



THE 4-P AREA

Prek Preah, Prek Krieng, Prek Kampi
and Prek Te river basins

*Piloting river basin approach to IWRM
in Eastern Cambodia*

A Pilot and Demonstration Activity under
Asian Development Bank RETA 6325:
Promoting effective water policies and practices (Phase 5)

Inception report

December 2007

**Cambodia Water Partnership and
Cambodia National Mekong Committee**

SUMMARY

The 4-P area (Prek Preah, Prek Krieng, Prek Kampi and Prek Te river basins) covers parts of Kratie and Mondulkiri provinces.



ADB, CamboWP and CNMC agree that the area is well suited for a 'Pilot and Demonstration Activity' (PDA). An application from CamboWP and CNMC was approved by a Letter of Agreement signed by ADB on 19 November 2007 (and by CNMC on the following day).

The PDA has a duration of one year with an external funding of US\$ 50,000. It aims to

- 1 develop, in conjunction with provincial and district administrations, appropriate river basin management institutional arrangements;
- 2 raise awareness amongst the provincial and district administrations, and community/farmer/NGO stakeholders of the implications and benefits of good water governance and good IWRM practices and the benefits of inter-agency collaboration;
- 3 undertake resource assessments and scenario analyses relating to medium to long term IWRM planning for the Prek Preah, Prek Krieng, Prek Kampi and Prek Te sub-basins and discuss and debate these with the basin institutional arrangements; and
- 4 provide guidance for future investments and development efforts relating to water management and service delivery.

The PDA builds on preceding work in the same area conducted by CNMC (reported in Jan 05) and by CamboWP and CNMC (reported in June 07).

The present inception report describes the implementation of the PDA. It complies fully with the Letter of Agreement, except for

- activities i) and ii) in the LoA having been split into two (without changing the contents); and
- the mid-term report (to be submitted 2 months after the start of the PDA according to the LoA) having been shifted by 2 months (considering that this report would become fragmented if submitted only one month after the inception report)

ACRONYMS AND ABBREVIATIONS

ADB	Asian Development Bank
BDP	Basin Development Plan (of Mekong River Commission)
CamboWP	Cambodia Water Partnership
CNMC	Cambodia National Mekong Committee
FWUC	farmers water user community
GWP	Global Water Partnership
IWRM	integrated water resources management
LoA	letter of agreement
MAFF	Ministry of Agriculture, Forestry and Fisheries
MOI	Ministry of Interior
MOP	Ministry of Planning
MOWRAM	Ministry of Water Resources and Meteorology
MRC	Mekong River Commission
MRD	Ministry of Rural Development
NCDD	National Committee for Management of the Decentralization and Deconcentration Reforms
PDA	pilot and demonstration activity
PIP	public investment programme
PD...	Province Department ...
PSDD	Project to Support Democratic Development through Decentralization and Deconcentration
RBO	river basin organization
WUG	water user group

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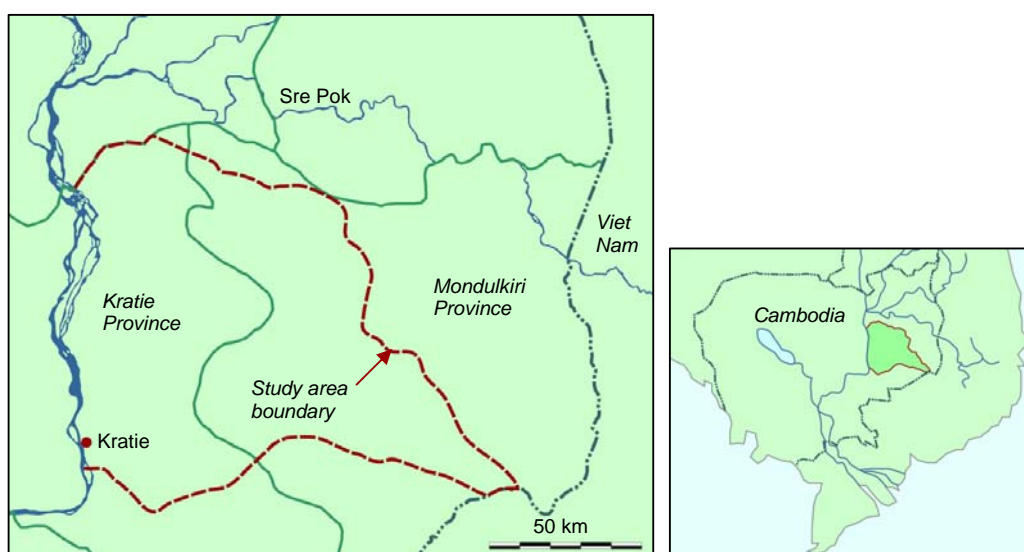
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1 INTRODUCTION

Background and rationale

The 4-P area (Prek Preah, Prek Krieng, Prek Kampi and Prek Te river basins) covers parts of Kratie and Mondulkiri provinces. CamboWP and CNMC have selected this area as a pilot and demonstration area for national IWRM implementation. The area fills a gap between other priority areas for major national and regional water-related development initiatives, such as the Tonle Sap area (with its new river basin authority); the 3-S area (Se Kong, Se San and Sre Pok river basins, shared with Laos and Viet Nam); the coastal zone; and the Delta area (shared with Viet Nam).

Figure 1.1: The 4-P area



ADB, CamboWP and CNMC agree that the area is well suited for a *'Pilot and Demonstration Activity'* (PDA). CamboWP and CNMC submitted a grant application to ADB in August 2007. Following some adjustments of scope and approach, the application was approved by a Letter of Agreement signed by ADB on 19 November 2007 (and by CNMC on the following day). The PDA is implemented under ADB's RETA 6325: Promoting effective water policies and practices (Phase 5) with support from ADB's Cooperation Fund for the Water Sector.¹

Specifications for the PDA are attached as Appendix 1.

Related activities

The PDA builds on two preceding studies of the same area:

¹ The objectives of the PDA program are (a) to support new approaches to processing and implementing ADB technical assistance and loan-financed investment projects, and new approaches to water sector policy development and sector reform; and (b) to improve and promote innovative water sector initiatives implemented by nongovernment organizations (NGOs), development partners and local communities

- Mekong River Commission's Basin Development Plan with its Sub-area 8C. A comprehensive planning report for Sub-area 8C was prepared by CNMC (Jan 05), and the area is further described in the MRC-BDP Planning Atlas (MRC 2006);² and
- The 4-P area. An IWRM-based pilot study of water-related development opportunities, Phase 1: A Functional Water Partnership for the 4-Ps, reported by CamboWP and CNMC in June 2007

Among other closely related activities are four dialogue meetings held by CamboWP and CNMC from December 2006 to September 2007 with the following themes:

- CamboWP establishment
- Improvement of inter-sector communication related to IWRM
- Promoting change by IWRM partnership
- Review of national IWRM strategy and roadmap

Several important related national developments occurred in the first half of 2007:

- The National Water Resources Law (in preparation for nearly a decade) was passed in May 2007
- The Tonle Sap Basin Authority (in preparation for several years) was approved as the country's first river basin authority
- A Joint Strategy for Agriculture and Water 2006-2010 was prepared by Ministry of Agriculture, Forestry and Fisheries and Ministry of Water Resources and Meteorology

These measures will facilitate the implementation of IWRM (and will enhance the need of related capacity-building in general and extended institutional networking in particular).

Another related activity is in the pipeline:

- Community-based development in Kratie province, expected to begin in early 2008, implemented by CamboWP and CNMC with support from GWP

The present inception report

The present inception report provides information about approach and implementation framework.

It has been prepared for an approval (or '*no objection*') from ADB and will serve as a reference for the various participants in the PDA.

² This was part of an exercise that covered the entire country, except the coastal zone

2 IMPLEMENTATION CONTEXT

2.1 Policies and strategies

Important national water-related policies and development planning initiatives are described in the following documents:

- NSDP (Nov 05): National Strategic Development Plan 2006-2010 (draft English translation);
- MOWRAM (Feb 06): Strategic Development Plan 2006-2010 (draft), prepared by Ministry of Water Resources and Meteorology;
- MAFF (Jun 06): National Programme for Household Food Security and Poverty Reduction 2007-2011; and
- MAFF and MOWRAM (Feb 07): Joint Strategy for Agriculture and Water 2006-2010, prepared by Ministry of Agriculture, Forestry and Fisheries and Ministry of Water Resources and Meteorology.

The *Law on Water Resources Management in the Kingdom of Cambodia* was passed by the National Assembly on 22 May 2007.

Other references for national water-related development are

- ADB (Jan 05): Country strategy and program 2005-09, Kingdom of Cambodia;
- MOE (Apr 05): State of the Environment Report 2004, prepared by Ministry of Environment;
- NPRS (Nov 02): National Poverty Reduction Strategy 2003-2005, prepared by Council for Social Development; and
- MOP (Nov 03): Cambodia Millennium Development Goals report 2003³.

Useful guidance at the regional level is available in the

- '*Strategic directions for IWRM in the Lower Mekong Basin*', prepared by MRC under its Basin Development Plan (Dec 05).

2.2 Development planning

The national development planning process is a hierarchy of de-central and national planning, partly by sector, and partly integrated. The levels are (i) the national level; interacting with (ii) the province level; and (iii) the commune level.

The national and ministerial Public Investment Programmes (PIPs) are prepared annually as rolling plans covering a 3-years period.

The Commune Development Plans are presently in a state of early consolidation. These are expected to appear as rolling 5-years development plans with related rolling 3-years investment programmes. The first such plans were prepared with support by the Seila project for 2003-2007

³ Cambodia has defined its own set of Millennium Development Goals. As compared with the Universal Millennium Development Goals, Cambodia applies 7 identical goals, 1 similar goal and 1 new goal (about land mines and UXO), totaling 9 goals; and 9 identical indicators, 9 similar indicators, 1 indicator split into 2, and 6 new indicators, totaling 25 indicators

(with investment programmes covering 2003-2005). They are presently being updated with support from UNDP's *Project to Support Democratic Development through Decentralization and Deconcentration* (PSDD) and the government's National Committee for Management of the Decentralization and Deconcentration Reforms (NCDD).

