



# The MRC Basin Development Plan

## Training and Capacity Building

BDP Library Volume 15

December 2004  
Revised December 2005

Mekong River Commission





# BDP

The MRC Basin Development Plan

**Training**

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Mekong River Commission



# Foreword

The BDP Library was compiled towards the end of Phase 1 of the BDP Programme. It provides an overview of the BDP formulation, together with information about the planning process and its knowledge base, tools and routines.

The library incorporates the essence of more than a hundred technical reports, working papers and other documents. It consists of 15 volumes:

- 1 The BDP planning process
- 2 Sub-area analysis and transboundary planning
- 3 Sub-area studies (including 13 sub – volumes)
- 4 Scenarios for strategic planning
- 5 Stakeholder participation
- 6 Data system and knowledge base
- 7 MRCS Decision Support Framework (DSF) and BDP applications
- 8 Economic valuation of water resources (RAM applications)
- 9 Social and environmental issues and assessments (SIA, SEA)
- 10 IWRM strategy for the Lower Mekong Basin
- 11 Monographs. March 2005
- 12 Project implementation and quality plan
- 13 National sector reviews
- 14 Regional sector overviews
- 15 Training

The work was carried out jointly by MRC and the NMCs with comprehensive support and active participation by all MRC programmes and more than 200 national line agencies. Financial and technical support was kindly granted by Australia, Denmark, Japan, Sweden and Switzerland.

The library has been produced for the purpose of the BDP and is intended for use within the BDP Programme. The work was done from 2002 to 2005, and some information may already have been superseded by new developments and new knowledge. The library does not reflect the opinions of MRC nor the NMCs.

It is hoped that the work will contribute to the sustainable development of water resources and water-related resources in support of the MRC vision of *'an economically prosperous, socially just and environmentally sound Mekong River Basin'*.



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# Acronyms and abbreviations

ADB	:	Asian Development Bank
ASEAN	:	Association of South East Asian Nations
BDP	:	Basin Development Plan (of the Mekong River Commission)
CNMC	:	Cambodia National Mekong Committee
DSF	:	Decision-Support Framework (of MRC)
EIA	:	environmental impact assessment
FMM	:	flood management and mitigation
GMS	:	Greater Mekong Sub-Region; Greater Mekong Sub-Regional Economic Cooperation Programme
HRD	:	human resources development
ICEM	:	International Centre for Environmental Management
IWRM	:	integrated water resources management
LMB	:	Lower Mekong Basin (the Mekong Basin parts of Cambodia, Lao PDR, Thailand and Viet Nam)
LNMC	:	Laos National Mekong Committee
MDBC	:	Murray-Darling Basin Commission
MDG	:	Millennium Development Goals
MRC	:	Mekong River Commission
MRCS	:	Mekong River Commission Secretariat
NA, n/a	:	not applicable
NGO	:	non-governmental organization
NMC	:	National Mekong Committee
NRE	:	natural resources and environment
PPA	:	Participatory Poverty Assessment
RAM	:	Resource Allocation Model
RBC/RBO	:	River Basin Committee/Organization
SA	:	sub-area (of the MRC Basin Development Plan)
SIA	:	social impact assessment
TNA	:	training needs assessment
TNMC	:	Thailand National Mekong Committee
UN	:	United Nations
VNMC	:	Viet Nam National Mekong Committee
WUP	:	Water Utilization Programme (of MRC)

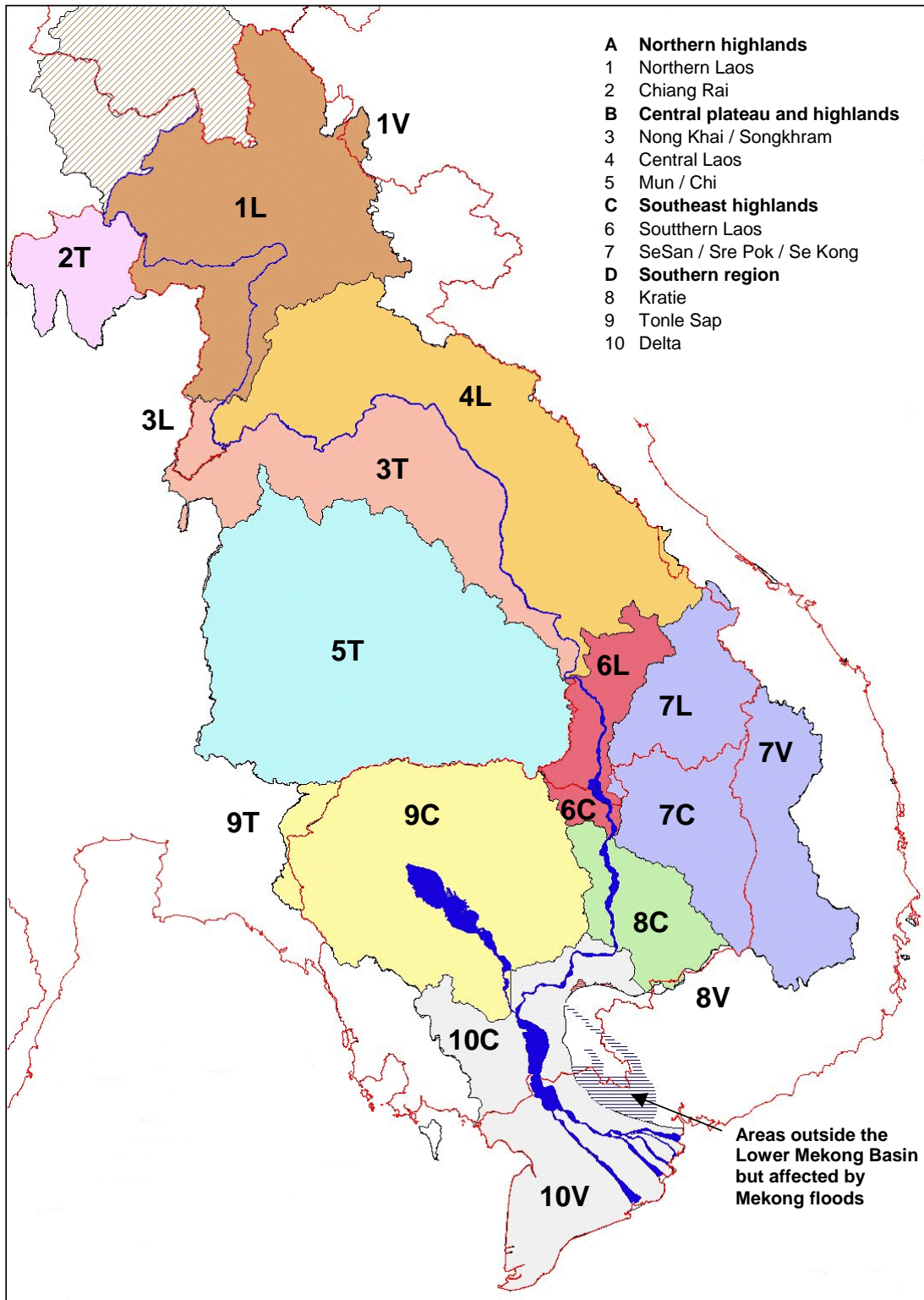
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# Map of BDP sub-areas



# Executive summary

BDP Phase 1 included a series of national training needs assessments (TNAs), an analysis of training scope and modalities, and implementation of a regional training programme targeted to the needs of the BDP.

The TNAs were conducted jointly for Cambodia and Lao PDR, and separately for Thailand and Viet Nam. This was in order to adapt to the national institutional frameworks (which resemble each other, but which still have some individual features).

In each case, the TNA comprised

- (i) an assessment of required competencies for the various BDP bodies;
- (ii) an assessment of the training that is recommended in order to meet the requirements; and
- (iii) suggestions on scope and implementation modalities.

