchment/River Basin

A centralised implementation system is not only common in the national administrative sector, but also in water management and development (Lee 1999). This practice results in managing water resources where "the water institution tends to respect administrative boundaries rather than watersheds" (ibid: 38). A centralised approach based on administrative boundaries is a barrier to participation for the provincial departments. Many irrigation schemes in the study area reflect this challenge. Different FWUCs are created along the catchment, such that downstream and upstream users face many water conflicts when water flows across their areas. When the water flows from Damnak Ampil across different provinces, Pursat and Battambang, for example, the conflicts are difficult to deal with when farmers downstream in Battambang province need water released from the upstream users in Pursat. In one serious case, a village leader and other farmers from Neak Tatvea (Battambang) came to the FWUC in Kampang (Pursat) and furiously asked to release water to their area without listening to the explanation of the FWUC. Another example is the conflict of water sharing in the four main schemes in Stung Chrey Bak catchment in Kampong Chhnang province

45 PDOWRAM director's speech at the provincial dissemination workshop in Kampong Thom, 2010.
46 Interview with the director of PDOWRAM, Pursat province, 2010.

(see Figure 8). Stung Chrey Bak River flows from the Aural Mountain and passes through Pok Pen, Svay Chek, Taing Krasaing and Trapaing Trabek scheme. In the past during a period of water scarcity, with guidance from PDOWRAM, the FWUC and farmers in Trapaing Trabek negotiated with the FWUC in Taing Krasaing, Svay Chek and Pok Pen to release an amount of water to supply dry season rice farming in Trapaing Trabek. It was reported that their negotiations were successful only about ten percent of the time. Approximately ninety percent of the time, the water was not allocated to them. Coordination support from LAs across the schemes is without doubt crucial for local governance.

The absence of a proper and substantial legal framework at the catchment level creates a barrier to effective stakeholder coordination. Three important sub-decrees namely the Sub-decree on FWUCs, Sub-decree on River Basin Management, and Sub-decree on Water Allocation and Licensing are still in draft. The absence of this legal framework makes it difficult for agencies to implement their assigned duties within their areas of jurisdiction. Another critical barrier is the lack of enforcement and compliance.

The demand for better management of water resources in a river basin context requires a proper water governance policy aimed at providing accountability, transparency, equity and public participation with strong commitment from all concerned stakeholders in agreeing to and implementing relevant law and policies. An improved water governance system under the government's legal framework at the river basin level would, in turn, support the capacity of FWUCs, LAs and local institutions to sustainably manage water resources in the wider landscape.

5.2.4. Strengthening the Role and Accountability[47] of FWUCs

The management of the FWUCs at the local level is based on the FWUC's statute (by-law) and guided by PDOWRAM. FWUCs were established on the request of farmers or village groups and were approved by LAs and PDOWRAM. Not all of the FWUCs are registered with MOWRAM yet.

Theoretically, the FWUCs are established to decentralise water governance. To PDOWRAM, however, creating FWUCs would also mean reducing the work load of the provincial department.[48] To enable FWUCs to effectively work in their own community, they should be technically independent. FWUCs should have enough authority to manage their resources to decentralise water governance. They hold the official role in managing irrigation water, but do not have the power to regulate and manage water resources.

Achieving technical independence of the FWUCs is not straightforward. Representatives of PDOWRAM observe that the FWUCs' capacity to manage irrigation is still limited. They encounter this challenge in many areas in relation to irrigation management. A number of representatives of the FWUCs think that farmers and the FWUC committee members themselves need to be trained on water law and policy, FWUC statue and their related responsibilities. The main question is to what extent existing laws and regulations address the needs of farmers and until this issue is settled, this decentralisation mechanism remains a challenge.

---

47 According to the World Bank, the concept of accountability involves two distinct stages: *answerability and enforcement.* Answerability refers to the obligation of the government, its agencies and public officials to provide information about their decisions and actions and to justify them to the public and those institutions of accountability tasked.

48 A PDOWRAM interviewee mentioned that PDOWRAM had so far established FWUCs to control and manage water and water resources in target schemes. PDOWRAM has FWUC to be responsible for opening a closing water gates.

FWUCS regulate and administer the irrigation schemes yet the LAs have the vested task of enforcement.[49] Furthermore, despite being independent organisations with a mandate to coordinate and facilitate local water-related issues, FWUCs are hampered by the fact that they do not have any conflict resolution powers. The FWUC committee members questioned how FWUCs can solve the issues that impact on scheme infrastructures or on the allocation of water in several locations including O Svay and Chinith schemes in Kampong Thom, and Kampang Scheme in Pursat province. According to the FWUC statute itself[50], FWUC committee members cannot take any measures against non-compliant farmers. Their role is merely to inform the LAs, in the hope that some administrative/ enforcement measures may be taken.

The lack of community ownership is exacerbated by a perceived lack of legitimacy of the FWUCs, partly caused by difficulties and delays in FWUC registration. In order to be formally and legally recognised, each FWUC (along with its governing statutes) must be registered with the provincial or municipal directorate of MOWRAM. For certain reasons, some FWUCs reported having to wait many months or years to receive formal government recognition. The specific cases include the FWUC committees of Trapaing Trabek, Svay Chek and Pok Pen schemes in Kampong Chhnang province, who reportedly submitted the FWUC registration documents to PDOWRAM, who then claimed submitting these to MOWRAM for final approval more than two years ago. Their formal registration is still pending[51] and as such, the FWUCs cannot gain any legitimacy with the farmers and LAs.

5.2.5. Ensuring Support Funds for Water Resource Management

The country is heavily subsidised by external sources of funds for water resources development. A long-term decline in availability of donor funds is likely, and alternative means of funding investment are needed (ADB 2003).

The government invested over the last decades a number of technical and financial efforts aimed at minimising the rain-fed dependence of farmer countrywide. To achieve its target in the Action Plan on Water Resources Management and Development 2009-2013, the government requires about USD736 million, of which USD99 million is government funds and USD636 million is donor funds. By 2009, approximately USD206 million of total donor funds were contracted with development partners (MOWRAM 2009b).

Since 1979 to present, large amounts of the national budget, loans from the World Bank, ADB, IMF, and the International Fund for Agricultural Development (IFAD), China, Kuwait, South Korea, Japan and donor funds were directed to rehabilitate, construct and maintain the irrigation systems, flood protection dykes and install the pumping stations (MOWRAM 2009b). The costs of O&M of irrigation systems normally are not met by funding agencies. Appendix 2 presents the major development partners on Cambodia's irrigation systems.

---

49 The most common illegal activities involve releasing/discharging water without authorisation from the FWUC, damaging canals or building small dams for fishing.

50 The FWUC statute as stated in Circular No.01 dated 11 January 1999 on the "Implementation Policy of Sustainable Irrigation Systems".

51 PDOWRAM representatives said they had sent the FWUC registration documents to the FWUC department at MOWRAM. The staff from the FWUC department responded that they had never received such a document and that there would be no other reason for delay. To clarify this issue, MOWRAM officially confirmed that once FWUCs have submitted their registration documents and while they are being processed by PDOWRAM/MOWRAM, FWUCs should perform their legal duties and roles as usual.

The development, rehabilitation or extension programmes of irrigation systems are implemented only on the basis of feasibility and the demand of the majority of farmers. Financial sustainability of water service delivery should be achievable, given that the service to identified users is levied. PIMD encourages farmers to manage their own irrigation systems and to properly use the limited government, donor and their own resources. As beneficiaries resist paying for poor service or participating in O&M, post-project sustainability is always at risk. Substantial building of capacity and reliable long-term funding for resource management are needed. The government policy has also encouraged private sector, NGOs and international organisations to invest and develop small, medium and large scale irrigation systems. Ensuring long term funding for the management and development of water resources remains an endless challenge for Cambodia and external support funds are crucially important.

5.3. Lessons Learnt: Towards Good Governance in Irrigation Management

The previous analysis highlighted the emerging issues and experiences of a range of stakeholder groups. This section outlines some of the key lessons learnt and how some of these issues may be addressed using additional data gathered from the national and provincial workshops.

5.3.1. Improve Coordination among FWUC and Local Authorities

Local authorities have taken on a wide range of responsibilities for development planning and natural resource management, and are increasingly expected to take on even more wide ranging responsibilities. At the sub-national level, the Provincial Rural Development Committee (PRDC) is the main mechanism to ensure effective communication between state agencies and NGOs. A successful irrigation management needs cooperation with a LA. The LA has some law enforcement powers, for example the power to arrest and charge accused persons; FWUCs, on the other hand, have been established only with the power to fine farmers who disobey the internal regulations. These legal frameworks show that coordination among FWUCs and LAs is vital.