The commune development planning is affected by sparse capacity and finite funds available for implementation. The plans have some tendency to become fragmented, and to appear as annual operation and maintenance budgets and damage control measures as much as pro-active planning with a wider perspective, a longer time horizon, and a higher development impact. On the other hand, the projects included in the plans have a clear social and socio-economic orientation and (apparently) a high relevance (while, in some cases, the feasibility and the risks are less evident).

The framework contains several *'filters'*. Some of these are *'cost-cutting'*, with the useful purpose of adjusting the total amount of national development costs and routine operating costs to a level that is acceptable for the national budget. Such adjustments (or priority-making) take place during compilation of the national development plans and PIPs, which establish the framework for the ministerial (sector-wise) PIPs. Cost-cutting (or priority-making) may also take place at the district-level screening that takes place of the commune development plans.

Another type of filter is the ministerial development plans, which by their nature are sector-oriented. Cross-sector development initiatives (suggested for example at the commune or province level) may, possibly, be split into sector components to ease their way through the planning cycle, because it is difficult for one ministry to promote suggestions that extend beyond its mandate. For example, the promotion of a proposed road on a flood embankment is more complex than the separate promotions of a road and a flood embankment. Multi-sector initiatives require a collaboration between the involved ministries, and the decision process becomes more long-winded than for single-sector initiatives.

Similarly, the processing of development initiatives becomes much more complex and time-consuming if the activities cover more than one province.

The framework for development initiatives funded (or co-funded) by donors can be simpler. While such activities must comply with the various national policies, they can from case to case by-pass a priority-making that is necessitated by finite public funds. The way towards implementation of a development project is relatively straight if a ministry and a donor agree that it is useful and desirable (even though it needs approval from the Cambodia Development Council). Also for donor-funded development activities, however, the processing is more complicated if more than one ministry and/or more than one province are involved.

2.3 CamboWP

Cambodia Water Partnership (CamboWP) is a network of agencies, institutions, businesses, social entities, professional associations, scientists, NGOs, and water users in the water sector and related management areas. The partnership links with other similar partnerships in SE Asia and with Global Water partnership (GWP).

CamboWP has four objectives:

- 1 To assist line agencies and all stakeholders with IWRM-based water resources management, development and conservation,
- 2 to provide a platform and forum for dialogue between all participants including political and professional levels;

- 3 to exchange, learn and share information and experience for capacity building in IWRM planning and implementation, communication, development and research;
- 4 to help realizing the Government's water policies and strategies by promoting IWRM programmes.

CamboWP supports or undertakes IWRM-related

- dialogues, workshops, conferences and roundtable discussions;
- awareness-raising activities;
- technical and logistical assistance;
- exchange of data, information and materials;
- research, documentation, and development studies/projects;
- local, national, regional and international networking;
- participation by women.

3 THE 4-P AREA

A map of the area is shown as Figure 1.1

Baseline descriptions and assessments of development opportunities have been prepared by CNMC (Jan 05)⁴; MRC (2006)⁵; and CamboWP and CNMC (Jun 07)⁶. All these studies draw on meteorological and hydrological data available from MOWRAM, and social and socio-economic data available from the Commune Database (the latest version covering 2005).

The 4-P area is located on the eastern (or left) bank of the Mekong. It forms a triangle delineated by the Mekong towards west, by the Sre Pok Basin towards northeast, and by the Prek Chhloung Basin towards south.⁷

The provincial town of Kratie is located within the area.

The Mekong mainstream itself is not regarded as a part of the area. This section of the mainstream has its own particular development agenda: The urgent need of bank protection in front of the provincial town of Kratie; the potential for tourism (featuring the Mekong dolphin and other rare species); and the scope for hydropower development (presently being studied at feasibility level).

The area covers some 12,472 km² (which is 6.9 percent of Cambodia's entire area) and has a population of some 143,290 persons (or 1.1 percent of the national population).

Only around one percent of the area is cultivated⁸ (with a quarter of the cultivated areas served by irrigation infrastructure). The major parts are covered by forests, in various states of degradation, and forest plantation.

The majority of people living in the area faces a great burden of poverty and poor social conditions. They are vulnerable to floods and drought, as they are heavily dependent upon agriculture, often conducted on a subsistence basis. The average rice yield ranges from 1.4 to 1.9 tons per ha.

Safe water - whether by piped network, from orderly wells, or bought from vendors - is accessible for 40% of population in Kratie Province and only 25% in Mondulkiri Province. The majority of remote areas have no access at all, and this situation affects people's health and life expectancy. Mondulkiri Province has the highest infant mortality rate in Cambodia (with 125-170 deaths per 1,000 live births). The incidence of malaria is varies between 10 and 100 per 1,000 people per year.

The study area covers a major part of the 222,500 ha Phnom Prich Wildlife Sanctuary and a minor part of the 250,000 ha Lomphat Wildlife Sanctuary.

A distinction can be made between two zones (that are not sharply divided):

⁴ CNMC (Jan 05): Planning report for Sub-area 8C

⁵ MRC (2006): BDP Planning Atlas, Sub-area 8C

⁶ CamboWP and CNMC (Jun 07): The 4-P area. An IWRM-based pilot study of water-related development opportunities, Phase 1

⁷ Remainder of this chapter quoted from CamboWP and CNMC (Jun 07)

⁸ Excluding plantations and orchards

- Along the Mekong mainstream (and including the town of Kratie), the population density is high, and the economy is better developed and more diversified as compared with the inland parts of the study area. Typical livelihoods are lowland farming (cultivation and livestock), capture fisheries, various manufacturing and small-scale industries, trading, and some employment in the service sector, including tourism.
- The inland (and major) parts of the study area are originally forest areas with a relatively sparse population, some spotty cultivation, and various forest-related subsistence livelihoods. There is still some shifting cultivation in this area. The land use is in a state of rapid transition, with large areas being reclaimed for forest plantation, often requiring re-settlement of the population, with a related loss of traditional livelihoods and apparently few and inadequate alternative livelihood options.

Among the many development needs identified by CNMC for the 8-C Sub-area, the following ones may have a particular relevance for the 4-P study area (listed in random order):

- Access to safe water and electricity
- Support to sustainable livelihood development in general and rural livelihoods in particular, for example by development of agricultural extension services; agro-industry processing and handicrafts; and tourism
- Improved land use and land management
- Increased groundwater exploitation for rural water supply
- Irrigation system rehabilitation and development, and expansion of small-scale and medium-scale water storage capacity
- Flood and drought preparedness, warning systems and disaster relief
- Poor soils improvement/management
- Diversification of farming and development of markets
- Increased micro-hydropower infrastructure
- Management plans for protected areas and national parks and critical upper watersheds prepared and implemented
- Promotion and consolidation of agricultural development communities and water user communities
- Export-oriented agro-industry
- Human resources development

Border trade reforms, whether bilateral or regional, can offer new opportunities for economic growth in the area.

4 OBJECTIVES, OUTPUTS AND ACTIVITIES

4.1 Overview

A national Vision for Water has been defined by MOWRAM as follows:⁹

- Access for all to safe, adequate, and affordable drinking water, hygiene, and sanitation
- Freedom for all from the threat of loss of life and livelihood as a result of floods and droughts
- Sufficient water where it is needed, to provide for food security and industrial activity
- A water environment that is unpolluted, and supports healthy fisheries and aquatic ecosystems

The development objective (or over-all objective) of the present PDA is proposed as

Visible progress towards achieving the national vision for water

The following PDA objectives are specified in the Letter of Agreement¹⁰:

- 1 Develop, in conjunction with provincial and district administrations, appropriate river basin management institutional arrangements,
- 2 Raise awareness amongst the provincial and district administrations, and community/farmer/NGO stakeholders of the implications and benefits of good water governance and good IWRM practices and the benefits of inter-agency collaboration,
- 3 Undertake resource assessments and scenario analyses relating to medium to long term IWRM planning for the Prek Preah, Prek Krieng, Prek Kampi and Prek Te sub-basins and discuss and debate these with the basin institutional arrangements,
- 4 Guidance for future investments and development efforts relating to water management and service delivery.

One output has been defined for each of these objectives.

For the sake of overview, a synthesis of outputs, activities and performance indicators is provided in the following table.

A logical framework has been attached as Appendix 2.