The required competencies are summarised in the following table:

Required competencies	BDP Sub-Committee	National Working Groups/ BDP Unit	Sub-area Working Groups
National Development Policies and Plans	x	x	x
Regional development planning and cooperation	x		
Regional initiatives (GMS, East-West Corridors, etc. )	x		
Environment and transboundary issues	x		
International river basin development and cooperation	x		
IWRM, basic integrated river basin planning	x	x	x
Public participation and stakeholder analysis	x	x	
Network, strategic alliances	x		
Facilitation, negotiation, consultation, dialogue	x	x	x
Communication		x	x
Training capability		x	
Project design and planning		x	x
Action research		x	
Sub-area study and analysis		x	x
DS decision-support tools		x	

Viet Nam has applied a different rational for the evaluation of BDP-related competencies. A distinction has been made between 5 management levels, as follows:

Management level	Required competencies
1: Policy decision makers	National problems Regional problems International problems Leadership, negotiation, presentation and dialogue skills Public participation and stakeholder analysis
2: Policy makers	The necessity of national basin planning and regional linkage relationship Introduction of the BDP framework; brief basin planning process Water resources planning process, including the need of sustainability Sectoral planning process with BDP prospect Introduction of decision-support tools Some contents on the specific sectors' planning processes
3: Project development officers	General planning skills Managerial skills Technical subjects
4: Technical staff	Data management and information systems Information technology applications for the new Data Sharing Protocol Using some software programs/models in river basin and water management. Designing, formulating and using tools for sector planning and sub-area planning processes in the view of over-all basin management
5: Local (LMB provincial) government authorities	The necessity of National Basin Planning and Regional linkage relationship Introduction of the BDP framework and approach; the basin planning process

Following this analysis, a number of training modules were identified. The following list is a synthesis of the suggestions raised by each country:

Process-related training:	Communication, negotiation and presentation skills Workshop management Facilitation, conflict prevention and conflict resolution Action research and participatory survey techniques Stakeholder analysis and public participation
Technical issues:	Strategic planning and management IWRM and Integrated River Basin Planning Information analysis and sector review Decision-support tools (including the DSF) Transboundary issues & cause-effect analysis Project identification and formulation Project cycle management and Logical Framework Environment management IT training

The training itself took place in many ways at the regional, national and sub-area level.

The regional MDBC Training Programme was delivered by the Murray-Darling Basin Commission and the MRC Secretariat during 2003 and 2004. It consisted of the following four dedicated training sessions:

- 1 Introduction to basin planning
- 2 Application of basin planning principles
- 3 Scenario-based planning for the Mekong Basin
- 4 Study tours of Lower Mekong Basin and the Great Lake of Tonle Sap

Near the end of BDP Phase 1, a scope is seen for continuation, consolidation and expansion of the training.

Since there are visible overlaps in the training needs of each MRC programme, a scope is seen for a continued coordination under the MRC Capacity-Building Programme. This coordination was not fully achieved during BDP Phase 1 because the Capacity- Building Programme was temporarily discontinued.





# 1 Introduction

The MRC Basin Development Plan (BDP) was instituted by the April 1995 Mekong Agreement. Following a series of preparatory studies, the BDP project document was approved by the MRC Council in October 2000. The BDP formulation (Phase 1) started in October 2001 and is scheduled for completion in July 2006.

The vision of the Basin Development Plan (BDP) is to contribute to acceleration of inter-dependent sub-regional growth by establishing a process and framework conducive to investment and sustainable development. To contribute to this vision, the BDP process being undertaken by the Mekong River Commission (MRC) should establish a planning framework for development programmes, capable of balancing efficient use of resources with protection of the environment and the promotion of social justice and equity.

There are two main outputs sought from the first phase of the BDP programme. First, the establishment of a more participatory form of basin planning than has previously existed in the Lower Mekong Basin for use in subsequent planning rounds. Second, an agreed short-list of high priority development projects with basin-wide or trans-boundary significance which have benefits that transcend national borders.

This report presents an introduction to the training activities that were carried out under BDP Phase 1 with an emphasis on the regional and national level activities.

## 1.1 Origin of document

The document is a compilation of working papers prepared between December 2002 and December 2004:

MDBC and MRC (May 04): Tour report. Basin Development Planning - Mekong River Basin study tour 2-11 May 2004. Mekong River Commission - Murray-Darling Basin Commission Strategic Liaison Programme Phase II

MDBC and MRC (Dec 04): Tour report. Basin Development Planning - Tonle Sap Great Lake study tour 13-15 December 2004. Mekong River Commission - Murray-Darling Basin Commission Strategic Liaison Programme Phase II

MRCS (Dec 02): Training needs assessment & BDP indicative training plan for Cambodia and Lao PDR. Prepared by Sucht Katima for Cambodia National Mekong Committee, Laos National Mekong Committee, and Mekong River Commission Secretariat

TNMC (May 04): Training and capacity support assessment of BDP organizations and human resources in Thailand. Prepared for Thailand National Mekong Committee

VNMC (Jun 03): Training needs assessment and BDP indicative training plan for Viet Nam. Prepared by Cao Dat Khoa for Viet Nam National Mekong Committee

## 1.2 Basis and context

### 1.2.1 Link/relationship of subject to IWRM

IWRM spans across sectors and across administrative boundaries. At the same time, many decision-makers and practitioners have sector-related educations and '*deep*' as much as '*broad*' core competencies.

The implementation of basin-wide IWRM requires a comprehensive individual training and institutional capacity-building in order to build and support the dialogue between sectors and a holistic, integrated perspective. People who are experts in one discipline must acquire some basic insight into other disciplines and into the over-all planning context in order to contribute to the process in the best way.

This need is clearly reflected in the training needs assessments and related recommendations that are summarized in the present report.

### 1.2.2 Link/relationship of subject to BDP Inception Report

The scope and approach to training and capacity-building were comprehensively discussed in the Inception Report (Section 4.5 and Annex F). The actual implementation took place without significant deviations.

### 1.2.3 Link/relationship of subject to other BDP reports / activities

An initial training needs assessment for the BDP was carried out, discussed at workshops, and reported by each member country between January and October 2000.

The training activities have, between them, produced a large volume of training notes and overhead presentations. Many of these have been compiled and broadly disseminated in the '*BDP Archive*' CD.

### 1.2.4 Link/relationship of subject to BDP's Logical Framework Matrix

The training and capacity-building is included in the logical framework matrix as follows:

- Output 1.4 Trained staff
  - Activity 1.4.1 TNA and training plan
  - Activity 1.4.2 Identify training institution(s)
  - Activity 1.4.3 Course material
  - Activity 1.4.4 Training

## 1.3 Significance

Relevant competencies and adequate institutional capacity are preconditions for successful strategic planning.

The Lower Mekong Basin represents a particularly broad range of water-related issues and development opportunities, with visible differences from one country and sub-area to another. A good understanding of issues across geographical borders and across sector

boundaries is required for successful formulation of integrated development strategies that can add value to the national and sub-basin development efforts.

The BDP process in itself is innovative, and many approaches and procedures have been established between the member countries in an iterative way, while '*learning by doing*'.

Accordingly, the need of continuous training and capacity-building has been acknowledged as an integral part of the BDP process throughout Phase 1, and has been emphasized as equally important during the formulation of the Phase 2.

## 2 Summary of approach

### ***Background and objectives***

In order to institutionalize the basin planning process in the MRC institutions, it is important that a sustainable number of planners and technical specialists, both at the MRCS and at the four NMCs, are capable of all the competencies needed for formulating and producing the various BDP outputs. With this objective, the knowledge and capacity building process has been integrated into the BDP process since the beginning and will be carried out throughout the project life in parallel with the planning process and public participation.

On this background, a training needs assessment has been conducted in order to:

- 1 Identify the gaps between the required and available human capacity among planning practitioners having a key role to play in BDP formulation at regional, national, provincial and sub-area level within the institutions of the Secretariat, NMCs, line agencies and working-groups of the basin.
- 2 Draft an Indicative BDP Training Plan with a list of identified training institutions in such a way that it can become part and parcel of the MRC Integrated Training Strategy and Programme.

### ***The TNA process***

The TNA process was structured as a so-called '*competency-based and participatory TNA process*' with active participation by national players at both national and sub-area levels. The process can be summarized as followed:

*Organizational analysis:* This is to identify core BDP competencies and required human resource capacity to fulfill the BDP objectives and expected outputs. The project logical framework matrix was used to draw up the matching BDP competencies which have been further elaborated in Annex I.

*Operational analysis:* This is to analyze the operating structure and functional distribution system of each country BDP Organizational Framework. This was done by studying and analyzing the National BDP organizational set up, roles and responsibilities of each national team (sub-committee, national unit at NMC, Line Agencies and Sub-area level) and their working procedures.