Based on the interviews and direct meetings with various LAs, there are benefits to good coordination among FWUCs and LAs in some areas. There may be opportunities to apply these benefits and lessons to other communities to improve management effectiveness:

- FWUC water management activities can be empowered by external stakeholders who recognise and strengthen the roles of FWUCs within each scheme and between schemes. One way to do this is for the LAs to offer greater support to the FWUCs because their mandate is higher; there are reports of improved coordination among upstream and downstream FWUCs when this support is offered;
- Facilitating and strengthening stakeholder coordination can create greater networking among FWUCs, LAs/communities and government agencies like PDOWRAM, PDAFF, PDRD, etc;
- Close collaboration among FWUCs, LAs and provincial departments creates good networking that may help to improve data and information sharing on water availability, agricultural extension, regulations and guidelines on the use of water resources and irrigation development projects to all players. Improved understanding helps effective conflict resolution and conflict management;

- Collaboration helps to improve planning and decision making capacity by giving more opportunities to FWUCs to get involved and be trained in planning and decision making;
- Better coordination between FWUCs and LAs can also improve public participation in local planning and activities such as road maintenance, scheme O&M, canal and dam development and protection of natural resources. For example, in Svay Chek and Taing Krasaing schemes in Kampong Chhnang province, LAs played a very important role in encouraging and leading farmers to rehabilitate and maintain the infrastructure;
- LAs can help to strengthen administration, law enforcement measures and dispute resolution since the authority of LAs is widely respected in communities and FWUCs do not have this power;
- Coordination can help the FWUCS gain better access to funds and budgets since LAs get better access to provincial, district or commune investment funds, the private investment sector, NGOs and research and education Institutions such as CDRI, the Institute of Technology of Cambodia (ITC), the Royal University of Phnom Penh (RUPP), etc; and
- Coordination may be supported by establishing a support/sub-committee for water resource management and conflict resolution, as is the case in Stung Chinith scheme (further detailed in the section below).

5.3.2. A proposed new Coordination structure: "Scaling-Up" Community Management Approaches

A new coordination structure has been proposed by key stakeholders[52] to improve networking and coordination from one scheme to another and to provide a full mandate and effective authority over the management of water resources at a catchment level (Figure 8).

The new structure proposes that the irrigation and catchment management sub-committee (ICMSC)[53] will call for timely (in case of urgent situations) or monthly meetings during which the members of the subcommittee or FWUC will report all issues so that corrective actions can be made by the responsible unit or ICMSC member. Where law enforcement measures are needed, the chair of the sub-committee will request the support from a competent authority, including the police and military police, to crack down on illegal activities. The meeting report will be sent to the provincial governor to seek comments or recommendations on future action to improve such a committee.

5.3.3. Improving Stakeholders' Responsibility in Irrigation and Catchment Management

The stakeholder typology enables us to define power (influence), legitimacy (interest) and urgency of key stakeholders in our study sites. The findings offer an added value, especially additional insights on the positions of the stakeholders in water governance and management.

The outcomes of the stakeholder positions analysis are combined with the results of the provincial workshops (as explained in section 2), and classified by stakeholder group to see how their roles and responsibilities are assigned and required by different stakeholders. The final

52 This includes farmers, FWUCs, village leaders and LAs (commune leader/councillors, district governors and provincial officials), government institutions and NGOs who participated in the provincial workshops conducted in Pursat, Kampong Thom and Kampong Chhnang provinces, February to April 2010.

53 The vision and strategy of such a committee is listed in Table 1.

results have been synthesised (see Table 1), which allows for the identification and reporting of potential solutions to the issues identified throughout this paper's earlier discussions. Note that the stakeholder identification and analysis process at the provincial workshops started by canvassing desired outcomes, and worked back through strategies to achieve them, changes required to follow such strategies, and required changes of practice among stakeholders. Hence the arrows in Table 1 take us from end-point to basic changes rather than vice-versa.

Figure 8: Proposed Irrigation and Catchment Management Sub-committee

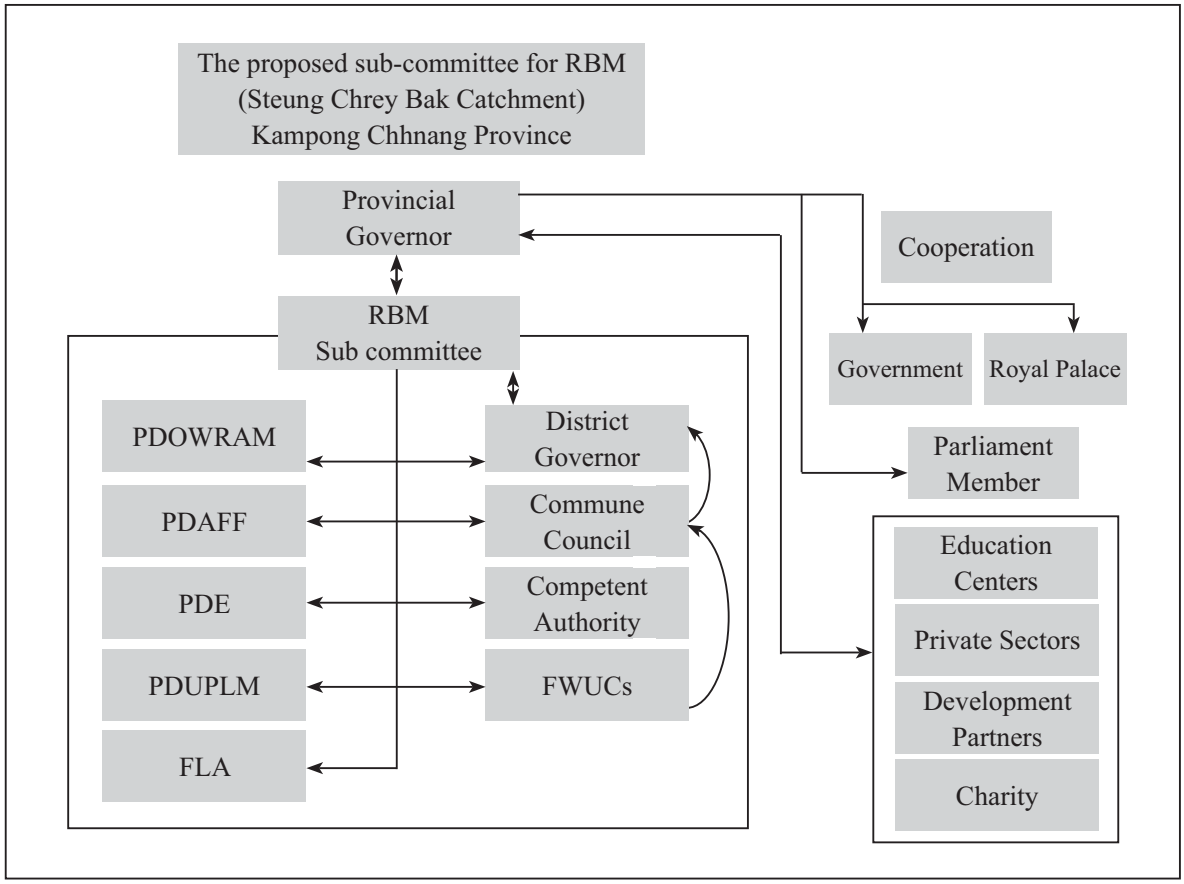


Table 1:Stakeholder Identification and Analysis Matrix in Irrigation and Catchment Management in Cambodia

Stakeholders	Change in practice	Change in knowledge, skills or attitude	Suggested strategies for achieving the desired changes	Desired outcomes
Farmers/ FWUGs	- read/seek information about water quantity and availability at different times in the year - comply with internal orders from FWUCs - create cropping calendar - report water issues to FWUG or FWUC leader - select farmers with strong commitment and elect them as FWUC committee members - farmers and FWUGs base their farming practices on the instructions and information provided by PDOWRAM and PDAFF on water availability to avoid water scarcity during the dry season	- understand the benefit of irrigation system - aware of water quantity/availability and land area for cropping - - aware of water demand and irrigated area	- disseminate information about water availability to FWUCs and farmers seasonally	- allocate and use appropriate amounts of water at the right time of year to maximise productivity
	- participate in O&M of the irrigation system - farmers allow land acquisition for canal development at an agreed reasonable price - farmers and FWUGs contribute ISF as required in the statute	- increased knowledge of hydrological and catchment systems and the linkages between upstream and downstream use - increased understanding of environmental, water and fishery laws and related water policies - change in attitude towards how community benefits can be attained	- create a common sense shared interested to protect the common resources of the community (natural resources and hydro-infrastructure) through demonstrating/ communicating positive experiences from other communities - support better leadership at the FWUC level to inspire communities to think differently about their shared resources	- allocate water to users on an equitable basis