⁹ MOWRAM (06): IWRM strategy and roadmap in Cambodia

¹⁰ The numbering has been changed as compared with the Letter of Agreement, but the wording is unchanged

Table 4.1: *Outputs, activities and performance indicators*

Output	Activity	Performance indicator
1 River basin management arrangements & guidelines	1.1 Develop and discuss options for coordinated river basin management across the two provinces	Agreed institutional arrangements with clear operating guidelines implemented
	1.2 Agree on option for project management	
2 Awareness of good IWRM practices and inter-agency collaboration	2.1 Implement pilot community awareness programme	Awareness raising and participation processes in place and operational
	2.2 Establish and implement a public participation model	
3 Assessment of development opportunities and constraints	3.1 Conduct data review, and analysis of opportunities and threats	
	3.2 Prepare inventory of structures and water uses	
4 Action plan with investment opportunities	4.1 Prepare IWRM roadmap with priority studies	Agreed action plan with investment priorities
	4.2 Recommend on institutional arrangements	

4.2 *Outputs and activities*

The following related PDA outputs and principal activities are specified in the Letter of Agreement:¹¹

- 1 A set of river basin institutional arrangements agreed upon by stakeholders early on and piloted in the river basin, including operating guidelines
 - 1.1 Develop options for coordinated river basin management across the two provinces, and various districts in the sub-basins, and
 - 1.2 debate these with line agencies and province/district administrations to determine an agreed institutional option to manage the project
- 2 Awareness raised as to the key IWRM issues facing these stakeholders and public participation modalities demonstrated
 - 2.1 Determine and implement (on a pilot and demonstration basis) a community awareness program for IWRM issues and through this,
 - 2.2 establish and implement a model for public participation in the project at all levels of stakeholders
- 3 A preliminary assessment of relevant issues, opportunities, constraints and scenarios for development possibilities
 - 3.1 Review existing water resource, socio-economic and environmental data and information for the sub-basins, determine gaps in information for IWRM

¹¹ The numbering has been changed as compared with the Letter of Agreement, but the wording is unchanged

- requirements and assess the emerging water, social and environmental problems and the opportunities and threats relating to possible water development
- 3.2 Prepare an inventory of existing water control structures and their current effectiveness, and of water use practices, in the sub-basins/catchments
- 4 An agreed set of resource protection issues and action plan, including investment opportunities
 - 4.1 Discuss and debate with the agreed institutional arrangements the resource issues, problems and opportunities and determine priority studies and investigations to further move toward developing an IWRM plan, or 'roadmap' for the sub-catchments
 - 4.2 Recommend at the end of the project appropriate on-going institutional arrangements that can be implemented to provide a continuing focus of good IWRM in the sub-catchments

4.3 Approach to activities

Activity 1.1: Coordinated river basin management

Develop options for coordinated river basin management across the two provinces and various districts in the sub-basins

Viable modalities will be outlined and discussed with relevant implementation partners at the first meeting in Kratie.

In this connection, the main challenge is to maintain an adequate participation and an adequate information flow among all participants. A potential measure may be to establish a small '*advisory panel*' or '*liaison panel*' with representatives from MAFF, MOWRAM, and Kratie and Mondulkiri province. The panel members would receive draft and final documents prepared under the PDA (which can be further circulated by the panel members) and would be invited to workshops and relevant meetings.

The options will pay due attention to existing coordination bodies and will consider the '*proposed guiding principles*' attached as Appendix 7.

Box 4.1: Examples of institutional stakeholders (province level)

Office of the Governor (inter-sector coordination)

Department of Agriculture, Forestry and Fisheries (primary production, processing, technology, services)

Department of Local Administration (under Ministry of Interior) (commune development planning)

Department of Planning (inter-sector coordination, commune and province level planning)

Department of Water Resources and Meteorology (water resources management, water user groups)

Department of Rural Development

Project to Support Democratic Development through Decentralization and Deconcentration (support to commune development planning and province-level planning)

Results will be carried forward to Activities 1.2 (project management), 4.1 (roadmap) and 4.2 (institutional arrangements).

Activity 1.2: Option for project management

Debate [options for coordinated river basin management across the two provinces] with line agencies and province/district administrations to determine an agreed institutional option to manage the project

Based on the outcome of the dialogue conducted under Activity 1.1, an agreed management modality will be formulated and implemented.

Some initial suggestions on coordinated management are made in Chapter 5 (organization).

Activity 2.1: Pilot community awareness programme

Determine and implement (on a pilot and demonstration basis) a community awareness program for IWRM issues

This activity will proceed as a direct continuation of the Phase 1 study, which conducted stakeholder dialogue on a pilot basis, and established 'Functional Partnerships' for de-central IWRM implementation in the 4-P area. The Functional Partnerships are focal points for dialogue, each one covering one of the four sub-catchments in the 4-P area.

The work will link into the ongoing commune development planning process with its solid de-central perspective. The detailed approach will be coordinated with PSDD activities in the area, and may involve screenings of IWRM-related development needs and opportunities at village and commune level, and preparations for related technical support at the province level.

One immediate outcome of the pilot programme will be additional information about development needs and opportunities, which will be carried forward to Activity 3.1.

Activity 2.2: Public participation model

Establish and implement a model for public participation in the project at all levels of stakeholders ... An early priority will be to develop a community/ stakeholder participation plan, take this to various representative levels of stakeholders and obtain endorsement of the approach

Stakeholder participation adds indispensable relevance and validity to the development process and highly improves the prospects for successful implementation.

According to the Letter of Agreement, '*once the provincial/district institutional options are discussed and agreed, the initial task will be to develop a clear project plan and an early priority will be to develop a community/ stakeholder participation plan, take this to various representative levels of stakeholders and obtain endorsement of the approach. Participation activities will be reported regularly to the peak level institutional arrangements*'.

The Phase 1 Study (CamboWP and CNMC June 07) observed that '*the stakeholder involvement can conveniently lock into the commune planning process and the (new and existing) water user groups. Both are in an early state of consolidation and would highly benefit from support via capacity-building and in other ways*'.

According to this line of thought, a stakeholder dialogue can build on the dialogue meetings about the commune development plans. These meetings involve the communes and the relevant province departments. For practical reasons, they are normally held district by district. This would be a two-way process and, hopefully, to the benefit of both the commune and the province level of planning:

- The communes have good links to the villages and to individual stakeholders, to an extent that cannot practically be achieved by the province administration
- The province departments of the different ministries are informed about national policies and programmes, and have sector expertise (in-house, or via access to the ministries) covering for example alternative livelihoods, supportive regulation and new technology

In short, the communes have a particular understanding of the development needs while the province departments have a particular understanding of opportunities and context.

The commune development planning is facilitated by the Province Department of Planning and the Province Department of Local Administration (under MoI). It is linked with the provincial strategic development planning process, and in turn with the national development planning.

Advantages of this approach include (i) a realistic level of effort, involving a moderate workload and without any need of new administrative procedures or bodies; (ii) the public participation being mainstreamed directly into the decision process; and (iii) a provision for routing concerns and ideas into the right pipeline (in terms of sector and planning level): Ideas suited for commune level implementation feed into the commune planning, ideas suited for province level implementation feed into the province planning, and so forth.

Another attractive platform for dialogue is the water user groups /farmers water user communities ¹². This dialogue is mainly maintained within MOWRAM and is hereby more narrowly focused on water allocation and water uses.

A gap that needs to be filled is the dialogue with the private sector, including businesses, processing and manufacturing, and investment. The private sector provides a supplementary (and often strongly development-oriented) perspective, as well as a source of funding that is complementary to the government budget and donor funds.

Under the present PDA, recommendations will be made and discussed about practical and useful modalities, and a short stakeholder participation plan will be drafted for pilot implementation. The work will be done in an active dialogue with the '*Functional Partnerships*' established during Phase 1 ¹³.

Activity 3.1: Data review, opportunities and threats

Review existing water resource, socio-economic and environmental data and information for the sub-basins, determine gaps in information for IWRM requirements and assess the emerging water, social and environmental problems and the opportunities and threats relating to possible water development

¹² In Cambodia, a water user group (WUG) can be an informal entity, while a farmers water user community (FWUC) is a formal entity, with bylaws approved by MOWRAM. A WUG can be the predecessor of a FWUC; in some cases, an FWUC is divided into several WUGs

¹³ CamboWP and CNMC (June 07)

A comprehensive data collection has been reported by CNMC (November 05) and in the Planning Atlas prepared by MRC in connection with its Basin Development Plan (2006).

Social and socio-economic data at commune and village level are readily available in the national Commune Database (the latest version covering 2005).

An update of the information is mainly required about development opportunities and threats, which can shift rapidly along with new related developments and new knowledge. Reviews will be made at both workshops planned under the PDA, possibly involving a scoping questionnaire.

Further information will be produced under the pilot community awareness programme (Activity 2.1).

An open-minded screening of development opportunities is an important supplement to the more focused task of solving concrete problems, because problems and opportunities can be complementary. In the end, most development initiatives may relate to some general, over-all problem, such as income generation, livelihood generation or public health. At the operational level, however, problems and opportunities may appear as separate perspectives. For example, tourism may offer an attractive development opportunity even if no '*problems*' have been encountered. Similarly, a new production technology may have been implemented successfully elsewhere in the country while it remains unknown or inaccessible in the study area. A screening can reduce the risk that some opportunity has been overlooked.

A screening of water-related development opportunities was made during Phase 1. This screening will be re-visited during the PDA.

Box 4.2: Examples of water-related development opportunities (in random order)	
Supplies	Infrastructure
Water supply for households / livestock	Road connections, bridges
Water supply for wet season / dry season cultivation	River ports, navigation
Electricity	Production systems
Services	New technology (for cultivation / aquaculture / agroprocessing)
Credit	Agriculture: Crops, livestock
Marketing support	Capture fisheries, aquaculture
Management and mitigation of drought and floods	Hydropower
Management of river erosion and sedimentation	Agro-processing
Management of surface water quality	Water-related tourism
Groundwater utilization, management of groundwater quality	Others
Sewage disposal, solid waste disposal	Land ownership, land management
Wetlands management	Social security

Results will be distributed as electronic files on a CD ROM.

Activity 3.2: Inventory of structures and water uses

Prepare an inventory of existing water control structures and their current effectiveness, and of water use practices, in the sub-basins/catchments

The inventory will be produced using a data collection sheet and check list as exemplified in Appendix 8 (but in Khmer language). Results will be entered into an ordinary spreadsheet, ready for analysis and transfer to GIS applications.

It is expected that a major part of the information is available beforehand at the province departments. This information is valuable in its own right and allows for making suitable priorities for the field work.

All information will be shared with the related province departments, which may, in turn, provide quality checks of the data and information.

Results will be distributed as electronic files on a CD ROM.