*Using participatory approach, identify required competencies and associated skills for each national BDP element.*

*Human resource capacity analysis.* This is to determine/assess capability of each team member against the required competencies. The results are the so-called competency gaps which needed to be improved through training/human resource development process. These were determined as follows:

Required competences - existing competences = competency gaps

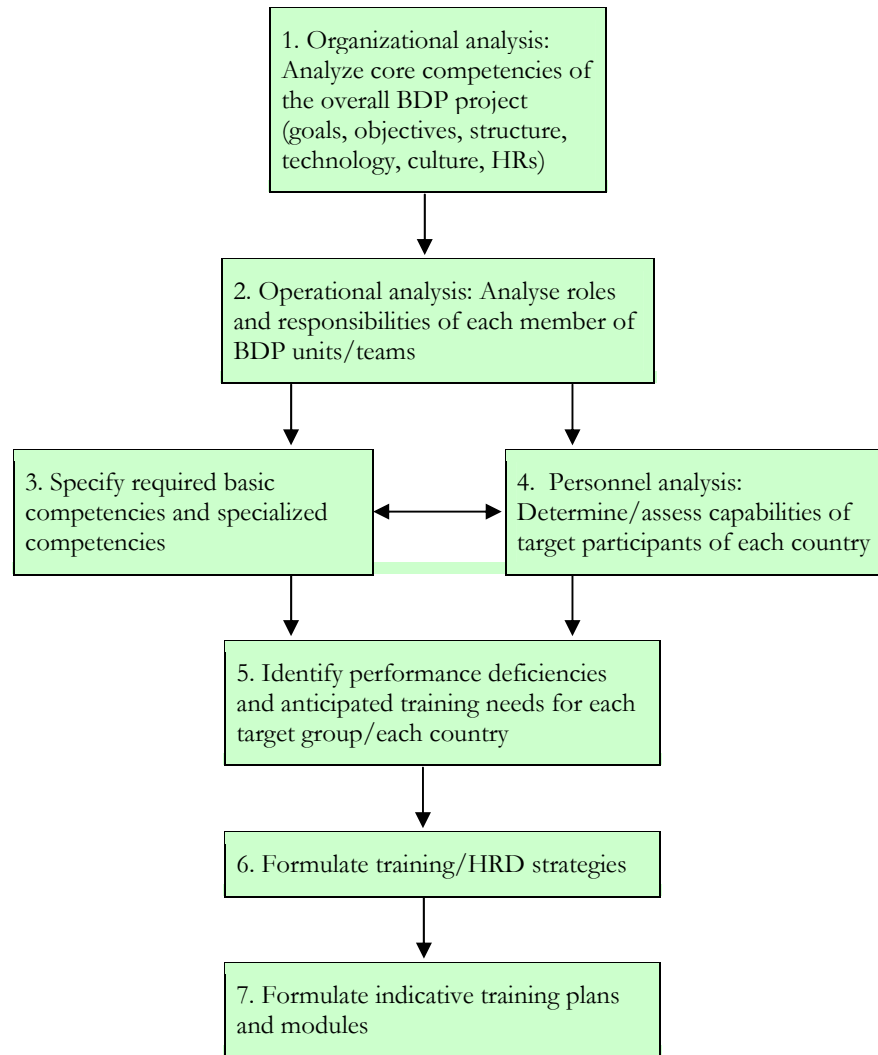
*Prioritizing the training activities* to ensure that the immediate competency requirements are addressed corresponding with the 2003 BDP workplan and milestones. This process was done by identify basic skills and knowledge each BDP team must have, to enable them to undertake the planned activities and produce the outputs accordingly.

*Formulate training strategies and criteria for selecting training institutions and trainers.*

*Development of indicative training modules.*

The TNA was conducted jointly for Cambodia and Lao PDR, and separately for Thailand and Viet Nam. This was in order to adapt to the national institutional frameworks (which resemble each other, but which still have some individual features).

Figure 2.1: The applied TNA process







### 3 Cambodia





## 3.1 Introduction

The TNA in Cambodia and Laos was carried out from December 2 to December 16, 2003.

## 3.2 BDP core competencies

Though organized differently to be in line with their national planning framework, BDP functions in Cambodia and Laos can be divided, functionally, into 3 levels, i.e. BDP Sub-Committee at policy & strategic level, BDP Unit and National Working Group at national planning & development level and Sub-area Working Group at the sub-area and provincial level. The BDP Core competencies and associated skills for each of this key BDP functions and required skills level have been formulated and agreed by participants at two national workshops. The following points are brief descriptions of the competencies and indicators for the Sub-Committee, National BDP Unit/Working Group and Sub-area Working Group respectively.

### 3.2.1 BDP Sub-Committee

The Sub Committee provides guidance and supervises the overall national formulation and implementation of the BDP. The SC oversees the activities of the NMCS BDP Unit and Working Group at both Central and Sub-Area Levels. It also addresses the completeness and the relevance of the BDP in terms of meeting the national needs and priorities. (Please refer to the BDP Inception Report, 22 July 2001 for the full TOR of BDP SC)

The BDP TNA workshops in Cambodia and Laos have identified core competencies for the BDP SC as follows:

#### *BDP-related competencies (acquire at least practice level)*

- 1 National Development Policies and Plans especially in water and related resources planning and management
- 2 Regional Development plan and cooperation
- 3 Regional Initiatives (GMS, East-West Corridors, Emerald Triangle, Golden Quadrangle, etc)
- 4 Environment and transboundary issues
- 5 International river basin development and cooperation
- 6 Integrated Water Resources Management

#### *Interaction-related competencies*

- 1 Public participation and stakeholder analysis
- 2 Network, strategic alliances
- 3 Facilitation, negotiation, consultation, dialogue

### 3.2.2 National Working Group/BDP Unit

Their primary responsibilities are to work as the national team to coordinate the implementation of the BDP at national and sub-area levels and provide guidance to the provincial Sub-Area Working Groups in macro-level issues of national concern with potential transboundary implications, mobilization information from sector plans to national and sub-area planning, sub-area analysis, scenario building, project review/revision, etc. (Full Terms of Reference of the National BDP Working Group is available in BDP Inception Report, 22 July 2001)

#### *Basic competencies*

Basic competencies are the knowledge, skills and ability that are considered important for all National BDP Unit/Working Group members involved in the formulation of BDP, regardless of their specializations. To be able to actively participate in and contribute to the BDP process, each member should have acquired basic competencies in the following areas:

- 1 Communication. (English language, computer, writing and presentation)
  - a. Can read, conceptualize, review and summarize project related documents, guidelines and references in English
  - b. Can use basic computer applications as the working tools and apply modern technology in communication
  - c. Can write required reports and disseminate information in English
  - d. Can present ideas, concept, findings clearly in the working group and public.
  - e. Demonstrate openness in sharing information and keeping people informed.
- 2 Facilitation (meetings/workshops, team building and facilitation)
  - a. Can design, plan, coordinate and facilitate training/working sessions, meetings, workshops, seminars.
  - b. Be able to plan, coordinate and facilitate public forum
  - c. To have a multi-disciplinary team approach in every stage of BDP, and to continually explore ways to enhance and improve cross discipline integration.
  - d. Works collaboratively with colleagues to achieve the BDP goals and willing to learn from each other.
  - e. Shows respect for and understanding of diverse points of view and demonstrates this understanding in daily work and decision-making
- 3 Training capability:
  - a. Be able to design, plan and deliver training programs in his/her specialized area(s) to interested stakeholders and Sub-area working groups
  - b. Be able to develop and use appropriate training materials and handouts
  - c. Be able to assess the readiness level of trainees and adjust his/her training program accordingly.