Stakeholders	Change in practice	Change in knowledge, skills or attitude	Suggested strategies for achieving the desired changes	Desired outcomes
FWUCs	- improved decision-making in relation to water allocation - strong commitment and participation in rehabilitation development and O&M of the irrigation system	- increased awareness of water quantity / availability and land area for cropping, water demand and existing irrigated areas	- develop a record/ inventory of paddy field owners - develop canal and land owner data	- allocate water on time to the appropriate place and appropriate farmers to achieve greater productivity and also to gain better trust and establish accountability with farmers
	- conduct ISF collection more widely and undertake O&M of the schemes according to the agreed plan	- FWUCs to gain improved financial knowledge about basic accounting	- develop a plan at the FWUC level to ensure ISF collection - develop at the FWUC level for O&M of schemes - maintain good coordination with LAs and concerned provincial departments	- ensure sufficient operational funds are available on an on-going basis to support the sustainability of the irrigation system
	- apply skills and knowledge learnt in daily farming practice - settle conflicts in water use	- increased understanding of how local and traditional indigenous skills in water management and allocation might complement IWRM and PIMD - ability to develop cropping calendar - ability and skills in solving water issues	- increase opportunities and access to training from NGOs, PDOWRAM, and LAs in hydrology, IWRM, PIMD and work with communities to develop local strategies for how these broader frameworks can be implemented at the local level - conduct regular meetings with supporting committee for water management	- high capacity to operate within the IWRM and PIMD framework and to peacefully resolve water related issues and disputes

Stakeholders	Change in practice	Change in knowledge, skills or attitude	Suggested strategies for achieving the desired changes	Desired outcomes
Sub-national and LAs[54] and ICMSC[55]	- maintain good coordination with FWUCs, NGOs, and concerned provincial departments - conduct regular meetings on water management - provide professional training (on agriculture, local administration and planning, budgeting, marketing and accounting management)	- hydrological and technical skills developed - coordination and facilitation knowledge improved - awareness of agricultural area and labour (farmers)	- support training on water allocation techniques and water management - disseminate information on water management policy and water use impacts regularly to farmers and other water users - regularly provide professional training on hydrology and water related issues - prepare water allocation and management policy, planning and strategy - develop database on water resources and M&E water resource management implementation at national and local level	- strengthen SC's capacity and mechanisms for conflict resolution - build capacity in water resource management and allocation and increase hydrological and technical capacity
	- seek funds for irrigation development	- improved awareness and skills in hydrology and agriculture - increased communication, and NRM skills	- provide technical and financial support to FWUCs - provide regulation and technical services - increase contact with donors, NGOs and related institutions involved in water management and irrigation development sector	- rehabilitate and develop irrigation systems
	- greater compliance by famers with laws and regulations	- increased understanding of the rationale for legal and regulatory policy	- promote participation and coordination among relevant stakeholders -provide education and training about current law and policy, especially IWRM and D&D	- increase law enforcement and M&E of the implementation

54 Provincial and district governor and commune councillors
55 The inter-district committee or sub-committee under the provincial committee

Stakeholders	Change in practice	Change in knowledge, skills or attitude	Suggested strategies for achieving the desired changes	Desired outcomes
MOWRAM, MAFF, MEF, PDOWRAM , PDAFF and concerned provincial departments[56]	- keep good coordination with FWUCs, NGOs, and concerned provincial departments - administer international collaboration - coordinate with sub-national authority to establish supporting committee to be nominated by provincial governor - organise regular meeting on water management	- improved knowledge in the management of water resource, agriculture, forestry and fisheries	- jointly prepare policies involving the management of water resource, agriculture, forestry and fisheries - provide technical advice and financial support - create FWUCs	- increase and improve the coordination and integration of planning and management among key important institutions
	- MOWRAM/ government to provide reasonable compensation for land acquisition that is required to develop infrastructure	- knowledge in analysing environmental and social impacts of development and rehabilitation of irrigation systems - hydrological and O&M knowledge - improved understanding of modern agricultural techniques which provide high yield - awareness in labour and water demand, selection of seed and fertiliser use, soil preparation and land use planning	- provide professional training; - research, monitor and evaluate water management, arrangement and implementation at local level and create proper water management policy - develop and manage participatory approaches in water resource management which involve all levels of users, planners and policy makers - seek funds for irrigation development	- develop proper irrigation systems and manage water allocation; - independent mediation of conflict - law enforcement, M&E - settle water related issues

56 PDOWRAM, PDAFF, PDOE, PDORD, FiA, PSDD,

Stakeholders	Change in practice	Change in knowledge, skills or attitude	Suggested strategies for achieving the desired changes	Desired outcomes
NGOs, research and education institutes[57]	- provide training to FWUCs on local administration, PIMD, agricultural extension and IPM - disseminate the water law, fishery law and environmental law to farmers, FWUG and FWUC members - prepare and review FWUC statues - research techniques on sustainable use of water resources - provide technical and financial support for the development and rehabilitation of irrigation systems	- further develop natural resources and environmental management skills, hydrological and administration professionals/ capacity - understand water, fisheries, environment and other related water policies	- research and provide training on water uses and FWUC on IWRM, PIMD and on agriculture extension and IPM - provide good lessons learned from one outstanding FWUC to another - train and disseminate information on the importance of sustainable use and conservation of natural resources and environmental protection - conduct research and case studies at a local level - help FWUCs develop databases and disseminate water related information	- provide research/ evidence based training and policy recommendations.
Donors	- provide financial and technical support for irrigation system development and rehabilitation - assist government and concerned agencies in water-agriculture policy development and irrigation governance - disseminate applicable water management principle	- multiple skills in water-agriculture sectors - water policy and guideline development for effective use and management of water and irrigation infrastructures - financial management know-how	- develop short , medium and long term strategy to support water-agriculture	- establish FWUC association (APEX-Committee) for better management of water resources
Others[58]	- provide regulation and technical services and decision making - approve national budget and planning - approve international convention - develop laws and legislation frameworks - seek for funding for irrigation development - M&E	- multiple skills and professionals in water-agriculture related sector - management, leading, decision making skills - knowledge in developing guidelines, policy, strategy, legislation and regulation	- provide policy guidelines	- improve coordination among line ministries - establish and endorse laws and legal frameworks - law enforcement and M&E

Sources: Research Team, NRE, CDRI 2010

57 GRET, CEDAC, CAVAC, IFAD, CDRI, RUPP, ITC, SBK

58 These could be parliament members and government since the result of the provincial meeting revealed that in Kampong Thom and Kampong Chhnang provinces, their relationship with FWUCs is very important in water allocation and management.

Conclusion

Table 1 above suggests that government, parliament, MOWRAM, MAFF, MEF, PDOWRAM, PDAFF and concerned provincial departments (such as PDOWRAM, PDAFF, PDOE, Provincial Department of Rural Development (PDORD), FiA, Project to Support Democratic Development through Decentralisation and Deconcentration (PSDD), etc.), farmers, FWUGs, FWUCs, civil societies, donors, research and education centres are the key stakeholders relevant to water resource governance in Cambodia. The development and management of irrigation systems presents serious governance challenges for them. The formal coordination mechanisms and arrangements between them are still limited, mainly at practical local levels and need to be improved.

In Cambodia, water resources management policy involves a wide range of stakeholders in public and private sectors at different levels. The roles and responsibilities of those water related stakeholders are inter-related but not yet well defined or consistent. Different stakeholders also have different levels of perceptions on the existing water governance arrangements. At local level, FWUCs expect that the complete irrigation infrastructure of the scheme, sufficient technical expertise and financial support by external stakeholders (government, private sector, donors, NGOs and research centres) would sustainably assist them in irrigation management.

The most notable issues found in the study include unclear/overlapping stakeholder roles and responsibilities, disparity among formal stakeholder roles and actual practices, lack of effective feedback mechanisms and lack of coordination and participation at different levels of stakeholders in water and irrigation management. Urgent improvements need to take place to gradually address those issues. Provincial departments and local authorities suggest that one way to achieve such improvements is the establishment of a new coordinating structure at catchment level, such as an irrigation and catchment management sub-committee, would increase the technical expertise to FWUCs and improve coordination networking between FWUCs, LAs and provincial departments.

The new concepts of water resource management such as IWRM, PIMD, IMT and the formation of FWUCs need to be undertaken carefully at the local level and should take into account the existing political, cultural, socio-economic and physical features of the specific area. Although the government has moved towards decentralisation at sub-national levels, it is still slow in the water governance sector and it needs time to reach the desired goals. In many areas of the TSB, local communities still rely on the coordination or support of the political hierarchies, including commune council, district authorities, other concerned institutions, etc to make important decisions. Effective coordination and feedback among concerned stakeholders was found hard to achieve in most cases. The TWGAW also acknowledges that some gaps, overlaps and poor coordination of functions are found within the present public administration reforms and require remedies.