Box 4.3: Rehabilitation of irrigation infrastructure

One key question is: *'Has this scheme ever functioned well'?*

- If 'yes', until when, and what happened to cause that it does not function well any longer? Typical answers could be lack of maintenance, or a healthy concept with a wrong design, such as inadequate flow capacity of structures, so that they became affected by siltation and/or erosion, or a healthy scheme with a suitable design but poor construction quality, so that structures have been damaged in the course of time.
- If 'no', the reason why should be investigated. There are many examples that schemes that have never functioned well should never have been built in the first place. On the other hand, there may be some obvious explanation (like faulty design of an otherwise healthy scheme) that can be remedied

That a scheme has worked well in the past is an indication of its feasibility, but not a proof. The reason(s) that it does not work well any longer can be prohibitive - like a permanent upstream diversion, or an irreversible change of the planform of the river network. A truly feasible scheme would normally be preserved at the initiative of the water users, at their own cost, if they agree to its usefulness.

Schemes that have never worked well must be considered with due diligence with respect to hydraulic feasibility.

Source: NWISP-2 (Dec 06)

Activity 4.1: IWRM roadmap

Discuss and debate with the agreed institutional arrangements the resource issues, problems and opportunities and determine priority studies and investigations to further move toward developing an IWRM plan, or 'roadmap' for the sub-catchments

It is hoped that towards the end of this PDA, a solid impression has been achieved of the benefits of IWRM. To keep the momentum, a small 'roadmap' will be prepared for the 4-P area.

The work will build on previous IWRM-based studies in the same area (CNMC Jan 05 and CamboWP and CNMC June 06), as well as on the proceedings of the present PDA, expectedly including site-specific institutional networking, dialogue with the private sector, and public participation modalities.

IWRM-based planning exercises have been made on a pilot basis in Kg Cham province (MOWRAM, Nov 05) and Kampot province (MOE, Nov 07).

Comprehensive guidance is available from previous work, such as:

- The original national water sector roadmap (MOWRAM April 03), prepared with support from prof. Paul Mosley, funded by ADB. This (not widely circulated) document has been carried forward to
- MOWRAM (Feb 06): Strategic development plan 2006-2010; and
- MOWRAM (2006): IWRM strategy and roadmap in Cambodia.

Other useful references are

- MRC-BDP (Dec 05): Strategic directions for IWRM in the Lower Mekong Basin. Prepared in connection with Mekong River Commission's Basin Development Plan; and
- CamboWP and CNMC (Sep 07): IWRM in Cambodia - where are we, and where do we want to go? Discussion paper

Further guidance is available from ADB's '*25 IWRM elements*', attached as Appendix 6, and '*Proposed guiding principles*', attached as Appendix 7.

It is expected that the roadmap will be developed in a dialogue with the province departments and stakeholders at two meetings and a workshop.

Activity 4.2: Institutional arrangements

Recommend at the end of the project appropriate on-going institutional arrangements that can be implemented to provide a continuing focus of good IWRM in the sub-catchments

A supportive institutional framework is a precondition for consolidation and expansion of IWRM. Recommendations to this regard will depend on the lessons to be learnt during the PDA.

A distinction can be made between '*the high road*' and '*the low road*', with complementary benefits and risks, as follows:

- '*The high road*': Aiming directly at a formal River Basin Authority, like the recently established one for the Tonle Sap Basin. This can be a powerful platform, particularly if entrusted with water supplies and service delivery, but implementation can be time-consuming, and operation can be impeded by barriers between the involved institutions
- '*The low road*': Strengthening the existing sector coordination mechanisms at province level, and providing a (new) link between the two provinces that share the 4-P area. This would not require any formal approval above province level, nor any re-allocation of duties and responsibilities among the involved line agencies. The benefits could match those of a formal authority, but would depend on adequate institutional support

The former may be taken as a long-term aim and the latter as a short-term aim. Many of the potential benefits are related to knowledge-sharing, as much as to the availability of an authority with a formal mandate. If so desired, a stepwise development can be selected, where the initial operation aims at informal guidance and networking, to be consolidated later on with formal responsibilities and authority. In the course of time, the mandate can be strengthened to any desired level, as exemplified in other countries. It could be counter-productive (and unnecessary) to proceed too fast.

It is worth noting that in 2003-05, CNMC operated a well functioning '*sub-area study group*' covering largely the same area. The study group brought together representatives from relevant agencies, who jointly carried out baseline and scenario analyses and agreed on

recommendations on priority development initiatives (CNMC Nov 05). The working group had no formal mandate whatsoever, and could not undertake implementation of its recommendations, but suitable implementing agencies would (in most cases) be readily available among the agencies represented in the working group.

Box 4.4: Institutional requirements

The benefits of IWRM can be supported by for example

- networking between institutional actors in the basin,
- formulation of priorities, and regular updating of these priorities, in response to new challenges, new opportunities, and new knowledge. The priorities might be described in an updated roadmap,
- promotion of related development activities, and institutional support to such activities,
- a focal point for donor- and NGO-supported development activities in the basin, as well as related liaison with the private sector, supporting exchange of knowledge and lessons learnt, and initiating coordination and interfacing where needed, and
- a focal point for exchange of knowledge and lessons learnt at the national level and with other river basins and provinces.

It is likely that such services could add significantly to the desired development at a small extra cost. For example, there could be clear advantages (and small costs) of bringing two parties together that are involved in related work but without knowing it.

In case that a formal River Basin Authority is aimed at, its geographical jurisdiction should be somewhat extended as compared with the present study area (in order to prevent that certain areas fall into gaps between river basins).

The PDA will make suggestions on suitable institutional arrangements in a dialogue with the involved province departments and other stakeholders.

4.4 Performance indicators

The following measurable performance indicators are specified in the Letter of Agreement:

- A set of agreed basin institutional arrangement with clear operating guidelines implemented
- Awareness raising and participation processes in place and operational
- An action plan with investment priorities agreed

4.5 Workshops and meetings

The following workshop and meeting schedule is indicative.

Table 4.2: Workshop and meeting schedule

No.	Place	Participation	Agenda
M1	Kratie	Province departments	1.1 River basin management options (D)
		Functional Water Partnerships	1.2 Project management (D)
		Others ?	2.1 Pilot awareness programme (D)
			2.2 Public participation model (D)
			3.2 Inventory of structures and water uses (D)
WS1	Kratie	Province departments	1.1 River basin management options (D)
		Functional Water Partnerships	1.2 Project management (D)
		Other water user representatives	2.1 Pilot awareness programme (D)
		Others ?	2.2 Public participation model (D)
			3.1 Data review, opportunities and threats (D)
M2	Kratie	Province departments	1.1 River basin management options (R)
		Functional Water Partnerships	1.2 Project management (R)
		Others ?	2.1 Pilot awareness programme (R)
			2.2 Public participation model (R)
			3.2 Inventory of structures and water uses (D)
			4.1 IWRM roadmap (D)
			4.2 Institutional arrangements (D)
WS2	Phnom Penh	Province departments	1.1 River basin management options (D)
		Selected line agencies	2.1 Pilot awareness programme (D)
		Functional Water Partnerships	2.2 Public participation model (D)
		Others ?	3.1 Data review, opportunities and threats (D)
			3.2 Inventory of structures and water uses (D)
			4.1 IWRM roadmap (D)
			4.2 Institutional arrangements (D)
M3	Kratie	Province departments	3.1 Data review, opportunities and threats (D)
		Functional Water Partnerships	3.2 Inventory of structures and water uses (D)
		Others ?	4.1 IWRM roadmap (R)
			4.2 Institutional arrangements (R)

WS = workshop, M = meeting, D = for discussion, R = aiming at a recommendation

Advisory/liaison panel members and ADB representatives are welcome to all meetings and workshops

4.6 Reporting

The technical reporting will comprise

- (i) The present Project Inception Report: This includes, among others, detailed work and financing plan, project management and monitoring system, reporting, terms of references and other relevant information;
- (ii) Project Mid-term Report: Interim findings and suggestions; obstacles to progress (if any);
- (iii) Project Completion Report: Findings, recommendations, and lessons learnt.

All reports will be available as electronic files on a CD ROM, together with workshop documents, maps, photos and data tables.

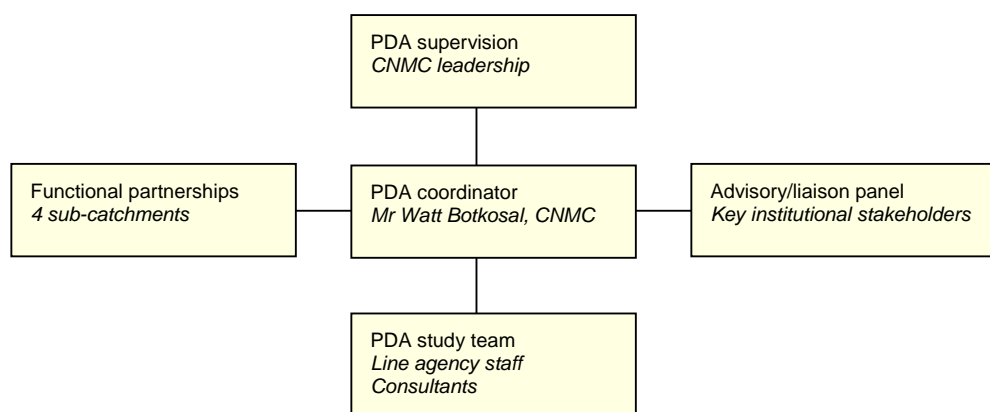
5 ORGANIZATION

5.1 General

The PDA will be executed CamboWP under the CNMC. Implementation will take place in collaboration with relevant line agencies.

The project is based on using line agency staff and local consultants/experts where necessary.