- d. Can coach, mentor and supervise on-the-job training of junior members and members of Sub-area working groups in his/her thematic area.
- 4 Project design and planning (regional, national and local plan; development cycle, strategic plan, development plan, workplan)
- a. Demonstrate working knowledge on regional/basinwide, national and local planning structure and process
  - b. Understand strategic planning process and development cycle
  - c. Demonstrated ability in writing project concept papers and formulating development plan
- 5 Public Participation (Stakeholder Analysis, Participatory Process)
- a. Can identify BDP stakeholders at national and Sub-area levels
  - b. Can conduct stakeholder analysis and facilitate the participation of stakeholders at national and Sub-area levels.
  - c. Can train Sub-area working group members on stakeholder analysis and participatory planning process and co-facilitate the public forum and community participation at the Sub-area levels.
  - d. Demonstrated skills in using participatory tools, methods of communication and method of involving the stakeholders in decision-making. e.g. PRA, OOPP., referendum and public opinion survey.
- 6 Action Research (Data collection, consolidation, analysis, interpretation)
- a. Be able to collect, consolidate, review analyze and describes information/data of national development plan (under his/her concerned sector and cross cutting issues).
  - b. Be able to train Sub-area working group members in conducting field survey of baseline information under his/her specialized sector.
- 7 Basic Integrated River Basin Planning
- a. Demonstrate working knowledge on the concepts and application of integrated basin planning
  - b. Demonstrate working knowledge on the BDP cross-cutting themes and transboundary issues:
    - i. Human Resource Development
    - ii. Socio-economic
    - iii. Environment

### ***Technical competencies***

Technical competencies are those skills and abilities which are directly related to the specialized areas to be contributed by different members of the BDP Unit. At the formulation stage of the BDP, it is important that a sustainable number of technical specialists at the national level must be capable of his/her specialized area(s) needed for producing various outputs at each of the 5 stages.

- 1 National water and related resource policy and plan (thematic areas and cross cutting areas). For this competence, it is envisaged that, in each of the following thematic areas, at least two members of the national working group must have extensive knowledge and demonstrated ability in articulate the sector plan of:
  - a. Irrigated agriculture
  - b. Fisheries
  - c. Navigation, transport, river works
  - d. Water supplies
  - e. Watershed management
  - f. Hydropower
  - g. Tourism and recreation
  - h. Flood control and management
  
- 2 Sub-area study and analysis (ecology, hydrology and meteorology, existing regional development activities). This is a competency of the whole national BDP team who are specialized in different sectors but will work as a group to complement each other in completing the analysis.
  - a. Be able to guide the Sub-Area Working Group in examine sectors and themes, and delineate sub-areas for a more focused analysis of local concerns and requirements as well as cross-boundary cause-effect relationships.
  
- 3 Use of the management support tools.
  - a. At least two members can use WUP Decision Support Framework Software in formulating scenarios and strategies.

### 3.2.3 Sub-area Working Groups (at provincial level)

At the time of this assessment, only one Sub-area Working Group has been established i.e., 1L Sub-area, which is the pilot Sub-area for Laos. Two officials (one member and another is an alternate member) from the Planning Division of each Province in the Sub-area have been appointed to the Working Group. These planners will work in close coordination with sector specialists in the province and the National BDP Working Group from line agencies. The SAWG is established to implement the BDP at the sub-area level by considering existing plans and local concerns to identify development opportunity and constraints concerned with water and related resources.

Required Competencies of these group are similar to the national BDP but more focus on the community-based information analysis, planning, communication and stakeholder participation..

#### ***Basic BDP competencies***

- 1 Communication (English language, computer, writing and presentation)
  - a. Can read, conceptualize, review and summarize project documents and references in English

- b. Can use basic computer applications as the working tool and apply modern technology in communication
  - c. Can write required reports and information in native language
  - d. Can present ideas, concept, findings clearly in the working group and public.
  - e. Demonstrate openness in sharing information and keeping people informed
- 2 Facilitation (meeting/workshops, team building and facilitation)
- a. Can design, plan, coordinate and facilitate meeting, workshop, seminar
  - b. Be able to plan, coordinate and facilitate public forum
  - c. To have a multi-disciplinary team approach in every stage of BDP, and to continually explore ways to enhance and improve cross discipline integration.
  - d. Works collaboratively with colleagues to achieve the BDP goals and willing to learn from each other.
  - e. Shows respect for and understanding of diverse points of view and demonstrates this understanding in daily work and decision-making
- 3 Project design and planning (national and local planning; development cycle, strategic planning, development planning, workplan)
- a. Demonstrate working knowledge on national and local planning structure and process
  - b. Understand strategic planning process and development cycle
  - c. Demonstrated ability in writing project concept papers and formulating development plan in native language.
- 4 Public participation (stakeholder analysis, participatory process)
- a. Can identify BDP stakeholders at the sub-area level
  - b. Can conduct stakeholder analysis and facilitate the participation of stakeholders at the sub-area level
  - c. Demonstrated skills in using participatory tools, methods of communication and method of involving the stakeholders in decision-making. e.g. PRA, OOPP., referendum and public opinion survey.
- 5 Action research (data collection, consolidation, analysis, interpretation)
- a. Be able to collect, consolidate, review analyze and describes information/data of national development plan (under his/her concerned sector and cross cutting issues)
- 6 Basic integrated river basin development planning
- a. Demonstrate working knowledge on the concepts and application of integrated basin planning
  - b. Demonstrate working knowledge on the BDP cross-cutting theme and transboundary issues and cause-effect relationships:

- i. Human resource development
- ii. Socio-economics
- iii. Environment

### ***Technical competencies***

- 1 National water and related resource policy and plan. The national sector review will be done mainly by the National BDP Working Group with the inputs and local data from members of the Sub-area WG. It is therefore essential that each member of the Sub-area WG have up-to-date knowledge of the following sector development in his/her respective Sub-area.
  - a. Irrigated agriculture
  - b. Fisheries
  - c. Navigation, transport, river works
  - d. Water supplies
  - e. Watershed management
  - f. Hydropower
  - g. Tourism and recreation
  - h. Flood control and management
  
- 2 Sub-area study and analysis (ecology, hydrology and meteorology, existing regional development activities)
  - i. Be able to examine sectors and themes, and delineate sub-areas for a more focused analysis of local concerns and requirements as well as cross-boundary cause-effect relationships

## **3.3 Organizational analysis**

### **3.3.1 The national Sub-Committee**

The Cambodia BDP Sub-Committee (CSC) composes of 15 members, 1 from each line ministry at Director General level plus 1 from National Committee for Disaster Management, 1 from Ministry of Interior and 1 from Ministry of Women Affairs. H.E. Sin Niny, the JC member, chairs the CSC. H.E. Hou Taing Eng, the deputy chairperson also acts as the representative of the Sub-Committee in the National BDP Coordination Unit.

### **3.3.2 National BDP Unit/National BDP Working Group.**

#### ***BDP Coordination Unit.***

Unlike LNMC which separates the NMC BDP Unit from the National Working Group, the Cambodian BDP Coordination Unit is composed of 3 Officials from the CNMC Secretariat, Officers in charge of planning, at deputy director and director of department level, from 10 ministries and representatives of MOI, MWAV and NCDM. The Coordination Unit is

headed by the Director General of Planning of the Ministry of Planning who also sit in the BDP Sub-Committee as the Vice Chairperson.

The human resource capacity of Cambodia BDP Coordination Unit is adequate covering all BDP sectors and cross-cutting themes. The compositions of the team is summarized below.

*Table 3.1: The BDP Coordination Unit, Cambodia*

Ministries
CNMC, Planning Dept.
LMUPC
MAFF
Ministry of Environment
Ministry of Foreign Affairs
Ministry of Industry, Mines and Energy
Ministry of Interior
Ministry of Planning
Ministry of Planning
Ministry of Tourism
Ministry of Water Resources and Meteorology
MPWT
MWVA

Major competency gaps can be summarized as follows:

- 1 Communication:
  - i English Comprehension, especially in the areas of documents/guidelines review, summarizing key points and formulating note for consideration/action papers for the policy makers.
  - ii Presentation skills
  - iii Information analysis and formulate technical/professional papers
- 2 Facilitation
  - i Facilitation and Organization of Workshop, Working Sessions
  - ii Team building in the skills of integration and coordination
  - iii Participatory training and working process
- 3 Project Design and Planning in the area of MRC and Regional Planning Process and key elements of development cycle.
- 4 Public participation and stakeholder analysis in most of the associated skills
- 5 Management including training capability and project management
- 6 Technical competencies especially in the areas of Natural Resource Management, transboundary issues and most of the skills required for conducting sub-area analysis i.e. regional development activities, action research and ecology).