Much needs to be done in terms of the physical infrastructure of existing irrigation schemes. The irrigation system will not be technically and financially feasible if it does not provide real and timely profits to farmers. Therefore, the responsible institutions should expand the profits of irrigation to farmers as much as possible and this can be undertaken by integrating the new technology of water management and agricultural extension.

The present ISF collection methods (obligation, voluntary or urgent-based collections) will no doubt have an impact the effectiveness of the FWUCs' operation. Technical support and IMT capacity building are mostly slow and the FWUCs still have limited knowledge in relation to irrigation and hydrological management or agricultural extension. Accordingly, appropriate hydrological, financial

and other water and agriculture related training supported by a sufficient budget must be planned for improving the FWUCs performance in water management.

While some important legislation such as the sub-decrees on FWUCs, River Basin Management, and Water Allocation and Licensing are in draft, concerned agencies/ stakeholders should build up sound, coordination mechanisms for water resources management. Such mechanisms should be based on existing legal frameworks that reflect the mandate and area of responsibility of the involved institutions. Institutional interventions based on individual benefit or which are reputation driven will not help to improve water allocation and FWUC operations. Instead, these interventions lead to ineffective water management, overlapping roles and responsibilities of concerned institutions and conflict among water user groups and communities.

Actions to resolve inconsistent activities among important stakeholders at the national and sub-national levels such as MOWRAM, PDOWRAM, provincial departments, LAs and FWUCs should be done. Options include creating the above-proposed River Basin Organisation or a River Basin Sub-committee, and considering or taking steps on the recommended activities described below.

Recommendations

The research has arrived at a conclusion that **there needs to be some kind of structure to improve coordination at the catchment or provincial level which could also increase the technical expertise available to** support FWUCs, line agencies and other groups, without removing their authority to make decisions about their own resources. On the basis of the stakeholder responses, this paper outlines a new coordination structure at the sub-national level, which might be referred to as the Irrigation and Catchment Management Sub-committee (ICMSC).

There are a number of different forms that the sub-committee could take. To stimulate informed discussion and allow for flexibility, the recommendations below explain the aims and functions of the sub-committee and identify the key options and considerations to setting up said sub-committee. The considerations ensure that past lessons inform the development of the new structure and that the changes support rather than duplicate existing structures or resources. It is also to stimulate discussion towards a consensus about how the proposed sub-committee can be given an effective mandate and remain transparent without diminishing the important local role and authority of the newly established FWUCs.

These policy recommendations were discussed during the community level consultations and refined through a series of provincial level workshops with farmers, FWUCs and representatives from PDOWRAM. They aim to address fundamental issues relating to the local implementation of the D&D and IWRM policies as identified in the stakeholder analysis.

Recommendation 1: Irrigation and Catchment Management Sub-committee (ICMSC)

Irrigation and Catchment Management Sub-committees (ICMSCs) should be created at the sub-national level to support the coordination of FWUCs, provincial departments and local authorities in making decisions on integrated water resources, planning, development and management at the catchment level. The sub-committee would assist in building a common understanding among FWUCs, LAs, and provincial departments about IWRM and D&D policy and support the spatial integration of upstream and downstream communities. They would provide a basis for the development of the new governance structures anticipated under the government's river basin management policy.

Functions of ICMSC

The ICMSC would:

- Promote 'bottom-up' processes for small and medium scale irrigation scheme management and development projects within a river basin context taking into account the principles of IWRM, the interests of all stakeholders and the sustainability of natural resources;
- Collaborate with concerned institutions (MOWRAM, MAFF, PDOWRAM, PDAFF, etc), CSOs, provincial governors, LAs, academic and research centres (CDRI, ITC, RUPP, RUA, foreign universities, etc) and donors (ADB, AFD, WB, JICA etc) to seek technical and financial support;
- Provide an avenue to channel additional technical expertise, including inter-disciplinary advice from different provincial departments, NGOS, donors and external experts on

hydrology and IWRM so that the sub-committee may function as a "service centre" for the FWUCs;

- Offer a forum for to raise funds and receive advice from NGOS and donors;
- Set in place an opportunity to resolve conflicts between schemes and for FWUCs to jointly plan their cropping and harvesting activities through an informed process based on hydrological and social knowledge;
- Conduct monitoring, evaluation and impact assessment of water related activities, water policies and of the effectiveness of sub-committee activities using a participatory approach.

Considerations

In determining the governance structure of the ICMSC, careful consideration should be given to the following:

- *Lead agency and subcommittee members:* Determining the appropriate government agency and level to lead the sub-committee is important. Consideration should be given to whether it is best managed at a provincial and/or catchment level, and whether a given line agency should chair the sub-committee or whether this is best done by the Provincial Office, taking into account the RGC's national policies on IWRM and D&D Reform.
- *Mandate and authority:* the sub-committee needs a full and effective mandate but one that is transparent and does not usurp the decision-making powers of FWUCs and other relevant agencies. Mechanisms for downward accountability are important so that the FWUCs are represented, are able to access the technical and financial support that is channelled through the sub-committees, and are able to call on the sub-committees to exercise authority when negotiation, arbitration and coordination between FWUCs is required. It may be necessary for the sub-committee to have an advisory role, rather than full authority to decide on water allocations at a scheme and catchment level, so that local communities retain ultimate control over key decisions.[59]
- *Variation between catchments and schemes:* Situating the sub-committee at a provincial/ catchment level provides a more context-specific structure in which authority could be mustered to make decisions about water resources and irrigation by FWUCs, LAs and Provincial Departments. However, in each location the sub-committee may take a different 'shape', depending on the nature of the catchment and the capacity of existing stakeholders. The structure of each ICMSC will depend on the level of capacity/ expertise in each location and may need to be tailored to individual catchments depending on whether they appropriately overlap with provincial government jurisdictions.
- *Further stakeholder consultation:* The sub-committee should only be established once there has been a process of joint study, action or consultation. They should not be imposed simultaneously as "shells" without underlying stakeholder involvement. The process of establishing the sub-committee requires facilitation and is integral to their success.

59 The stakeholders who supported the introduction of a new sub-committee to manage water resources at the catchment level include the farmers, FWUCs, local authorities (village and commune leaders, district governors, provincial officials and the deputy provincial governor), government institutions and NGOs who participated in the provincial workshops conducted in Pursat, Kampong Thom and Kampong Chhnang provinces, February to April 2010.

Recommendation 2: Education and Training

Provide training to local stakeholders, especially PDOWRAM staff, Commune Councils, farmers and FWUC committee members on important laws/policies, so that they are aware of their rights and duties when using natural resources. The training should cover:

- Water, Forestry, Fishery, Land and Environment Law;
- D&D and PIMD policies
- Organic Law[60]; and
- Administrative Regulations and Guidelines.

Recommendation 3: Building Local Management Leadership and Capacity

Build up the capacity of FWUC committees and commune councils so that they manage their resources properly and are able to lead their communities well. Greater capacity is needed in relation to:

- Leadership, facilitation and communication skills;
- Budget allocation and financial management;
- Natural resources management;
- Project development and management;
- Irrigation and farming systems.

Recommendation 4: Improving FWUC Accountability

Improve FWUC and LA accountability through strong organisational coordination. FWUC committees have to work according to the roles and duties set in its statute, despite the limited support funds. Key areas to take into account include:

- Encouraging farmers to be aware of the importance of ISF and to satisfactorily participate in O&M for sustainable irrigation systems;
- Informing and engaging farmers to participate in irrigation management and development early and at every stage;
- Expanding the profit of irrigation to farmers by seeking new/suitable technology for water management and agricultural extension so that farmers get more products and income; and
- Provide timely water and agricultural information and engage farmers to value common interests.

Recommendation 5: Greater Coordination over the Tonle Sap Basin

Decentralisation in water resources management cannot be achieved if stakeholders, especially farmers, are not well informed and not participating in protecting and maintaining their common property. Some important issues that LAs and concerned institutions within the Tonle Sap Basin should consider are:

---

60 Law on the Administrative Management of the Capital, Provinces, Municipalities, Districts and Khans, RGC 2008.

- Working towards a shared understanding of D&D and PIMD principles among stakeholders;
- Delegating appropriate levels of responsibilities such as planning, implementation, management and decision making in water resources management and development to local level communities (FWUC), CSOs, private sector, etc to increase local involvement;
- Allocating operational and administrative funds to support local level community functions including accountability and financing/co-financing; and
- Reforming and improving stakeholder participation at the Tonle Sap Basin level, more broadly than the sub-committee members, by increasing coordination with local communities, CSOs, private sector and provincial line agencies to prioritise critical and urgent issues and provide a timely and reasonable response to them.