Figure 5.1: PDA organization



PDA supervision:	Monitoring of progress and quality
PDA coordinator:	Over-all coordination, including workshops, data collection and reporting Coordination of study team, resource allocation, and implementation of activities External liaison: ADB, functional partnerships, advisory/liaison panel Financial management
PDA secretary:	Secretarial support to coordinator Workshop logistics and reporting Accounting
Functional partnerships:	Established during phase 1 (one for each of the 4 sub-catchments) Focal points for local liaison and participation
Advisory/liaison panel:	Institutional liaison and participation Guidance during implementation
Study team:	Line agency liaison/representation Professional contributions, covering a variety of disciplines Data collection, data analysis and reporting Drafting of analyses and recommendations

Please refer to Appendix 3 (terms of reference).

5.2 The study team

The study team is composed of

- Line agency representatives; and
- National consultants.

The multi-disciplinary character of the PDA requires mobilisation of a broad range of expertise:

- IWRM, river basin planning
- Institutional aspects
- Socio-economy, community development, public participation
- Irrigation technology, including structures (for inventory of control structures)
- Data and GIS analysis
- Miscellaneous: Agriculture/agro-economy; environment; tourism

A manageable size of the team has been aimed at. The following members have been mobilised, who, between them, cover most of the required expertise:

- Water resources specialist
- Sociologist
- Irrigation specialist
- GIS specialist

A provision has been made in the budget to involve additional supplementary expertise on an ad hoc basis, in case the need arises.

The task allocation within the team will be as shown in the table below.

Table 5.1: Task allocation

Position / activity	1.1	1.2	2.1	2.2	3.1	3.2	4.1	4.2
Coordinator	L	L	S	S	S	S	S	S
Water resources specialist					L	S	L	L
Sociologist			L	L	S		S	
Irrigation specialist					S	L	S	
GIS specialist					S	S		

L = lead role, S = support role

Activities:

- 1.1 River basin management
- 1.2 Project management
- 2.1 Awareness programme
- 2.2 Public participation
- 3.1 Opportunities and threats
- 3.2 Inventory
- 4.1 IWRM roadmap
- 4.2 Institutional arrangements

For details, please refer to Appendix 3 (terms of reference).

5.3 Institutional networking

To achieve integrated planning, a dialogue must take place between

- planning levels;
- sectors; and
- the provinces in the river basin.

Among these, links are well established between the planning levels, while the other links are more formal and distant. Particular IWRM-related benefits can emerge from inter-sector dialogue at the national and province levels (while the commune planning takes place across sectors).

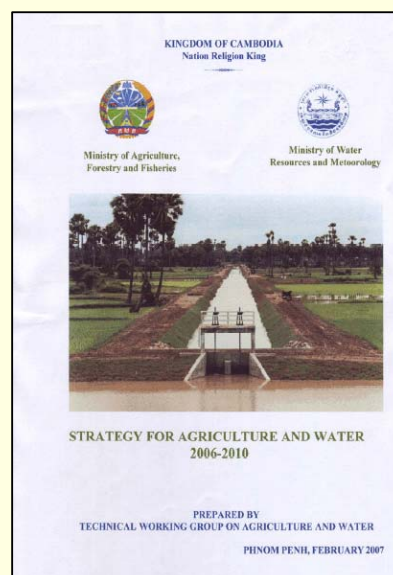
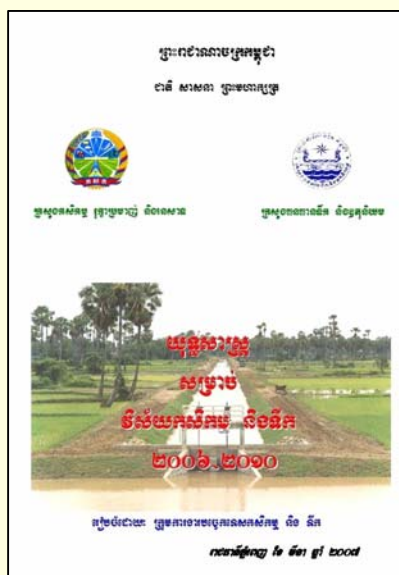
Institutional networking is a major challenge, due to the number of bodies involved in water-related development at the national and the province level. On the other hand, there is a clear potential benefit which can be achieved at a small cost.

Institutional networking will be initiated under the PDA (Activity 1.2), and the PDA will make recommendations on consolidation and expansion (Activity 4.2).

At the level of the present PDA, institutional networking will be supported mainly at the province level (which is closest to the river basin development agenda).

Box 5.1: Joint strategy for agriculture and water

The joint strategy for agriculture and water 2006-2010 (MAFF and MOWRAM Feb 07) illustrates the value of interdisciplinary collaboration. The joint approach can provide benefits over and above the benefits of separate development efforts.

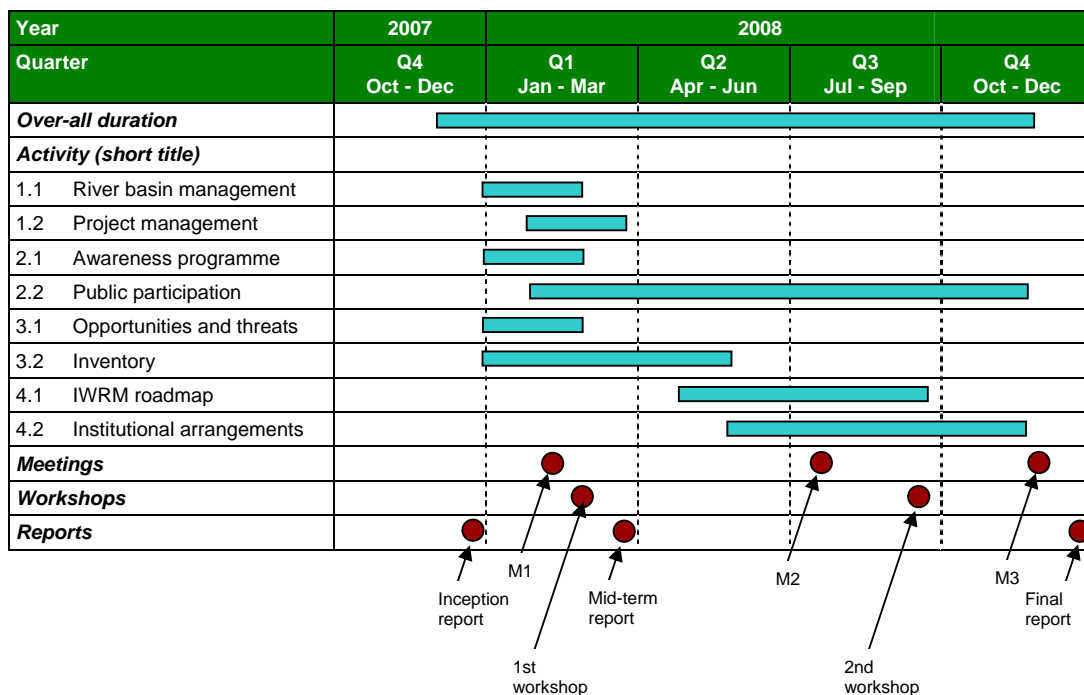


6 TIME SCHEDULE

The over-all duration is 12 months, from 20 November 2007 to 20 November 2008.

The proposed time schedule is shown below. As compared with the LoA, the mid-term report has been shifted by 2 months, in order to provide some time after inception reporting to achieve some meaningful mid-term results.

Figure 6.1: Time schedule



Milestones

Start of PDA	20 November 07
Inception report	20 December 07
1 st Meeting (M1)	07 February 08
1 st workshop	15-16 February 08
Mid-term report	20 March 08
2 nd Meeting (M2)	28-29 July 08
2 nd workshop	15-16 September 08
3 rd Meeting (M3)	03-04 November 08
PDA completion	20 November 08
Final report	20 December 08

7 BUDGET

The costs have been summarized as follows in the Letter of Agreement:

1. Civil Works:	0 USD
2. Equipment and supplies: One GPS	400 USD
3. Training, workshops, seminars, public campaigns: Workshops, meetings, seminars, in-country travel, preparation of briefing and public awareness materials, etc.	26,500 USD
4. Specialist services: National experts	18,000 USD
5. Project management: Secretary for 12 months	3,000 USD
6. Contingencies	2,100 USD
Total PDA grant financed	50,000 USD

National contributions in kind comprise participation by management professional staff from CNMC, line agencies and province departments; and office space and facilities, including computer hardware and software.

Please refer to Appendix 4 for a detailed breakdown.

8 RISKS

Some assumptions have been listed in Appendix 2.

No serious risks to progress and orderly completion have been identified at this stage.

REFERENCES

All documents are available electronically

- ADB (Nov 07): Asian Water Development Outlook
- ADB (Jan 05): Country strategy and program 2005-09, Kingdom of Cambodia
- CamboWP and CNMC (Sep 07): IWRM in Cambodia - where are we, and where do we want to go?
Discussion paper
- CamboWP and CNMC (Jun 07): The 4-P Area: The Prek Preah, Prek Krieng, Prek Kampi and Prek Te river basins. An IWRM-based pilot study of water-related development opportunities, Phase 1: A Functional Water Partnership for the 4-Ps. Cambodia Water Partnership and Cambodia National Mekong Committee
- CNMC (Jan 05): Sub-Area Analysis and Development, the Northern Cambodia-Southern Laos and Kratie Sub-Areas (SA 6C & 8C). Prepared by Cambodia National Mekong Committee as a contribution to MRC's Basin Development Plan
- CNMC (Aug 03): Integrated water resources management in Cambodia. National Sector Review prepared for MRC's Basin Development Plan by Cambodia National Mekong Committee
- MAFF (Jun 06): National Programme for Household Food Security and Poverty Reduction 2007-2011
- MAFF and MOWRAM (Feb 07): Joint strategy for agriculture and water 2006-2010, prepared by Ministry of Agriculture, Forestry and Fisheries and Ministry of Water Resources and Meteorology
- MOE (Apr 05): State of the Environment Report 2004, prepared by Ministry of Environment
- MOP (Nov 03): Cambodia Millennium Development Goals report 2003
- MOWRAM (06): IWRM strategy and roadmap in Cambodia
- MOWRAM (Feb 06): Strategic Development Plan 2006-2010 (draft), prepared by Ministry of Water Resources and Meteorology
- MRC-BDP (Dec 05): Strategic directions for IWRM in the Lower Mekong Basin. Prepared in connection with Mekong River Commission's Basin Development Plan
- NPRS (Nov 02): National Poverty Reduction Strategy 2003-2005, prepared by Council for Social Development
- NSDP (Nov 05): National Strategic Development Plan 2006-2010 (draft English translation)
- NWISP-2 (Dec 06): Guideline: Hydraulic assessment of irrigation schemes. Prepared for MOWRAM by PRD Water & Environment in association with DHI Water & Environment under North West Irrigation Sector Project, river basin and water use studies, Package 2, Dauntri and Boribo Sub-basins