## 3.4 Assumptions and risks

This BDP Planning process has demanded so much commitment and contribution from the respective National Mekong Committees, Line Agencies and Provincial Authorities. It is the first MRC Executing Project which expect full ownership and participation of the National Mekong Committees. To be able deliver 28 milestones and produce two major BDP outcomes by October 2003, the project must have commitment and dedication of all members of National BDP Working groups at all levels. At least 50% of each member's work days next year should be given to the BDP activities which comprise of interweaving processes of BDP planning, public participation and capacity building.

Though the time is limited and MRC is pressured to produce the draft BDP, the 3 parallel processes cannot be shortcut. It is therefore assumed that:

- 1 With proper training and technical assistance from a training institution/trainers, each National BDP Working Group will take active roles in conducting national sector review, sub-area studies and integrating public participation and social considerations in the process.
- 2 Policy Makers of Line Agencies and Provincial Governors are committed to the BDP formulation and recognize and encourage the active contribution of the National and Sub-area Working Groups members.
- 3 Training will not be conducted as an isolate activity but will be done as an integral part of the BDP Process with actual application and evaluation.
- 4 As one of the parallel process, the cost of these capacity building programme should be built into every BDP process and treat as the integral part of the BDP formulation activities.

## 3.5 Training strategies and programme outlines

### 3.5.1 Training strategies

The overall objective of this 2003 training programme is to build human resource capacity of the 4 National BDP Unit/Working Group and the Sub-area Working Groups to be able to carry out assignments and contribute to the 2003 milestones and the project outcomes. While the TNA indicated that to institutionalize the BDP planning process in the riparian countries, long term and on-going training programme will need to be carried out, it is anticipate that the identified competencies and associated skills will be the baseline information for designing the overall MRC Integrated Training Programme, soon to be commenced.

To plan and implement this training programme as a parallel process of the BDP planning process and public participation, the strategies for this 2003 training programme are:

#### *A. Using the competency-based training model*

- 1 ***Learn to do.*** Each training model will start with the participatory training sessions where concerned BDP members are trained on the concepts, techniques and tools to be employed to accomplish the real tasks as planned in the 2003 workplan.



- 2 ***Do to learn.*** Immediately after the new skills/knowledge have been acquired, the BDP members will then carry out their corresponding national assignments, e.g. national sector review, sub-area studies, transboundary issues meeting coordination, or public forum. During this implementation stage, the working group members are required to consult with the assigned trainer/mentor regularly to ensure that the work is carried out as planned with the agreed process and completeness.
- 3 ***Share to learn.*** After the assignment is completed, there will be an integration and evaluation workshop where each individual/group will have a chance to present their outputs and share the learning/working experience with other individuals/groups. The presentation will be the actual products as listed in the milestones, e.g. the Report on National Irrigated Agriculture Sector Review or the Results of 1L Sub-area studies. The presentation will then be consolidated by Head of National BDP Unit and BDP Coordinator. Lessons learned and practical experiences from the actual applications will be shared and innovative knowledge and skill will emerge and be institutionalized.

Competency-based training can not run on a piece meal basis or isolate from the actual BDP process of the BDP working groups because a competency is not what the person know but what the person does/apply in his/her actual work.

### ***B. Adaptation to BDP activities and BDP requirements***

There are two major outcomes to be achieved. Most of the members of National Working Group and Sub-area Working Group are concurrently occupying active posts and demanding jobs. The training course can not be done over along period of time. It must be practical and short. Actual BDP works like guidelines, working papers, workplan, etc. should be used as the references/practicum papers. In short, every module should address directly the required BDP related skills/knowledge. Since all the planners who have been appointed to NWG or SAWG are expected to acquire knowledge, skills and abilities to carry out the corresponding assignment immediately after the training period, the training objectives must aim to build up each individual trainee's knowledge, skills and ability as required by the job and must be based on the required competencies only.

Unlike many of the traditional training/workshop method, which adopted the "simultaneous" or class method, the competency-based training approach believes that a truly scientific education can never be developed so long as the trainees are treated as a class or a school of fishes. Instead, each trainee must be treated as an individual and different from others. "One size does not fit all". In designing a course or program for learning, a number of requirements must be taken into account. The trainers must consider not only the requirements of the task, but also the requirements of the trainees, the groups within which they work (geographical location and composition of the team, NWG, SAWG, etc), and the organization of which they are a part (NMC, Line Ministries, Departments, and Provinces).

### **3.5.2 Potential services providers**

With the limited time of this assignment, the consultant was able to identify and assess the capacity of a few potential local partners in Cambodia and Lao PDR in delivering some of the proposed courses. We have to keep in mind that this is the 1st LMB BDP planning process in the region, no academic or research institution in the two countries have ever had actual Integrate International River Basin Planning Experience. Therefore, a lot of technical assistance and guidance will have to come from MRCS and international river basin experts.

The basic courses like action research, training of trainers, information analysis and report writing, efficiency training courses can be delivered by local trainers with the assistance of MRC BDP team in providing the project information and real life case study. Criteria of selecting a training institution should include (but not limited to):

- 1 ***Prior experience in conducting “competency-based” training.*** This can be done by asking interested institutions/companies to submit a training proposal, course outlines and corresponding competency-based testing tools.
- 2 **Profile of trainers.** The proposed trainers should have experience in facilitating competency-based learning process. There are a lot of trainers who are used to a classroom teaching/lecturing but not mastery training or learner-centered training approaches.
- 3 ***Training facilities.*** The institution should have adequate training facilities (training rooms, equipment, group work facilities) and adequate administrative support. Since this intensive training would require trainees to be at the training site at least 8 hours a day, adequate facilities and utilities are quite important to the learning environment. For individual trainers, they must also responsible for renting and arranging the required training facilities and logistical support.
- 4 ***Willingness to tailor made the curriculum and training modules*** to meet the needs and priorities of BDP in 2003 and competency levels of trainees. A short-term international training consultant should be assigned to work with potential training institutions or trainers in developing curricula, course contents and case study to ensure the effectiveness of the course.

Potential training providers are listed in the following tables.

Table 3.2: National training providers, Cambodia

National training providers, Cambodia
<p><b>VBNK, Training Institute for Managers of Organizations Working for the Development of Cambodia, Phnom Penh</b>            VBANK is quite famous among NGOs in Cambodia delivering mostly project management, HRM and OD courses. They can also customize courses to meet their clients’ needs.</p> <p><b>Human-Earth Development Center, Phnom Penh</b>            Christ Lee, the founder of this organization has been working in this region for quite sometimes with AusAid and UNDP. His famous course which runs all year round for both private sectors and GOs is “Operacy” training programme. HEDC can be a potential partner in delivering customized courses on action research, project cycle, participatory training and team building.</p>

Table 3.3: Regional training providers

Regional training providers
<p><b>The Australian Mekong Resource Centre, University of Sydney, NSW, Australia</b> The Australian Mekong Resource Center was established in 1997 to promote research, discussion and debate on development and environment issues in the Mekong Region. The AMRC is a focal point for information, dialogue and activities in support of sustainable development in the Mekong Region. The training or technical assistance the AMRC can do for BDP are related to Transboundary Issues, Stakeholder Analysis and Information Analysis.</p>
<p><b>Regional Center for Social Science &amp; Sustainable Development, Faculty of Social Sciences, Chiang Mai University, Thailand</b> This regional center has been used by OXFAM to provide training courses on public participation and participatory development process.</p>

## 3.6 Indicative training modules

### *Module 1: Facilitation skills and teamwork*

The National BDP Working Group and Sub-Area Working Group have been recently formed in Cambodia and Laos by pooling planners from over 10 Government Ministries and 10 Provinces together. Majority of whom, have never been working together before. It is imperative that to get the National BDP teams to function smoothly and carry out the assignments together, acquiring competencies in leading, motivating and maintaining a team is essential.

This training module will actually be a series of working sessions of which the team members are required to work together to achieve the common goals.

### *Module 2: Information analysis and sector review*

To encourage ownership, the National Working Group members are assigned to undertake the national sector review. Each member is supposed to conduct the review of his/her own respective sector (e.g. MAFF planner will review the national irrigated agriculture sector and Dept. of Fisheries' planner will do the Fisheries sector). While these planners have extensive experience and knowledge of their respective sector, the task still require intensive training on data gathering, document review and analysis and well as composing the Review Report. This module is designed to provide the basic training on information analysis and sector review techniques at the beginning of the assignment then the trainer should be available once a week to coach or guide the NWG in accomplish the task. Once, the sector reviews are completed, a workshop will be held to facilitate the presentation of the results of each sector review and their integration into the national development plan review.