Recommendation 6: Proposed Further Research

The case studies and the provincial workshop in the three provinces suggested that the integration of CC in the structure of the FWUCs (as FWUC committee members) would assist to maintain the legal functions and operation of the FWUCs. Some local stakeholders had mentioned that this integration may also build up the role and accountability of the FWUC committees by:

a. Empowering FWUCs in their irrigation management roles;

b. Facilitating and coordinating with key relevant stakeholders;

c. Enhancing water and agricultural policy/information sharing;

d. Improving the quality of planning and decision making processes in any investment/ development projects; and

e. Reducing potential conflict between LAs and increasing public trust and participation.

In the above regard, future research could address the following:

a. How can FWUCs and CCs improve farmer participation or community-based approaches in water resource management to ensure the sustainability of irrigation schemes?

b. In the context of irrigation and catchment governance, how can PIMD and D&D policies are implemented effectively?

c. How can government-donor-community-private sector partnerships in irrigation water management be developed? What are the most effective mechanisms to strengthen such partnerships?; and

d. Should CC members be included in the management structures of FWUC committees to provide technical support and authority?

Bibliography

Ackerman, J. (2004), "Co-governance for accountability: Beyond 'exit' and 'voice'", *World Development*, Vol. 32 (3), pp. 447-463

Asian Development Bank (2003), "Water Sector Roadmap: Kingdom of Cambodia", http://www.adb.org/Water/CFWS/Roadmap-CAM.pdf (accessed 20 October 2010)

Asian Development Bank (2009a), "Effectiveness of Participatory Approaches: Do the New Approaches Offer an Effective Solution to the Conventional Problems in Rural Development Projects?" http://www.adb.org/Documents/Reports/Evaluation/sst-reg-2005-01.pdf (accessed 28 December 2010)

Asian Development Bank (2009b), "Cambodia: Stung Chinit Irrigation and Rural infrastructure Project", http://www.adb.org/Documents/PCRs/CAM/29257-CAM-PCR.pdf (accessed 1 November 2010)

Asian Development Bank (2009c), "Country Operations Business Plan 2009-2012", http://www.adb.org/Documents/CPSs/CAM/2009-2012/COBP-CAM-2009-2012.pdf (accessed 1 November 2010)

Asian Development Bank (2010), "Water Resources Management Sector Development Programme" (RRP CAM 38558), http://www.adb.org/Documents/RRPs/CAM/38558/38558-02-cam-dc.pdf (accessed 1 November 2010)

Bagadion, B.U. & F.F. Korten (1991), "Developing Irrigators' Organisations: A Learning Process Approach", in M.M. Cernea (ed.) *Putting People First: Sociological Variables in Rural Development* (New York: Oxford University Press)

Boru, D., A. Sophie, T.H. Graham & M. Ronald (2008), "Participatory Impact Pathways Analysis: A Practical Method for Project Planning and Evaluation", http://boru.pbworks.com/f/PIPA-ILAC-Brief-pre-print.doc (accessed 3 January 2011)

Bryson, J. M. (2003), "What To Do When Stakeholders Matter: A Guide to Stakeholder Identification and Analysis Techniques", paper presented at the London School of Economics and Political Sciences, 10 February 2003

Cambodia Development Resource Institute (2010), *Empirical Evidence of Irrigation Management in the Tonle Sap Basin: Issues and Challenges*, Working Paper No. 48 (Phnom Penh: CDRI)

Chevalier, J. M. (2002), "Natural Resource Project/Conflict Management: Stakeholders Doing 'Class' Analysis", in F. Yoshitaro *et al.* (eds.), *Evolving Concept of Peace-building: Natural Resource Management and Conflict Prevention* (Tokyo, Japan: Foundation for Advanced Studies on International Development)

Chou. C. (2009), "Local Governance of Common Pool Research: The Case Study of Irrigation Water in Cambodia", Vol. 13, Issue 4, October 2009 (Phnom Penh: CDRI)

Clever, F. and Franks, T. (2005), "Water Governance and Poverty: A Framework for Analysis", Research Paper No.13, Bradford Centre for International Development, University of Bradford, UK.

Cooke & U. Kothari (eds.) *Participatory: The New Tyranny?* (London; New York: Zed Books)

Cooke, B. & Kothari, U. (eds.) (2001) "Participation: The New Tyranny?" (London: Zed Books).

Coward, E.W. (1991), "Planning Technical and Social Change in Irrigated Areas," in M.M. Cernea (ed.), *Putting People First: Sociological Variables in Rural Development* (New York: Oxford University Press)

Edmunds D. & E. Wollenberg (2001), "A Strategic Approach to Multi-stakeholder Negotiations", *in Development and Change* Vol. 32 (2001), pp. 231-253, Institute of Social Studies

FAO (1997), "Guide for the conduct of the constraints analysis component, Participatory survey methods for gathering information", http://www.fao.org/docrep/W8016E/w8016e01.htm#stakeholder%20analysis (accessed 22 December 2010)

Fitzgerald, I. & Sovannarith, S. (2007), "Moving out of Poverty: Trends in Community Well-being and Household Mobility in Nine Cambodian Villages"(Phnom Penh: CDRI)

Freeman, R. E. (1994), "The politics of stakeholder theory: Some future directions", *Business Ethics Quarterly,* Vol. 4, pp. 409-421

Gilfillan, Beth (2010), *Coercion and Resistance: International Aid in Cambodia* (Saarbrucken, Germany: VDM Publishing).

Global Water Partnership (2000), "Integrated Water Resources Management, Technical Advisory Committee Background Papers", No. 4, Stockholm, Sweden http://www.gwptoolbox.org/images/stories/gwplibrary/background/tac_4_english.pdf (accessed 2 June 2011)

Grace, M. (2009), "Moving Blindly towards Integrated Water Resources Management? Challenges and Constraints facing Cambodia's New Water Law", *Asia Pacific Journal of Environmental Law*, Vol. 12, Issue 1, Sydney, Australia

Grimble, R. & K. Wellard (1997), "Stakeholder Methodologies in Natural Resource Management: A review of principles, contexts, experiences and opportunities", Agricultural *Systems Journal,* Vol.55 (2), pp. 173-193

Hofman, B. & K. Kaiser (2006), Decentralisation, Democratic Transition, and Local Governance in Indonesia, in P. Bardhan & D. Mookherjee (eds.), *Decentralisation and Local Governance in Developing Countrie*s (Cambridge, Massachusetts; London: The MIT Press)

Isham, J. & K. Satu (1998), "The Institutional Determinants of the Impact of Community-based Water Services: Evidence from Sri Lanka and India", background paper for the Operations Evaluation Department, World Bank

Jack, Kelsey (2010), "Barriers to the Adoption of Agricultural Technologies in Developing Countries", Agricultural Technology Adoption Initiative, Draft whitepaper paper for JPAL http://are.berkeley.edu/courses/ARE251/fall2009/Papers/ATAIwhitepaper111409.doc (accessed 31 December 2010)

Keskinen, M. & Sithirith, M. (2009), "Tonle Sap Lake and its Management: The Diversity of Perspectives and Institutions", research paper on improving Mekong water allocation project (PN67), http://www.mpowernet.org/mweb.php?pg=208 (accessed 4 January 2011)

Koma, Y.S., K. Sophanna & T. Try (2009), "CEDAC M-Power meeting report: Summary Report on Activities Completed in 2008 and Plan for 2009", http://www.sea-user.org/download_pubdoc.php?doc=4785 (accessed 16 November 2009)

Lee, T. R. (1999), *Water Management in the 21st Century: The Allocation Imperative* (Cheltenham; Northampton: Edward Elgar)

MAFF (2009), "Agriculture Related Social Safety-net: A response to Global Financial Crisis", paper by H.E. Chan Tong Yves, Secretary of State, presented at the 14th GDCC Meeting of the CDC, Phnom Penh, Cambodia, 28 April 2009 http://www.cdc-crdb.gov.kh/cdc/gdcc/fourteen/session1/presentation_maff.htm (accessed 24 January 2011)

Mak, S. (2007), "Agricultural Extension Overview 2007", (Phnom Penh: DAE-MAFF)

Matsaert, H. (2002), "Institutional Analysis in Natural Resources Research – Socioeconomic Methodologies for Natural Resources Research: Best Practice Guidelines" (Chatham, UK: Natural Resources Institute)

Mekong River Commission (2010), "Stakeholder analysis for the MRC basin development plan programme phase 2 (BDP2): Complementary document to the stakeholder participation and communication plan for the basin development planning in the lower Mekong Basin", final

report, http://www.foodsecurity.gov.kh/otherdocs/BDP-SHA-Final-Mar-2010-Eng.pdf (accessed 16 June 2010)