APPENDIX 1: PDA SPECIFICATIONS

Appendix 1 of Letter of Agreement between ADB and CamboWP/CNMC 19-20 Nov 07

Cooperation Fund for the Water Sector PILOT AND DEMONSTRATION ACTIVITY (PDA)

Activity title:	Piloting river basin approach to IWRM in Eastern Cambodia
Executing agency:	Global Water Partnership-Cambodia under the Cambodia National Mekong Committee
PDA start date:	20 November 2007 ¹⁴
Activity end date:	20 November 2008
Contact details:	Watt Botkosal, Officer-In-Charge, Global Water Partnership – Cambodia under the Cambodia National Mekong Committee

1. Objectives:

The Pilot and Demonstration Activity (PDA) will support the Cambodia National Mekong Committee in introducing the river basin approach to implementing integrated water resources management (IWRM) in Cambodia.

The principal objectives of the PDA are:

- i) Develop, in conjunction with provincial and district administrations, appropriate river basin management institutional arrangements,
- ii) Undertake resource assessments and scenario analyses relating to medium to long term IWRM planning for the Prek Preah, Prek Krieng, Prek Kampi and Prek Te sub –basins and discuss and debate these with the basin institutional arrangements,
- iii) Raise awareness amongst the provincial and district administrations, and community/farmer/NGO stakeholders of the implications and benefits of good water governance and good IWRM practices and the benefits of inter-agency collaboration,
- iv) Guidance for future investments and development efforts relating to water management and service delivery.

2. Scope and location of work / description of activities:

The principal activities will be to:

- i) Develop options for coordinated river basin management across the two provinces, and various districts in the sub-basins, and debate these with line agencies and province/district administrations to determine an agreed institutional option to manage the project,
- ii) Determine and implement (on a pilot and demonstration basis) a community awareness program for IWRM issues and through this, establish and implement a model for public participation in the project at all levels of stakeholders,
- iii) Review existing water resource, socio-economic and environmental data and information for the sub-basins, determine gaps in information for IWRM requirements and assess the

¹⁴ Start and end dates changed to reflect the signing of the LoA

emerging water, social and environmental problems and the opportunities and threats relating to possible water development,

- iv) Prepare an inventory of existing water control structures and their current effectiveness, and of water use practices, in the sub-basins/catchments,
- v) Discuss and debate with the agreed institutional arrangements the resource issues, problems and opportunities and determine priority studies and investigations to further move toward developing an IWRM plan, or 'roadmap' for the sub-catchments,
- vi) Recommend at the end of the project appropriate on-going institutional arrangements that can be implemented to provide a continuing focus of good IWRM in the sub-catchments.

The project is based on using line agency staff and local consultants/experts where necessary to identify institutional options, and the water related resource assessment issues, and water development and protection opportunities and threats.

3. Implementation schedule and institutional management arrangements:

The project will be implemented over a period of 12 months by the Cambodia National Mekong Committee through the Global Water Partnership-Cambodia in collaboration with other line agencies involved in accelerating introduction of integrated water resources management (IWRM) principles as espoused by the Global Water Partnership.

The project is based on using line agency staff and local consultants/experts where necessary to identify institutional options, undertake water related resource assessment and analysis of water development and protection opportunities and threats.

4. Expected results (outputs/outcomes):

- A set of river basin institutional arrangements agreed upon by stakeholders early on and piloted in the river basin, including operating guidelines
- Awareness raised as to the key IWRM issues facing these stakeholders and public participation modalities demonstrated
- A preliminary assessment of relevant issues, opportunities, constraints and scenarios for development possibilities
- An agreed set of resource protection issues and action plan, including investment opportunities

5. Measurable performance indicators:

- A set of agreed basin institutional arrangement with clear operating guidelines implemented
- Awareness raising and participation processes in place and operational
- An action plan with investment priorities agreed

6. Stakeholders participation:

Once the provincial/district institutional options are discussed and agreed, the initial task will be to develop a clear project plan and an early priority will be to develop a community/ stakeholder participation plan, take this to various representative levels of stakeholders and obtain endorsement of the approach. Participation activities will be reported regularly to the peak level institutional arrangements.

APPENDIX 2: LOGFRAME

Development objective	Indicator(s)	Means of verification	Assumptions, risks	
<i>Visible progress towards achieving the national vision for water:</i>				
<ul style="list-style-type: none"> Access for all to safe, adequate, and affordable drinking water, hygiene, and sanitation Freedom for all from the threat of loss of life and livelihood as a result of floods and droughts Sufficient water where it is needed, to provide for food security and industrial activity A water environment that is unpolluted, and supports healthy fisheries and aquatic ecosystems 	<ul style="list-style-type: none"> Improved access to safe water Water-related risks (floods and drought) well managed Continued development of water-related sectors in terms of revenue and livelihoods Aquatic ecosystems reflecting agreed standards 	<ul style="list-style-type: none"> National statistics Macroeconomic monitoring Environmental monitoring (water quality and aquatic habitats) 	<ul style="list-style-type: none"> Political support Manageable climate variability 	
Immediate objectives				
1	Develop, in conjunction with provincial and district administrations, appropriate river basin management institutional arrangements	Agreed (recommendations on) institutional arrangements with clear operating guidelines implemented	PDA report	<ul style="list-style-type: none"> Adequate support from involved administrations Delay in formal implementation, depending on the preferred management modality
2	Raise awareness amongst the provincial and district administrations, and community/farmer/NGO stakeholders of the implications and benefits of good water governance and good IWRM practices and the benefits of inter-agency collaboration	Awareness raising and participation processes in place and operational	Feedback from stakeholders reflected in workshop proceedings and PDA report	Adequate support from involved administrations
3	Undertake resource assessments and scenario analyses relating to medium to long term IWRM planning for the Prek Preah, Prek Krieng, Prek Kampi and Prek Te sub-basins and discuss and debate these with the basin institutional arrangements	Agreed action plan with investment priorities	PDA report	<ul style="list-style-type: none"> Adequate data quality (mainly in terms of coverage and validity) Agreement among stakeholders about opportunities and priorities
4	Guidance for future investments and development efforts relating to water management and service delivery	(same as above)	(same as above)	(same as above)

APPENDIX 3: TERMS OF REFERENCE

PDA coordinator

Position:	PDA coordinator
Reporting to:	PDA supervisor
Tasks:	<p>Over-all coordination, including workshops, data collection and reporting Coordination of study team, resource allocation, and implementation of activities External liaison with ADB, functional partnerships, and the advisory/liaison panel Financial management, supervision of accounting</p> <p>Lead role in implementation and reporting of tasks</p> <p>1.1 (river basin management) 1.2 (project management)</p> <p>Provision of guidance and active support to tasks</p> <p>2.1 (awareness programme) 2.2 (public participation) 3.1 (opportunities and threats) 3.2 (inventory) 4.1 (IWRM roadmap) 4.2 (institutional arrangements)</p>

PDA study team

Position:	Water resources specialist
Reporting to:	PDA coordinator
Tasks:	<p>Participation in workshops, data collection and reporting</p> <p>Lead role in implementation and reporting of tasks</p> <p>3.1 (opportunities and threats) 4.1 (IWRM roadmap) 4.2 (institutional arrangements)</p> <p>Provision of guidance and active support to task</p> <p>3.2 (inventory)</p>
Position:	Sociologist
Reporting to:	PDA coordinator
Tasks:	<p>Participation in workshops, data collection and reporting</p> <p>Lead role in implementation and reporting of tasks</p> <p>2.1 (awareness programme) 2.2 (public participation)</p> <p>Provision of guidance and active support to tasks</p> <p>3.1 (opportunities and threats) 4.1 (IWRM roadmap)</p>

Position: Irrigation specialist**Reporting to:** PDA coordinator

Tasks: Participation in workshops, data collection and reporting

Lead role in implementation and reporting of task
3.2 (inventory)

Provision of guidance and active support to tasks
3.1 (opportunities and threats)
4.1 (IWRM roadmap)

Position: GIS specialist**Reporting to:** PDA coordinator; collaborating closely with the water resources specialist, the irrigation specialist, and the sociologist

Tasks: Data and GIS analyses, mainly under tasks
3.1 (opportunities and threats)
3.2 (inventory)

Preparation, under guidance by the coordinator, of a revised map of the 4-P area, considering hydrological boundaries as well as administrative boundaries

Preparation, under guidance by the water resources specialist, of a revised map of the 4-P river network, showing hydrological (basin and sub-catchment) boundaries as well as the nominal river basin boundary

Preparation of a data table of communes, total area, area within river basin, villages located within river basin

Preparation, under guidance by the sociologist, of data tables (with maps) extracted from the commune database, showing population and other characteristics

Functional partnerships**Position: Partnership chief / vice chief****Reporting to:** PDA coordinator