This module will make the trainees able to conduct national sector review and carry out sub-area study and analysis and present the result in writing and orally within six weeks; and to facilitate the integration of national sector review results.

### ***Module 3: Action research and participatory survey techniques***

Members of National Working Group and Sub-area Working Group are required to conduct sub-area studies which include the collection of information and data at the community, district and provincial levels. Skills and techniques in conducting field survey, collecting and validating data as well as using participatory assessment tools are needed by the WG members. This module is also applying the competency-based approach i.e. Learn to do, do to learn and share to learn.

The module aims to enhance the participants' ability to conduct sub-area studies and analysis, and to generate sub-area studies reports.

### ***Module 4: Training of Trainers on participatory training and workshop management***

One of the main functions of NWG and SAWG is to design, plan, coordinate, facilitate, manage and document training sessions, workshops, seminars, forums and working sessions (there are over 20 events of this nature planned in 2003 for each country). It is therefore vital that those identified NWG and SAWG members who are tasked to carry out these participatory functions are equipped with essential participatory training and facilitation skills to enable them to carry out the planned meetings/workshops effectively and efficiently.

Selected National Working Group Members will be able to design, plan, coordinate, facilitate training sessions, meetings, workshops, seminar effectively meeting the expected outputs and appropriate with level of trainees, participants.

### ***Module 5: Transboundary issues & cause-effect analysis***

Most of the planning experiences of the members of NWG and SAWG are confined in the national administrative border and as identified in the TNA, the transboundary issues and interdependent relationship of the riparian states are of most interested. To prepare the NWG and SAWG for meeting with their partners on another side of the administrative fences, a national training workshop on transboundary issues and concept of catchment/sub-area should be given to the members before the transboundary meetings.

The module will make the participants able to identify transboundary issues in the sub-area and acquire demonstrated knowledge in socio-economic analysis and environmental cause-effect relationships.

### ***Module 6: Stakeholder analysis and public participation***

Public participation is one of the parallel process which needed to be integrated into the BDP formulation process. It is therefore vital that the members of NWG and SAWG acquired necessary skills in involving internal and external stakeholders in the process.

The module will make the NWG and SAWG members able to involve stakeholders in carrying out the sector review and sub-area studies as well as in formulating scenarios and strategies, and will provide demonstrated skills in facilitating community participation and public forums.

### ***Module: 7 Project identification and formulation***

The members of NWG and SAWG are responsible for generating long-list projects/programmes which meet the BDP criteria. This includes involving stakeholders and local communities in identifying development priorities and needs in their own sub-area/sector. To be able to carry out this major assignment, technical assistance from qualified trainers is needed.

The module will make the participants able to employ participatory approach in identifying priority projects and programmes that meet the local needs and support the regional development cooperation; and to formulate project identification/concept papers for the identified development activities.

### ***Module 8: Communication and efficiency***

The BDP is a very dynamic process and demand timely response and interaction between all BDP functional elements (MRC BDP, NBDPU, NWAG and SAWGs). Members of BDP must be able to communicate to each other directly via telephone and electronic mail. For example, the member of 1L SAWG from Houphan Province in Lao should be able to send requested information on sub-area studies to NBDPU overnight via e-mail. The member of 2L SAWG should also be able to download information about EIA result of a hydropower project in 2T from the DEDP website.

The aim of this module is that all BDP national and sub-area members have his/her own e-mail address, can use e-mail communication and search web-sites, and that all BDP members have adequate English writing and reading proficiencies to enable them to communicate to each other in English.





## 4 Lao PDR





## 4.1 Introduction

The TNA for Cambodia and Laos was conducted jointly, from December 2 to 16, 2003. In consequence, some of the sections in this chapter are identical with the corresponding sections in the preceding chapter, as indicated in each case.

## 4.2 BDP core competencies

Please refer to section 3.2

## 4.3 Organizational analysis

### 4.3.1 The national Sub-Committee

The Lao BDP Sub-Committee (LSC) composes of 9 members who are senior officials (Deputy Director General or Director General) of Central Planning Committee and key line agencies covering all 8 sectors and 3 cross-cutting themes. The LSC reports directly to the Chairman of the LNMCS, the Minister of the Prime Minister's Office in charge of Planning and International Cooperation.

The composition is well thought of and the members are very qualified and have demonstrated experience and skills in overseeing the formulation of the BDP covering 8 sectors and 3 cross cutting issues. Five members of the LSC have direct planning experience at the regional levels with ADB, World Bank, and other Mekong Initiatives. All of them have been involved in Mekong Cooperation for quite sometime and are familiar with the process. Extensive training and exposure trips have also been given to the team members prior to the start of BDP by MRC, ADB, World Bank and other institutions.

Due to the unavailability of the Sub-Committee members it was not possible to assess their current competencies against the required BDP competencies.

### 4.3.2 National Working Group/BDP Unit

The BDP Unit of LNMCS has 5 full-time personnel (one is currently enrolled in the BDP sponsored MSc. Programme) and one National Specialist. The roles of this unit are mainly the management of BDP implementation at national level, coordinate the involvement of national line agencies in the BDP process, facilitation and coordination of meetings, workshops, field studies, etc., dissemination of BDP documents, references, provision of logistics and administrative support and serving as the focal point of the BDP.

Due to the absence of the Head of National BDP Unit, the National BDP Coordinator has to also assume the responsibilities of the head of the unit. He is supported by three technical officers and one Secretary.

Unlike other countries, the national working group will also work with every Sub-area Working Group in every stage of BDP.

The Lao National Working Group is composed of 4 officers at LNMC BDP Unit and a planner from each of the line agencies plus representatives of Lao Women Union, Vientiane Municipality and the National University of Laos. While the project, administration, coordination and liaison responsibilities rest with the LNMC BDP Unit, the actual BDP technical works and planning formulation process are led by the Committee for and Planning and Cooperation (CPC).

Therefore, functionally, the BDP working group at national level as well as at the sub-area level are headed by CPC.

*Table 4.1: Agencies represented in the National Working Group*

Agencies
Committee for Planning and Cooperation
Faculty of Engineering and Architecture, National University of Laos
Lao Women's Union
Permanent Secretary Office, Ministry of Agriculture and Forestry
Planning Division, LNMC
Prime Minister's Office
Vientiane Municipality

Major competency gaps for the National BDP Working Group can be summarized as follows:

- 1 Communication
  - i. English Comprehension, especially in the areas of documents/guidelines review, summarizing key points and formulating note for consideration/action papers for the policy makers.
  - ii. Presentation skills in all areas
  - iii. Information analysis and formulate technical/professional papers
- 2 Facilitation
  - i. Facilitation and setting workshop objectives and corresponding agenda
  - ii. Team building in the skills of integration and coordination and networking
  - iii. Participatory training consensus building and prioritization
- 3 Project design and planning, in the area of:
  - i. Project mobilization, monitoring and reporting
  - ii. Strategic planning process
  - iii. Logical framework and formulation of indicators
- 4 Public participation and stakeholder analysis especially in involving external stakeholders, participatory planning and using participatory planning tools

- 5 Training capacity
- 6 Technical competencies especially in the areas of Natural Resource Management, transboundary issues and most of the skills required for conducting sub-area analysis i.e. regional development activities, action research and ecology.

### 4.3.3 Sub-area Working Groups

Sub-area 1L has been selected as the pilot sub-area for Lao PDR.

This SAWG will be lead by Deputy Director of General Planning, Committee for Planning and Cooperation. The working structure of Lao BDP working group is that the National Working Group and the Sub-area Working Group will work together in every stage of BDP. In fact, the decision has been made that at this stage there is only one BDP Working Group established/recognized by the Government. This Working Group composes of the 13 National Working Group members and a Chief of Planning Department of each Province in the 1L Sub-area (10 Provinces).