Mitchell, B. (1990, *Integrated Water Management: International Experiences and Perspectives* (London; New York: Belhaven)

Mitchell, R.K., B.R. Agle & D.J. Wood (1997), "Towards a theory of stakeholder identification: Defining the principle of who and what really counts," *Academy of Management Review,* Vol. 22(4), pp. 853-886

MOE (2006), "Cambodia Environmental Performance Assessment Report 2006: Expenditure on Irrigation System Construction and Maintenance 1999-2003" (Phnom Penh: MOE)

Mollinga, P. P. (2008), Water, politics and development: Framing a political sociology of water resources management, http://www.water-alternatives.org/index.php?option=com_docman&task=doc_download&gid=15 (accessed 4 January 2011)

MOWRAM (1999), Circular No. 1, 11 January 1999 on the "Implementation Policy of Sustainable Irrigation Systems" (Phnom Penh: MOWRAM)

MOWRAM (2009a), "Action Plan on the Management and Development of Water Resources and Meteorology in the Implementation of RGC Rectangular Strategy, Second Step (2009-2013)" (Phnom Penh: RGC)

MOWRAM (2009b), "Lessons Learned and Resolutions on PIMD", paper presented at CEDAC National Workshop, Phnom Penh Hotel, 17 December 2009 (unpublished)

National Institute of Statistics (2008), "General Population Census of Cambodia 2008**,** Final Census Results "(Phnom Penh: Ministry of Planning)

NCDD (2010), National Committee for Decentralisation and Deconcentration Reform, Message from the Chairman http://www.ncdd.gov.kh/component/content/article/30-ncdd/5-message-from-the-chairman (accessed 26 October 2010)

Ostrom, E. (1992), *Crafting Institutions for Self-governing Irrigation Systems* (California, USA: Institute for Contemporary Studies Press)

Overseas Development Administration (1995), "Guidance notes on how to do stakeholder analysis of aid projects and programmes" (London, UK: Social Development Department, ODA)

Perera, L.R. (2006), *Factors Affecting the Formation of FWUCs in Institution building for PIMD in Cambodia: Two Case Studies*, Working Paper No. 113 (Colombo, Sri Lanka: International Water Management Institute) pp.25

Phalla, C. *et al.* (2008), *Framing Research on Water Resources Management and Governance in Cambodia: A Literature Review*, Working Paper No. 37 (Phnom Penh: CDRI)

Ribot, J.C. (2000), "Decentralisation, Participation, and Representation: Administrative Apartheid in Sahelian Forestry", in P.E. Peters (ed.), *Development Encounters: Sites of Participation and Knowledge* (Cambridge, MA: Harvard University Press)

Rowe, G. & L.J. Frewer (2004), "Evaluation of public participation exercises: A research agenda", *Science, Technology, and Human Values*, Vol. 29(4), pp. 512-556

Royal Government of Cambodia (1994), "Roles, Responsibilities and Organisational Structure of Provincial and Municipal Administrations", MoI *Prakas* 1994 (Phnom Penh: RCG)

Royal Government of Cambodia (1999), Royal Proclamation NS/RKM/0699/108, ´Organisation and Function of Ministry of Water Resources and Meteorology" (Phnom Penh: RGC)

Royal Government of Cambodia (2000a), Sub-decree No. 17 SDC, "Role and Function of Ministry of Agriculture, Forestry and Fisheries" (Phnom Penh: RGC)

Royal Government of Cambodia (2000b), Sub-decree No.17 SDC, 7 April 2000, "Organisation and Function of Ministry of Agriculture, Forestry and Fisheries"(Phnom Penh: RGC)

Royal Government of Cambodia (2001), Law on Khum/Sangkat Administrative Management 2001, Article 41 (Phnom Penh: RCG)

Royal Government of Cambodia (2004), "National Water Resources Policy in the Kingdom of Cambodia" (Phnom Penh: MOWRAM)

Royal Government of Cambodia (2005), "Strategic Framework for Decentralisation and Deconcentration Reform" (Phnom Penh: RCG)

Royal Government of Cambodia (2006), Royal Decree No. NS/RD/0806/355, 18 August 2006, "The Establishment of NCDD" (Phnom Penh: RGC)

Royal Government of Cambodia (2007), "Progress in Achieving Cambodia Millennium Development Goals: Challenges and Opportunities", Annual Ministerial Review of the High Level Segment of ECOSOC, Geneva, 2-4 July 2007 (Phnom Penh: MOP)

Royal Government of Cambodia, (2008), Law on "Administrative Management of the Capital, Provinces, Municipalities, Districts and Khans**",** No. NS/RKM/0508/017, dated 22 May 2008 (Phnom Penh: RGC) http://www.ncdd.gov.kh/legal-framework/law (accessed on June 7, 2011)

Royal Government of Cambodia (2009), "Royal Decree on the Establishment of the Tonle Sap Authority", No. NS/RKR/0609/705, 30 June 2009 (Phnom Penh: RGC)

SaciWATERs (2009), "The International Conference on Water Resources Policy in South Asia", report on conference, 17-20 December 2008, Colombo, Sri Lanka, (Andhra Pradesh, India: SaciWATERs), http://www.saciwaters.org/colomboconference/downloads/CONFERENCE%20REPORT%20FINALfor%20Web%20Iridium_web.pdf (accessed 14 February 2011)

Sheldon, T. (ed.) (2005), *River Basin Management: A Negotiated Approach*, (Amsterdam: Both ENDS; Pune, India: Gomukh Publishing)

Sinath, C. (2002), "Investment in Land and Water in Cambodia", proceedings of the Regional Consultation (Bangkok: FAO/RAP), http://webcache.googleusercontent.com/search?q=cache:wx4zzSqiXoYJ:www.fao.org/docrep/005/ac623e/ac623e0c.htm+ISF+collect+guideline,+MOWRAM&cd=1&hl=km&ct=clnk&gl=kh (accessed 23 June 2010)

Sneddon, C. & C. Fox (2007), "Power, Development and Institutional Change: Participatory Governance in the Lower Mekong Basin", *World Development*, Vol. 35(12), pp. 2161-2181

Sokhem, P. & K. Sunada (2006), "The Governance of the Tonle Sap Lake, Cambodia: Integration of Local, National and International Levels", *Water Resources Development*, Vol. 22, No. 3, pp. 399–416, http://www.sea-user.org/UserFiles/File/docs/Sokhem%26Sunada_Fisheries_Session_draft_270606(1).pdf **(**accessed 4 January 2011)

Sokhem, P. (2010),. "Cambodian and Mekong Water Resources Governance", in J. Sato (ed.) *Transboundary Resources and Eenvironment in Mainland Southeast Asia*, Institute for Advanced Studies on Asia, the University of Tokyo

Stoker, G. (1998), *Governance as Theory: Five Propositions* (Oxford, UK: Blackwell Publishers) http://classwebs.spea.indiana.edu/kenricha/Oxford/Archives/Oxford%202006/Courses/Governance/Articles/Stoker%20-%20Governance.pdf (accessed 28 December 2010)

TWGWA (2007), "Strategy on Agriculture and Water" (Phnom Penh: TWGWA)

UNCED (1992), United Nations Conference on Environment and Development (UNCED), The Earth Summit "Agenda 21", Rio de Janeiro, 3-14 June 1992 http://www.un.org/esa/dsd/agenda21/res_agenda21_18.shtml (accessed 2 June 2011)

UNESCAP (2009), *Participatory Approaches to Rural Development and Rural Poverty Alleviation,* Working Paper http://www.unescap.org/pdd/publications/poverty_and_development/participatory_rural.pdf (accessed 28 December 2010)

UNESCAP (2011), "What is Good Governance?" http://www.unescap.org/pdd/prs/ProjectActivities/Ongoing/gg/governance.pdf (accessed 26 January 2011)

Veldwisch, G.J. (2006), "Local Governance Issues after Irrigation Management Transfer: A Case Study from Limpopo Province, South Africa", in S. Perret, S. Farolfi & R. Hassan R. (eds.), *Water Governance for Sustainable Development: Approaches and Lessons from Developing and Transitional Countries* (London: Earthscan)

World Bank (2004), "Volume 1, Decentralized Systems: Case Studies of International Initiatives", (Washington DC: World Bank), http://www.g-fras.org/fileadmin/UserFiles/Documents/Case-studies/Decentralized-Systems.pdf**,** (accessed 28 December 2010)

World Bank Group (2001), "The World Bank's Experience with Local Participation and Partnerships: Lessons from an OED Evaluation, The World Bank Group" http://www.worldbank.org/html/oed/partnershipconference/images/warren-wicklin.pdf (accessed 30 December 2010)