Tasks: Participation in workshops and meetings as relevant from case to case

Guidance on IWRM-related development needs and opportunities

Guidance on awareness-building and stakeholder participation

Review and guidance on suggestions and draft recommendations

Position: Partnership member**Reporting to:** Partnership chief / vice chief

Tasks: Participation in workshops and meetings as relevant from case to case

Guidance on IWRM-related development needs and opportunities

Guidance on awareness-building and stakeholder participation

Review and guidance on suggestions and draft recommendations

Advisory/liaison panel**Position:** Panel member**Reporting to:** PDA coordinator

Tasks:

- Participation in workshops and meetings as relevant from case to case
- Guidance on IWRM-related development needs and opportunities
- Guidance during preparation of roadmap (Activity 4.1)
- Guidance during preparation of recommendations on institutional arrangements (Activity 4.2)
- Support to dissemination of mid-term and final reports

The panel members are welcome to contribute any opinions and advice in the course of the PDA

APPENDIX 4: BUDGET BREAKDOWN

Description			2007	2008				Sub-Total
			Q4	Q1	Q2	Q3	Q4	
A	Equipment and Supplies							
	A1	GPS		400				
	Sub-Total			400				400
B	Training, Workshops, seminars, public campaigns							
	B.1	Workshops		4,000		4,000		
	B.2	Meetings		3,500		3,500	3,500	
	B.3	Field trips		2,000	3,000	1,000	2,000	
	Sub-Total			9,500	3,000	8,500	5,500	26,500
C	Specialists Services							
	C.1	Water resources specialist		1,500	1,500			
	C.2	Sociologist		3,000				
	C.3	Irrigation specialist		3,000				
	C.4	GIS specialist		3,000				
	C.5	To be allocation for other specialist		1,500	4,500			
	Sub-Total			12,000	6,000			18,000
D	Project Management							
	D.1	Secretary	250	750	750	750	500	
	Sub-Total		250	750	750	750	500	3,000
	Contingency		700		700		700	2,100
	Total budget		950	22,650	10,450	9,250	6,700	50,000

APPENDIX 5: ELECTRONIC LIBRARY

The following documents have been compiled and are available electronically:

- ADB (Nov 07): Asian Water Development Outlook
- ADB (Nov 06a): ADB Water Financing Program 2006-2010 - Helping to introduce IWRM in 25 river basins in the Asia-Pacific Region
- ADB (Nov 06b): ADB Review Vol 38 No 4, about ADB's new Water Financing Programme
- ADB (Jan 05): Country strategy and program 2005-09, Kingdom of Cambodia
- CamboWP and CNMC (Sep 07): IWRM in Cambodia - where are we, and where do we want to go? Discussion paper
- CamboWP and CNMC (Jun 07): The 4-P Area: The Prek Preah, Prek Krieng, Prek Kampi and Prek Te river basins. An IWRM-based pilot study of water-related development opportunities, Phase 1: A Functional Water Partnership for the 4-Ps. Cambodia Water Partnership and Cambodia National Mekong Committee
- CLSA (Sep 05): Chinese tourists - coming, ready or not!
- CNMC (Aug 03): Integrated water resources management in Cambodia. National Sector Review prepared for MRC's Basin Development Plan by Cambodia National Mekong Committee
- CNMC (Jan 05): Sub-area analysis and development, the Northern Cambodia-Southern Laos and Kratie sub-areas (SA 6C
- 8C). Prepared by Cambodia National Mekong Committee as a contribution to MRC's Basin Development Plan
- MAFF (Jun 06): National Programme for Household Food Security and Poverty Reduction 2007-2011
- MAFF and CNMC (Jun 03a): Fisheries management. National sector review prepared for MRC's Basin Development Plan by Ministry of Agriculture, Forestry and Fisheries in association with Cambodia National Mekong Committee
- MAFF and CNMC (Jun 03b): Watershed management. National sector review prepared for MRC's Basin Development Plan by Ministry of Agriculture, Forestry and Fisheries in association with Cambodia National Mekong Committee
- MAFF and MOWRAM (Feb 07): Joint strategy for agriculture and water 2006-2010, prepared by Ministry of Agriculture, Forestry and Fisheries and Ministry of Water Resources and Meteorology
- MEF and MOE (03): Cambodia national report on protected areas and development. Prepared by International Centre for Environmental Management, Queensland, for Ministry of Economics and Finance and Ministry of Environment
- MIME and CNMC (Jun 03): Hydropower. National sector review prepared for MRC's Basin Development Plan by Ministry of Industry, Mines and Energy in association with Cambodia National Mekong Committee
- MOE (Apr 05): State of the Environment Report 2004, prepared by Ministry of Environment
- MOP (Nov 03): Cambodia Millennium Development Goals report 2003
- MOT and CNMC (Jun 03): Tourism development. National sector review prepared for MRC's Basin Development Plan by Ministry of Tourism in association with Cambodia National Mekong Committee
- MOWRAM (06): IWRM strategy and roadmap in Cambodia
- MOWRAM (Feb 06): Strategic Development Plan 2006-2010 (draft), prepared by Ministry of Water Resources and Meteorology
- MOWRAM (Nov 05): Water resources management plan for Kampong Cham province. Draft English outline prepared under the national capacity Development Project by Department of Water Resources and Meteorology, Kg Cham province

- MOWRAM and CNMC (Jun 03a): Flood mitigation and management. National sector review prepared for MRC's Basin Development Plan by Ministry of Water Resources and Meteorology in association with Cambodia National Mekong Committee
- MOWRAM and CNMC (Jun 03b): Irrigated agriculture. National sector review prepared for MRC's Basin Development Plan by Ministry of Water Resources and Meteorology in association with Cambodia National Mekong Committee
- MOWRAM and CNMC (Jun 03c): Water supply: Domestic water and sanitation, and industrial water use. National sector review prepared for MRC's Basin Development Plan by Ministry of Water Resources and Meteorology in association with Cambodia National Mekong Committee
- MPWT and CNMC (Jun 03): Navigation, transport and river works. National sector review prepared for MRC's Basin Development Plan by Ministry of Public Works and Transport in association with Cambodia National Mekong Committee
- MRC (Sep 06): The MRC Basin Development Plan, Completion Report for Phase 1. Mekong River Commission
- MRC-BDP (Dec 05): Strategic directions for IWRM in the Lower Mekong Basin. Prepared in connection with Mekong River Commission's Basin Development Plan
- Neou Bonheur (Nov 02): National report on the prevention and resolution of environmental conflicts in the Mekong River Basin - Cambodia. Prepared for CNMC and MRC
- NPRS (Nov 02): National Poverty Reduction Strategy 2003-2005, prepared by Council for Social Development
- NSDP (Nov 05): National Strategic Development Plan 2006-2010 (draft English translation)
- NWISP-2 (Dec 06): Guideline: Hydraulic assessment of irrigation schemes. Prepared for MOWRAM by PRD Water Environment in association with DHI Water
- Environment under North West Irrigation Sector Project, river basin and water use studies, Package 2, Dauntri and Boribo Sub-basins
- UN-WWAP (Mar 06): The inclusion of IWRM in national plans. Report from the 4th World Water Forum Theme 'Implementing IWRM', prepared by UN-Water's World Water Assessment Programme
- WB and ADB (Jun 06): Mekong Water Resources Assistance Strategy (MWRAS). Joint working paper on future directions for water resources management in the Mekong River Basin, prepared by The World Bank and ADB
- WB (Apr 03): Cambodia Environment Monitor 2003. The World Bank

APPENDIX 6: 25 IWRM ELEMENTS

Entire appendix is quoted from ADB (Nov 06a)

What is IWRM? Integrated water resources management (IWRM) is now recognized across the world as the process to promote the coordinated development and management of water, land and related resources in river basins, to maximize the economic benefits and social welfare in an equitable manner without compromising the sustainability of vital ecosystems.

The following 25 elements are widely accepted to be important in introducing integrated water resources management (IWRM) in river basins. Incorporating these elements into institutional reforms, development strategies, and investment projects will make a significant difference for IWRM in the basin. Improvements may also be needed in the enabling environment at the national level.

IWRM element	Typical interventions/criteria
1. River basin organization	Build capacity in new or existing RBO, focusing on the four dimensions of performance (stakeholders, internal business processes, learning and growth, and finance) under the Network of Asian River Basin Organization's (NARBO) benchmarking service
2. Stakeholder participation	Institutionalize stakeholder participation in the river basin planning and management process including active participation of local governments, civil society organizations (academe, NGOs, parliamentarians, media), and the private sector, and an enabling framework for meaningful stakeholder participation in project specific planning decisions
3. River basin planning	Prepare or update a comprehensive river basin plan or strategy, with participation and ownership of basin stakeholders, and application of IWRM principles in land use planning processes
4. Public awareness	Introduce or expand public awareness programs for IWRM in collaboration with civil society organizations and the media
5. Water allocation	Reduce water allocation conflicts among uses and geographical areas in the basin with participatory and negotiated approaches, incorporating indigenous knowledge and practices
6. Water rights	Introduce effective water rights or entitlements administration that respects traditional or customary water use rights of local communities and farmers and farmer organizations
7. Wastewater permits	Introduce or improve wastewater discharge permits and effluent charges to implement the polluter pays principle
8. IWRM financing	Institutionalize models whereby all levels of government contribute budget to IWRM in the basin
9. Economic instruments	Introduce raw water pricing and/or other economic instruments to share in IWRM costs, stimulate water demand management and conservation, protect the environment and pay for environmental services
10. Regulations	Support the development and implementation of a legal and regulatory framework to implement the principles of IWRM and its financing in the basin, including tariffs, charges, quality standards and delivery mechanisms for water services
11. Infrastructure for multiple benefits	Develop and/or manage water resources infrastructure to provide multiple benefits (such as hydropower, water supply, irrigation, flood management, salinity intrusion, and ecosystems maintenance)
12. Private sector contribution	Introduce or increase private sector participation in IWRM through corporate social responsibility (CSR)-type contributions
13. Water education	Introduce IWRM into school programs to increase water knowledge and develop leadership among the youth, including responsibility for water monitoring in local water bodies
14. Watershed management	Invest to protect and rehabilitate upper watersheds in collaboration with local communities and civil society organizations
15. Environmental flows	Introduce a policy and implementation framework for introducing environmental flows and demonstrate its application