For the purpose of this TNA we have conducted a separate TNA for the SAWG members from the Provinces only. Key competencies gaps for this group can be summarized as follows:

- 1 Communication:
  - a. English comprehension, especially in the areas of reading and writing basic correspondence and report.
  - b. Using computer as communication and working tools
  - c. Lecturing and leading discussion
- 2 Facilitation
  - a. Plan, organize and facilitate meeting, workshop
  - b. Team building skills
- 3 Project Design and Planning in the area of
  - a. MRC and the Regional Planning Process
  - b. MRC Strategic Plan
  - c. Development cycle
  - d. Planning tools like logframe, OOPP
  - e. Formulating operational plan
- 4 Public participation and stakeholder analysis especially in involving external stakeholders, participatory planning and using participatory planning tools.
- 5 Management
  - a. Training capacity
  - b. Project management

- 6 Technical competencies especially in the areas of Natural Resource Management, transboundary issues and most of the skills required for conducting sub-area analysis i.e. regional development activities, action research and ecology.

## 4.4 Assumptions and risks

Please refer to section 3.4

## 4.5 Training strategies and programme outlines

This section is identical with section 3.5, except for the following table.

*Table 4.2: National training providers, Laos*

National training providers, Laos	
<b>Institute of Foreign Affairs</b>	<p>The Institute of Foreign Affairs was established in 1994 as the capacity building arm of the Ministry of Foreign Affairs. The main tasks of the institute are to train young diplomat for oversea posts, mentor Lao Government officials for Asian Cooperation and run 5 functional English Modules. At present, the institute has 12 instructors (7 Laos and 5 expatriates).</p> <p>At present, the institute runs 5 standard English Modules and the one which is relevant to the BDP is “English course for ASEAN purpose”.</p>
<b>National University of Laos, Faculty of Engineering and Architecture</b>	<p>The Faculty of Engineering and Architecture, NUoL can be MRC potential partners in delivering some of the WUP models and other IT tools. They, at present, have a joint IT development project with JIGA. To create critical masses in using DSF for simulation, scenario formulation and development strategies, NUoL should be implanted with this WUP model.</p>
<b>Tele &amp; Communication Training Institute, Ministry of Communication Transportation Post and Construction</b>	<p>The TCTI has been involved in the capacity building activities of LNMC for quite sometimes. It receives funding from SIDA and JIGA to run different courses for Government Officials. Last year, it was commissioned by UNDP to conducted “Competency-based TNA” of three rural provinces.</p> <p>The TCTI standard courses include Project Management, Communication and Facilitation, Computer for Development and TeleCom Technology.</p>
<b>Lao-American College of English and Business Studies, Vientiane</b>	<p>The LAC is quite well-known in providing English and internet training. It also offers undergraduate courses.</p>
<b>Participatory Development Training Center (Padete), Vientiane</b>	<p>Padete is well-known in using participatory approach in training and development. They have potentials in delivering the Public Participation and Stakeholder Analysis module in close cooperation with the MRC BDP team.</p>

## 4.6 Indicative training modules

Please refer to section 3.6



## 5 Thailand



## 5.1 Introduction

### *The TNA process*

The TNA assignment was carried out from September 13 to October 02, 2004 in Bangkok and nine provinces in the three Mekong river basin sub-areas in Thailand (Payao, Chiangrai, Udonthanee, Sakolnakorn, Khon Kaen, Srisaket, Yasothorn, Amnart Charoen and Ubon Rachathanee).

With full cooperation and assistance of BDP Unit and Regional Office of Water Resources (Region 1, Region 3, Region 4 and Region 5), interviews were conducted, and consultative meetings were held with 34 people who are directly involved in the BDP Programme (NWG 10, Consultants 2, Water Resources Experts 4, and SAWG 18).

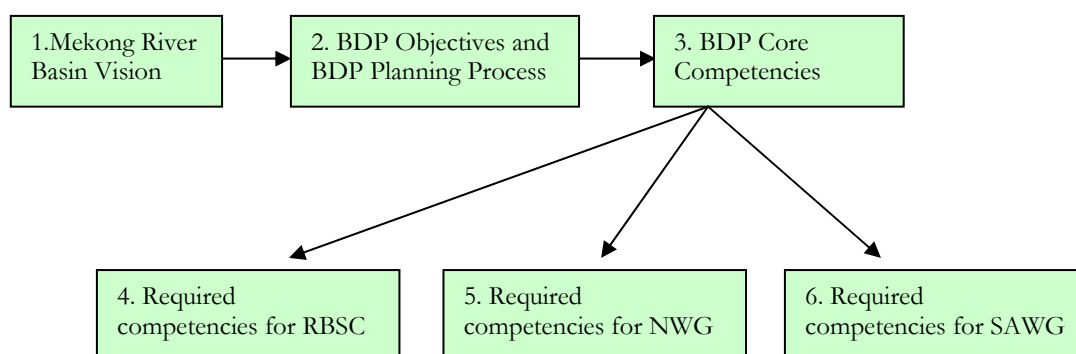
Also, a screening was made of Thai water resources policy, framework and planning process, based on the following documents:

- 1 National Sector Overview Integrated Report, TNMC BDP Unit, Thai National Mekong Committee Secretariat, Department of Water Resources, Ministry of Natural Resources and Environment. April 2004
- 2 Working Guidelines for Planning Integrated Water Resources Development Plan, Department of Water Resources, Ministry of Natural Resources and Environment. 2004.
- 3 Natural Resources and Environment and the Planning and Management of Water Resources, Office of Natural Resources and Environment, Yasothorn. 2004
- 4 Plan for Managing Environment at Regional Level, Manu Panphongplang, Office of Environment Region 1. 2003
- 5 Policy and Framework of Water Resources Management in Thailand, Mingsan Khaosa-ard and Company. Volume 1 and 2. 2001
- 6 Dhamma Yardtra for Mekong River Conservation, Rak Chiangkong Conservation Group. 2003
- 7 Workshop Proceedings of Improving Capacity of River Basin Organizations within Lower Moon River Basin Sub-committee, Office of Coordination and Management of Lower Moon River Basin, Region 5.

## 5.2 BDP core competencies

Required competencies of BDP derive from the functional elements of BDP Programme as stated in the BDP project documents as shown in the following flow chart.

Figure 5.1: Core competencies



***Vision of Mekong River Basin:***

An economically prosperous, socially just and environmental sound Mekong River Basin.

***Objectives of BDP Programme:***

- A participatory basin planning process established and ongoing
- A Basin Development Plan aiming at a balanced mix of social, economic and environmental factors drafted and agreed on

***Related core BDP competencies:***

- 1 Professional knowledge and experience
  - a. National Water Resources Development Plan and policies
  - b. Integrated river basin planning and management
  - c. Management support tools
  - d. Trans-boundary environment, social and economic issues
  - e. Sub-area development plan, planning process
  - f. Sector development and Issues (eight sectors and three cross-cutting)
- 2 Skills and attitudes
  - a. Information analysis and generation
  - b. Organizational development and working groups
  - c. Networking ability
  - d. Political and cultural ability
  - e. Training and disseminating capability



## 5.3 Organizational analysis

### 5.3.1 River Basin Sub-committees.

Thailand has begun using river basin based water resources development and management systems since 2002 by dividing the country into 25 river basins. They are Salawin RB, Kong RB, Kok RB, Chi RB, Moon RB, Ping RB, Wang RB, Yom RB, Nan RB, Chao Praya RB, Sakaekrang RB, Pa Sak RB, Thachin RB, Mae Klong RB, Prachinburi RB, Bang Prakong RB, Tonlesap RB, Eastern coast RB, Phetburi RB, Western Coast RB, Southern RB, Eastern RB, Tapee RB, Songkla RB, Pattanee RB, Southwestern RB. The twenty five river basins are further sub-divided into 254 sub-river basins and over 5,000 small basins.

The management of Water Resources of Thailand has been organized at three levels:

**National level:** National Water Resources Committee. The Committee is chaired by Deputy Prime Minister and composed of Permanent Secretary of nine Ministries and twenty three line agencies.

**River basin level:** Each river basin is managed by River Basin Sub-Committee. Some big river basins like Mekong, Moon and Chi are further divided into sub-basins like Kong1, 2, and 3, Lower Moon, Upper Moon, Lower Chi and Upper Chi. Each of these big sub-basins is managed by a RBSC.