Appendices

Appendix A1: Meeting and Discussion Topics, and Key Informants

1. Meeting/discussion topics

1. Please outline the main role of your agency/organisation with respect to irrigation development and management and/or catchment management.
2. What is your agency's analysis of the key challenges, successes and failures of irrigation development and management in Cambodia?
3. What is your agency's analysis of the key challenges, successes and failures of catchment management in Cambodia?
4. Please describe the main areas of cooperation between your agency and others in the field of irrigation management and catchment management. What are the challenges involved in cooperating between agencies and between different levels of the same line agency?
5. In the experience of your agency, what are the challenges of decentralised irrigation management, particularly regarding the role of Farmer Water User Communities (FWUCs)?
6. What is the role and experience of using economic instruments, participatory management and other approaches to manage water in rural Cambodia?
7. When speaking of water resources development and management in Cambodia, what are the main areas of scarcity and competition over resources (financial, natural, human)?
8. What are some of the key areas of competition and conflict in the field of irrigation and catchment management in Cambodia? What means are there to deal with and resolve conflict?
9. In your agency's work on water resource development and management in the context of irrigation and/or catchments, please describe your primary objectives in terms of economic output, equality of access to water, and environmental sustainability.
10. How well aligned are donor expectations, your agency's objectives and experience, and implementation at the local level?
11. A number of institutional innovations have been implemented in Cambodia over the past decade, notably FWUCs, river basin organisations, the Technical Working Groups and water law reform. What is your assessment of how well these work?
12. Are there any other areas of water governance relevant to irrigation development and management and to catchment management that you would like to discuss?

2. Key Informants

No.	Date & time	Ministry/agency	Person to be met/ interviewed	Venue
	23 Mar 2009	MOWRAM	FWUC Dept. Director	MOWRAM office
	15 Oct 2010	MAFF	Farming system assistant, DAE	CDRI office
	8 Dec 2009	NCDD	NREM Programme Support Team	NCDD, MOI
	13 Sept 2010	PSDD	NRE & PSDD	Pursat
	18 Dec 2009	ADB	Project implementation officer	ADB office
	9 Dec 2009	FACT	Executive director	FACT
	8 Dec 2009	CEDAC	Irrigation System and Community Coordinator	GRET
	8 Dec 2009	GRET	Coordinator, ISC Project	GRET
	8 Dec 2009	Tonle Sap Authority	Permanent vice-chairman and the secretary general	TSA
	11 Dec 2009	PDOWRAM, Kompong Chhnang	Director	PDOWRAM office
	4 Jan 2010	PDOWRAM, Kompong Thom	Chief officer	PDOWRAM office
	4 Jan 2010	PDAFF, Kompong Thom	Director	PDAFF office
	27 Jan 2010	PDOWRAM, Pursat	Director	PDOWRAM office
	27 Jan 2010	PDAFF, Pursat	Director	PDAFF office
	11-14 Nov 2009	Commune council, FWUC and FGDs in Kompong Chhnang	Commune councillors, FWUC members and FGD participants	Pok Pen, Svay Chek, Tang Krasaing and Trapaing Trabek irrigation schemes
	2-5 Jan 2010	Commune Council, FWUC and FGDs in Kompong Thom	Commune councillors, FWUC members and FGD participants	Rolous, Chinith and O Svay irrigation schemes
	26-29 Jan 2010	Commune Council, FWUC and FGDs in Pursat	Commune councillors, FWUC members and FGD participants	Damnak Ampil, Kampang and Wat Leap irrigation schemes

Appendix A2: Major Development Partners

Development Partner	Project Name	Duration	Amount
Water Resources Management Policy, and Institutional Capacity Building			
ADB	Agriculture Sector Programme	1996–2000	$30.0 million (Loan)
AFD	Support for the Development of Agriculture and Water Sector Policies	2006-2009	$1.5 million (Grant)
AFD	Northwest Irrigation Sector project	2004-2010	€ 4 million
Australia	Water Resource Management Research Capacity Development Programme	2006-2011	A$ 2.99 million
FAO	Strengthening the Participatory Irrigation Management and Development Strategy	2007-2009	$ 0.375 million
JICA	Technical Services Centre for Irrigation Systems, phase I and II	2001-5 2006-9	$5.0 million
KOICA	Master plan of water resources development in Cambodia	2006-8	$1.5 million
UK (DfID)	Natural Resource Management and Livelihoods programme	2006 - 2010	£13.6 million
UNDP, GEF, the Netherlands	Mekong River basin wetland conservation and sustainable use programme	Ongoing	$31.5 million
Projects (including preparation studies) – Integrated Water Resource Management, Irrigation, Flood Control, Water supply and sanitation			
ADB	Tonle Sap Environmental Management Project	2003-2008	$19.3 million
ADB	Emergency Flood Rehabilitation Project, rural infrastructure and irrigation and flood control components	2001-3	$10.8 million (irrigation and flood), $6.4 million (rural infrastructure)
ADB	PPTA Second Rural Water Supply and Sanitation Sector Project	2008–2009	$0.6 million
ADB	PPTA Water resources management sector	2007–2010	$1.56 million
ADB, AFD	Stung Chinit irrigation and rural infrastructure	2001–2006	$23.8 million
ADB, AFD	Northwest Irrigation Sector (NWISP)	2005–2010	$22.6 million
AFD	Rehabilitation of Prey Nup polders	2002–2008	€3.8 million
Australia	Cambodia Agriculture Value Chain Programme (CAVAC)	2007–2012	A$45 million
China	Stung Staung Water resources development	2005–2008	n.a.
India	Rehabilitation West Baray Irrigation scheme	2005–2008	$5.0 million
Japan	Project for the Rehabilitation of the Kandal Stung Irrigation System	2005–2008	Y 1,740 million (grant)
Japan	Study – Comprehensive Agricultural Development of Prek Thnot River Basin	2003–2008	Y 423.353 million
Japan	The Basin-Wide Basic Irrigation and Drainage Master Plan Study	2007–2009	Y 147.914 million
Japan	Rehabilitation of small irrigation rehabilitation projects in Kampong Cham Takeo, Kandal, Pursat and Kratie Provinces	2008–2009	$0.35 million

Development Partner	Project Name	Duration	Amount
Japan	Improvement of Agricultural River Basin Management ad Development Project (TSC3)	2009–2014	$0.72 million
Japan	The Project for Rehabilitating Boeung Veam Irrigation System in Kampong Cham Province	2010–2011	$0.096 million
Japan	The Project for Rehabilitating Kbal Tonsoung Irrigation System in Kampong Cham Province	2008–2009	$0.085 million
Japan	The Project for Rehabilitating Portasu Irrigation in Takeo Province	2009–2011	$0.175 million
Japan	The Project for Rehabilitating Thanal Cham Reservoir in Kandal Province	2008–2009	$0.085 million
Japan	The Project for Rehabilitation of Toul Kou Irrigation in Pursat Province	2007–2008	$0.080 million
Japan	The Project of Rehabilitation of Bos Leave Irrigation System in Kratie Province	2007–2008	$0.086 million
Japan/Republic of Korea	The JICA/KOICA Joint Programme for the Rehabilitation of Irrigation System and Rural Community Development in Cambodia	Jun 2009– Dec 2009	$0.30 million
JICA, APS (Italy), WFP	Kamping Pouy irrigation rehabilitation and rural development	1998–2006	$5.6 million
Republic of Korea	Krang Ponley Water Resources Development Project	2006–2010	$27 million
Republic of Korea	Construction of irrigation System in Batheay District	2009–2010	$2.5 million
Republic of Korea	Tamauk Irrigation Rehabilitation Project	2002–2004	$1.9 million
Republic of Korea	Multi-purpose water resources development, Krang Ponley	2004–2009	n.a
Republic of Korea	Multi-purpose dam development, Battambang	2006–2007	n.a
UNDP	Promoting Climate-resilient Water Management and Agriculture in Rural Cambodia	2009–2013	$4.09 million
World Bank	Provincial and Peri-Urban Water Supply and Sanitation Project	2003– on going	$23.0 million (including IDA)

Source: ADB 2010, accessible on 11/2/2010 at: http://www.adb.org/Documents/RRPs/CAM/38558/38558-02-cam-dc.pdf