IWRM element	Typical interventions/criteria
16. Disaster management	Investments in combined structural and nonstructural interventions to reduce vulnerability against floods, droughts, chemical spills and other disasters in the basin
17. Flood forecasting	Introduce or strengthen effective flood forecasting and warning systems
18. Flood damage rehabilitation	Investments in the rehabilitation of infrastructure after floods
19. Water quality monitoring	Initiate or strengthen basin-wide water quality monitoring and application of standards
20. Water quality improvement	Invest in structural and nonstructural interventions that reduce point and non-point water pollution
21. Wetland conservation	Invest to conserve and improve wetlands as integral part of the river basin ecosystems
22. Fisheries	Introduce measures to protect and improve fisheries in the river
23. Groundwater management	Institutionalize and strengthen sustainable groundwater management as part of IWRM
24. Water conservation	Institutionalize a policy and implementation framework to promote efficiency of water use, conservation, and recycling
25. Decision support information	Improve on-line publicly available river basin information systems to support IWRM policy, planning, and decision-making, including dissemination of "tool boxes" and good practices

APPENDIX 7: PROPOSED GUIDING PRINCIPLES

... as identified during Phase 1 (CamboWP and CNMC June 07):

Considering the sparse resources available for the purpose, a minimalistic planning is considered as practical. Furthermore, on the bottom line, a minimalistic plan may have a larger development impact.

Proposed guiding principles are listed in the table below.

Context	
1	Full compliance with national development goals, policies and preferences
2	Full compliance with the routine operation of provincial departments <i>This relates to for example investment planning; preparation of annual budgets; monitoring and reporting; and services to the public.</i>
3	Level of effort in harmony with the resources and capacity available <i>The planning should be as simple as possible. Initially, it may produce a few documents and data compilations. Ideally, the planning should reduce the workload of the provincial departments, rather than add to it.</i>
Dialogue and participation	
4	Smooth dialogue and seamless interfaces between departments, avoiding gaps and overlaps <i>This relates to for example development of agriculture and fisheries; development of urban and rural water supply; industrial water utilization; flood and drought management; management of river and wetland habitats; and water-related development within tourism and recreation</i>
5	Openness in the planning process <i>... between departments and towards stakeholders and the general public</i>
Active development	
6	Orientation towards active development <i>... that can support (i) expanded, affordable and sustainable water availability; (ii) improved water efficiency; (iii) higher value generated by water utilization and water-dependent production systems; (iv) support to water-dependent livelihoods; (v) management of floods and drought; and (vi) general public awareness of efficient and appropriate water utilization</i>
7	A well balanced water allocation <i>... between (1) upstream and downstream water uses; (2) in-stream and off-stream (consumptive) water uses; and (3) present and future water uses</i>

APPENDIX 8: DATA COLLECTION FORMAT

The following check lists were applied for a similar survey in Kg Cham province in 2005 and a survey conducted in 2006 for the North West Irrigation Sector Project, Package 2

Cover sheet

Name:			
District(s):			
Commune(s):			
UTM location	1st reading	E: <input type="text"/>	N: <input type="text"/>
	2nd reading	E: <input type="text"/>	N: <input type="text"/>
WUG established? (tick one):		<input type="checkbox"/> Yes <input type="checkbox"/> No	
Water source: (tick one or several)		<input type="checkbox"/> Rain <input type="checkbox"/> Flood water <input type="checkbox"/> River/stream <input type="checkbox"/> Lake <input type="checkbox"/> Groundwater	
Name of river/stream/lake:			
Year of construction:		<input type="checkbox"/> Not known	
Year of rehabilitation:		<input type="checkbox"/> Not known <input type="checkbox"/> Not rehabilitated	
Reservoir area:		(ha)	<input type="checkbox"/> Not known <input type="checkbox"/> No reservoir
Reservoir volume:		(m3)	<input type="checkbox"/> Not known <input type="checkbox"/> No reservoir
Status (tick one or several):		<input type="checkbox"/> Operational <input type="checkbox"/> Needs repair <input type="checkbox"/> Not known <i>If repairs are needed, please explain under 'comments' below</i>	
No. of households served:		<input type="checkbox"/> Not known	
Irrigated area, wet season:		(ha)	<input type="checkbox"/> Not known <input type="checkbox"/> Not relevant
dry season:		(ha)	<input type="checkbox"/> Not known <input type="checkbox"/> Not relevant
Yield wet season:		(t/ha)	<input type="checkbox"/> Not known <input type="checkbox"/> Not relevant
dry season:		(t/ha)	<input type="checkbox"/> Not known <input type="checkbox"/> Not relevant
Other questions			
Cultivation affected by floods?		<input type="checkbox"/> Often <input type="checkbox"/> Sometimes <input type="checkbox"/> Seldom/never <input type="checkbox"/> Not known	
Cultivation affected by drought?		<input type="checkbox"/> Often <input type="checkbox"/> Sometimes <input type="checkbox"/> Seldom/never <input type="checkbox"/> Not known	
Other problems?		<input type="checkbox"/> Yes <input type="checkbox"/> No	(If 'yes', please explain below)
Photos taken?		<input type="checkbox"/> Yes <input type="checkbox"/> No	Map/diagramme collected? <input type="checkbox"/> Yes <input type="checkbox"/> No
Comments (if any):			

Data collection checklists

Note: If there is a WUG there would also be an irrigation scheme - and if there is an irrigation scheme you would expect some cultivation to take place.

Cultivation

Typical crops - dry season and wet season

Cultivation cycles: Normal, alternative, supplementary - most recent one - type of rice grown (with duration between sowing, planting and harvesting) - as much info as possible - preferably by date (rather than by month)

Supplementary crops - livestock - fisheries - other supplementary livelihoods

Water source(s): Rainfed - flood water - groundwater - irrigation (perhaps a combination)

Soil quality: Suited for crops other than rice?

Obstacles to cultivation and/or marketing

Livestock? Fisheries within the irrigated area (reservoirs, paddy fields)?

Use of fertilizers - kg/ha - wet season and dry season

Use of pesticides - wet season and dry season - if yes, please clarify

Whether affected by floods? If 'yes', when was the last time? Typical impacts?

Whether affected by drought? If 'yes', when was the last time? Typical impacts?

Whether affected by pests? If 'yes', please clarify. When was the last time? Typical impacts?

Expenses (rice): Labour (planting and harvest, others) - seeds - fertilizers - pesticides (riel/ha)

Land rental (if any)? (per ha)

Yield (rice) (dry season and wet season) - most recent - normal (t per ha)

Income (rice): Farm gate price (wet and dry season) - most recent - normal (riel per kg)

Income, other crops (wet and dry season) (riel per household or per ha)

Any income other than from cultivation (riel per household)? If 'yes', please explain

Approximate annual household income (1) from cultivation; (2) from other livelihoods

Issues and concerns, as relevant

Irrigation schemes

Conceptual description

Some of the Cambodian irrigation schemes are complex. Please provide a very clear conceptual description of the scheme - like you would explain it to a child:

- What are the structural elements - canals, gates, weirs, reservoirs, etc. What is their intended function?
- Please draft a small diagram of structural elements
- Where does the water come from (in the first place)? How does it reach the scheme? How is the flow controlled? Where does the water go - and how does it reach the Mekong eventually?
- Is there any regulation upstream? Is there any regulation or any withdrawals downstream?
- Please draft a small diagram of the flow from upstream to downstream.
- What are the main problems (if any)?
- What is the potential for development?

Main components: Reservoirs, gates, primary and secondary canals

When was the scheme first built?

Has it ever functioned well? If so, until when?

Reasons for malfunctioning

Suggestions on upgrading (rehabilitation, expansion, other improvements)

Sources of water for irrigation during the cultivation cycle

Unserved needs of irrigation water during the cultivation cycle - when?

Sources of water for household purposes during the year - and costs (if paid for)

Any problems with household water? Quality? Quantity? Access? If 'yes', please clarify

Any problems with water-related diseases? If 'yes', please clarify

Whether affected by poor water quality (for irrigation)? If 'yes', please clarify

Need of fish passages - today or in the future? If 'yes', please clarify

Land ownership: How many households own their land, and how many rent it?

Access to information about the weather (rainfall, waterlevel in Tonle Sap, floods, drought):

From where? Adequate?

Access to information about scheme operation? Adequate? If 'no', please clarify

Access to information about crops and cultivation issues? Adequate? If 'no', please clarify

Who decides about operation and maintenance of the irrigation system? Is the decision process functional? If 'no', please clarify

Issues and concerns, as relevant

WUGs

Formal status (bylaws available? If yes, approved by MOWRAM?)

Levels of organization (1, 2 or 3)

Water fee?

Whether water fee is paid - if 'no', why not?

Financial management - adequate? If 'no', please clarify

Communication and collaboration between WUG members - adequate? If 'no', please clarify

Communication with PDWRAM - adequate? If 'no', please clarify

Communication with PDAFF - adequate? If 'no', please clarify

Please indicate anything that could be improved to support the function of your organization:

Better information? Telephone, Internet, PCs? Cars, motorbikes? Monitoring equipment?

Clearer mandate? More authority? More staff? Capacity-building (if 'yes', please specify)?

Higher budget? Better public awareness? Others (please specify)?

Issues and concerns, as relevant

Origin: NWISP-2 (Dec 06): Guideline: Hydraulic assessment of irrigation schemes. Prepared for MOWRAM by PRD Water

Environment in association with DHI Water

Environment under North West Irrigation Sector Project, river basin and water use studies, Package 2, Dauntri and Boribo Sub-basins