CDRI Working Paper Series

1) Kannan, K.P. (November 1995), *Construction of a Consumer Price Index for Cambodia: A Review of Current Practices and Suggestions for Improvement***.**
2) McAndrew, John P. (January 1996), *Aid Infusions, Aid Illusions: Bilateral and Multilateral Emergency and Development Assistance in Cambodia.* 1992-1995.
3) Kannan, K.P. (January 1997), *Economic Reform, Structural Adjustment and Development in Cambodia.*
4) Chim Charya, Srun Pithou, So Sovannarith, John McAndrew, Nguon Sokunthea, Pon Dorina & Robin Biddulph (June 1998), *Learning from Rural Development Programmes in Cambodia.*
5) Kato, Toshiyasu, Chan Sophal & Long Vou Piseth (September 1998), *Regional Economic Integration for Sustainable Development in Cambodia.*
6) Murshid, K.A.S. (December 1998), *Food Security in an Asian Transitional Economy: The Cambodian Experience.*
7) McAndrew, John P. (December 1998), *Interdependence in Household Livelihood Strategies in Two Cambodian Villages.*
8) Chan Sophal, Martin Godfrey, Toshiyasu Kato, Long Vou Piseth, Nina Orlova, Per Ronnås & Tia Savora (January 1999), *Cambodia: The Challenge of Productive Employment Creation.*
9) Teng You Ky, Pon Dorina, So Sovannarith & John McAndrew (April 1999), *The UNICEF/ Community Action for Social Development Experience—Learning from Rural Development Programmes in Cambodia.*
10) Gorman, Siobhan, with Pon Dorina & Sok Kheng (June 1999), *Gender and Development in Cambodia: An Overview.*
11) Chan Sophal & So Sovannarith (June 1999), *Cambodian Labour Migration to Thailand: A Preliminary Assessment.*
12) Chan Sophal, Toshiyasu Kato, Long Vou Piseth, So Sovannarith, Tia Savora, Hang Chuon Naron, Kao Kim Hourn & Chea Vuthna (September 1999), *Impact of the Asian Financial Crisis on the SEATEs: The Cambodian Perspective.*
13) Ung Bunleng, (January 2000), *Seasonality in the Cambodian Consumer Price Index.*
14) Toshiyasu Kato, Jeffrey A. Kaplan, Chan Sophal & Real Sopheap (May 2000), *Enhancing Governance for Sustainable Development.*
15) Godfrey, Martin, Chan Sophal, Toshiyasu Kato, Long Vou Piseth, Pon Dorina, Tep Saravy, Tia Savara & So Sovannarith (August 2000), *Technical Assistance and Capacity Development in an Aid-dependent Economy: the Experience of Cambodia.*
16) Sik Boreak, (September 2000), *Land Ownership, Sales and Concentration in Cambodia.*
17) Chan Sophal, & So Sovannarith, with Pon Dorina (December 2000), *Technical Assistance and Capacity Development at the School of Agriculture Prek Leap.*
18) Godfrey, Martin, So Sovannarith, Tep Saravy, Pon Dorina, Claude Katz, Sarthi Acharya, Sisowath D. Chanto & Hing Thoraxy (August 2001), *A Study of the Cambodian Labour Market: Reference to Poverty Reduction, Growth and Adjustment to Crisis.*
19) Chan Sophal, Tep Saravy & Sarthi Acharya (October 2001), *Land Tenure in Cambodia: a Data Update.*
20) So Sovannarith, Real Sopheap, Uch Utey, Sy Rathmony, Brett Ballard & Sarthi Acharya (November 2001), *Social Assessment of Land in Cambodia: A Field Study.*

21) Bhargavi Ramamurthy, Sik Boreak, Per Ronnås and Sok Hach (December 2001), *Cambodia 1999-2000: Land, Labour and Rural Livelihood in Focus.*

22) Chan Sophal & Sarthi Acharya (July 2002), *Land Transactions in Cambodia: An Analysis of Transfers and Transaction Records.*

23) McKenney, Bruce & Prom Tola. (July 2002), *Natural Resources and Rural Livelihoods in Cambodia.*

24) Kim Sedara, Chan Sophal & Sarthi Acharya (July 2002), *Land, Rural Livelihoods and Food Security in Cambodia.*

25) Chan Sophal & Sarthi Acharya (December 2002), *Facing the Challenge of Rural Livelihoods: A Perspective from Nine Villages in Cambodia.*

26) Sarthi Acharya, Kim Sedara, Chap Sotharith & Meach Yady (February 2003), *Off-farm and Non-farm Employment: A Perspective on Job Creation in Cambodia.*

27) Yim Chea & Bruce McKenney (October 2003), *Fish Exports from the Great Lake to Thailand: An Analysis of Trade Constraints, Governance, and the Climate for Growth.*

28) Prom Tola & Bruce McKenney (November 2003), *Trading Forest Products in Cambodia: Challenges, Threats, and Opportunities for Resin.*

29) Yim Chea & Bruce McKenney (November 2003), *Domestic Fish Trade: A Case Study of Fish Marketing from the Great Lake to Phnom Penh.*

30) Hughes, Caroline & Kim Sedara with the assistance of Ann Sovatha (February 2004), *The Evolution of Democratic Process and Conflict Management in Cambodia: A Comparative Study of Three Cambodian Elections.*

31) Oberndorf, Robert B. (May 2004), *Law Harmonisation in Relation to the Decentralisation Process in Cambodia.*

32) Murshid, K.A.S. & Tuot Sokphally (April 2005), *The Cross Border Economy of Cambodia: An Exploratory Study.*

33) Hansen, Kasper K. & Neth Top (December 2006), *Natural Forest Benefits and Economic Analysis of Natural Forest Conversion in Cambodia.*

34) Pak Kimchoeun, Horng Vuthy, Eng Netra, Ann Sovatha, Kim Sedara, Jenny Knowles & David Craig (March 2007), *Accountability and Neo-patrimonialism in Cambodia: A Critical Literature Review***.**

35) Kim Sedara & Joakim Öjendal with the assistance of Ann Sovatha (May 2007), *Where Decentralisation Meets Democracy: Civil Society, Local Government, and Accountability in Cambodia***.**

36) Lim Sovannara (November 2007), *Youth Migration and Urbanisation in Cambodia***.**

37) Chem Phalla et al. (May 2008), *Framing Research on Water Resources Management and Governance in Cambodia: A Literature Review***.**

38) Pak Kimchoeun and David Craig (July 2008), *Accountability and Public Expenditure Management in Decentralised Cambodia.*

39) Horng Vuthy and David Craig (July 2008), *Accountability and Planning in Decentralised Cambodia.*

40) ENG Netra and David CRAIG (March 2009), *Accountability and Human Resource Management in Decentralised Cambodia***.**

41) Hing Vutha and Hossein Jalilian (April 2009), *The Environmental Impacts of the ASEAN-China Free Trade Agreement for Countries in the Greater Mekong Sub-region***.**

42) Thon Vimealea, Ou Sivhuoch, Eng Netra and Ly Tem (October 2009), *Leadership in Local Politics of Cambodia: A Study of Leaders in Three Communes of Three Provinces*.

43) HING Vutha and THUN Vathana (December 2009), *Agricultural Trade in the Greater Mekong Sub-region: The Case of Cassava and Rubber in Cambodia.*

44) Chan Sophal (December 2009), *Costs and Benefits of Cross-border Labour Migration in the GMS: Cambodia Country Study.*

45) CDRI Publication (December 2009), *Costs and Benefits of Cross-country Labour Migration in the GMS: Synthesis of the Case Studies in Thailand, Cambodia, Laos and Vietnam.*

46) CDRI Publication (December 2009), *Agricultural Trade in the Greater Mekong Sub-region: Synthesis of the Case Studies on Cassava and Rubber Production and Trade in GMS Countries*

47) Chea Chou (August 2010), *The Local Governance of Common Pool Resources: The Case of Irrigation Water in Cambodia*

48) CDRI Publication (August 2010), *Empirical Evidence of Irrigation Management in the Tonle Sap Basin: Issues and Challenges*

49) Chem Phalla and Someth Paradis (March 2011), *Use of Hydrological Knowledge and Community Participation for Improving Decision-making on Irrigation Water Allocation*

50) Pak Kimchoeun (May 2011), *Fiscal Decentralisation in Cambodia: A Review of Progress and Challenges*

51) Christopher Wokker, Paulo Santos, Ros Bansok and Kate Griffiths (June 2011), *Irrigation Water Productivity in Cambodian Rice System*

52) Ouch Chandarany, Saing Chanhang and Phann Dalis (June 2011), *Assessing China's Impact on Poverty Reduction In the Greater Mekong Sub-region: The Case of Cambodia*

53) So Sovannarith, Blake D. Ratner, Mam Kosal and Kim Sour (June 2011), *Conflict and Collective Action in Tonle Sap Fisheries: Adapting Institutions to Support Community Livelihoods*

CDRI - Cambodia's leading independent development policy research institute

☞ 56 Street 315, Tuol Kork, Phnom Penh, Cambodia
✉ PO Box 622, Phnom Penh, Cambodia
☎ (855-23) 881-384/881-701/881-916/883-603/012 867-278
🖷 (855-23) 880-734
E-mail: cdri@cdri.org.kh
Website: http://www.cdri.org.kh

Price: USD2.50
9 789996 352454