**Tributary river basin level:** Each major river basin is further divided into sub-river basin to be managed by its respective local working groups at provincial, amphur and tumbol. Depending on the size of the river basin, e.g. Kong 3 river basin has 32 local river basin working groups while Kong 2 river basin has over 300 local river basin working groups.

#### *Composition of RBSCs*

At present, there are 29 River Basin Sub-committees established to oversee the development and management of the nation water resources. Each RBSC has about 35 – 40 members from four groups of stakeholders:

- 1 Concerned government agencies
- 2 Water users which include agriculture, industry, business and local administration
- 3 Academic institutions, local experts and indigenous trainers/kuru
- 4 Non-governmental organizations

#### *Roles and functions of RBSCs*

Appointed by the National Water Resources Committee, the RBSC is responsible for:

- 1 Development of water resources development policies, strategies and plans
- 2 Formulating the annual integrated water resources development plan
- 3 Facilitating the planning process and mediating conflicts
- 4 Informing the public about, and promoting IWRM

There are five RBSCs responsible for the areas under MRC BDP Programme. They are

- 1 Kong 1 & Kok RBSC covers 2T Sub-area
- 2 Kong 2 RBSC covers upper part of 3T Sub-area (Udon, Nongkai, Loei, and Nong Bualumpu Provinces)
- 3 Kong 3 RBSC covers lower part of 3T Sub-area (Nakon Panom, Sakon Nakhon, Amnart Charoen, and Mokdaharn)
- 4 Lower Chi RBSC covers upper part of 5T Sub-area (Kalasin, Roi-et, Kornkaen, etc.)
- 5 Lower Moon RBSC cover lower part of 5T Sub-area (Ubol, Srisaket, Yasothorn, etc.)

The Sub Committee provides guidance and supervises the overall river basin water resources plan formulation. The RBSC appoints three working groups at the RBSC levels to review, screen, integrate and endorse different plans from provincial and tributary river basin levels to respective Government agencies at the national level for budget allocation. For those RBSC under the Mekong Framework, each RBSC appoints a Sub-area Working Group to carry out the BDP planning activities. Therefore, the RBSC is directly responsible for the outcome of SAWG work and must have broad competencies as follows:

- 1 The Mekong Agreement and the MRC Strategic Plan
- 2 Regional development plan and cooperation (GMS, East-West Corridors, Emerald triangle, Golden Quadrangle, economic twin cities etc.)
- 3 Environment and transboundary issues
- 4 International water laws
- 5 Integrated river basin planning
- 6 Networking and strategic alliances

### 5.3.2 National Working Group (NWG)

Their primary responsibilities are to work as the national team to coordinate the implementation of the BDP at national and sub-area levels and provide guidance to the Mekong BDP Sub-Area Working Groups in macro-level issues of national concern with potential transboundary implications, mobilization information from sector plans to national and sub-area planning, sub-area analysis, scenario building, project review/revision, etc.

The Thai NWG has 22 members from 18 line agencies and has TNMCS BDP Unit as its secretariat. The key roles and functions of the NWG are to:

1. Provide scientific and technical information and advice on development opportunities and challenges to River Basin Sub-Committees and Sub-area Working Groups.
2. Develop and maintain a Basin Development Planning process with the involvement of appropriate stakeholders.
3. Prepare and provide analytical information and data on BDP formulation for consideration by the River Basin Sub-Committee and TNMC (Use Decision Support Tools in formulating scenarios and strategies). This includes 1. Analysis of Thai Mekong Basin Resources and Development Opportunities; 2. Analysis of Development Scenarios; 3. Strategy Formulation; 4. Compilation of Long-list of Programmes and Projects; 5. Compilation of short-list of Programmes and Projects.

4. Review and screen longlist and shortlist projects before presenting them to TNMC.
5. Work with other National Working Groups of the riparian countries

### ***Required competencies for NWG members***

Required competencies are the knowledge, skills and ability that are considered important for all National BDP Unit/Working Group members involved in the formulation of BDP, regardless of their specializations. To be able to actively participate in and contribute to the BDP process, each member should have acquired basic competencies in the following areas:

- 1 Communication. (English Language, Computer, Writing and Presentation)
  - a. Can read, conceptualize, review and summarize project related documents, guidelines and references in English
  - b. Can use basic computer applications as the working tools and apply modern technology in communication
  - c. Can write required reports and disseminate information in English
  - d. Can present ideas, concept, findings clearly in the working group and public.
  - e. Demonstrate openness in sharing information and keeping people informed.
- 2 Facilitation (meetings/workshops, team building and facilitation)
  - a. Can design, plan, coordinate and facilitate training/working sessions, meetings, workshops, seminars.
  - b. Be able to plan, coordinate and facilitate public forum
  - c. To have a multi-disciplinary team approach in every stage of BDP, and to continually explore ways to enhance and improve cross discipline integration.
  - d. Work collaboratively with colleagues to achieve the BDP goals and willing to learn from each other.
  - e. Show respect for and understanding of diverse points of view and demonstrates this understanding in daily work and decision-making
- 3 Training capability
  - a. Be able to design, plan and deliver training programs in his/her specialized area(s) to interested stakeholders and Sub-area working groups
  - b. Be able to develop and use appropriate training materials and handouts
  - c. Be able to assess the readiness level of trainees and adjust his/her training program accordingly.
  - d. Can coach, mentor and supervise on-the-job training of junior members and members of Sub-area working groups in his/her thematic area.
- 4 Integrated river basin planning
  - a. Demonstrate working knowledge on the concepts and application of integrated basin planning

- b. Demonstrate working knowledge on the BDP cross-cutting themes and transboundary issues:
    - i. Human Resource Development
    - ii. Socio-economic
    - iii. Environment
  - c. Demonstrate working knowledge on regional/basinwide, national and local planning structure and process
  - d. Understand strategic planning process and development cycle
  - e. Demonstrated ability in writing project concept papers and formulating development plan
- 5 Public participation (stakeholder analysis, participatory process)
- a. Can identify BDP stakeholders at national and sub-area levels
  - b. Can conduct stakeholder analysis and facilitate the participation of stakeholders at national and sub-area levels
  - c. Can train sub-area working group members on stakeholder analysis and participatory planning process and co-facilitate the public forum and community participation at the sub-area levels
  - d. Demonstrated skills in using participatory tools, methods of communication and method of involving the stakeholders in decision-making. e.g. PRA, OOPP., referendum and public opinion survey.
6. Action research (data collection, consolidation, analysis, interpretation)
- a. Be able to collect, consolidate, review analyze and describes information/data of national development plan (under his/her concerned sector and cross cutting issues).
  - b. Be able to train sub-area working group members in conducting field survey of baseline information under his/her specialized sector

### ***Technical competencies***

Technical competencies are those skills and abilities which are directly related to the specialized areas to be contributed by different members of the BDP Unit. At the formulation stage of the BDP, it is important that a sustainable number of technical specialists at the national level must be capable of his/her specialized area(s) needed for producing various outputs at each of the 5 stages. It is envisaged that, in each of the following thematic areas, at least two members of the national working group must have extensive knowledge and demonstrated ability in articulate the sector plan of:

- a. Irrigated agriculture
- b. Fisheries
- c. Navigation, transport, river works
- d. Water supplies
- e. Watershed management
- f. Hydropower

- g. Tourism and recreation
- h. Flood control and management

### 5.3.3 Sub-area Working Groups

Mekong river basin development falls under one of the twelve development plans set by the National Water Resources Committee, i.e. “Finding and developing international water resources”. In the BDP framework, the five RBSCs have created three SAWGs as follows:

- 1 2T SAWG. This SAWG was established on 15 March 2004 by the administrative order of Chiang Rai Governor in the capacity of Chairperson of Kong 1 and Kok RBSC
- 2 3T SAWG. This SAWG was created by combining two working groups, i.e., 3T1 established by Kong 2 RBSC and 3T2 by Kong 3 RBSC.
- 3 5T SAWG. This SAWG was created by combining two working groups, i.e. 5T1 established by Lower Chi RBSC and 5T2 by Lower Moon RBSC

*Table 5.1: Composition of Sub-area Working Groups*

SAWG	2T	3T1	3T2	5T1	5T2
Government agencies	9	9	8	2	5
NGOs	2	2	2	2	0
Scientific community	2	2	2	0	1
Water users	2	4	4	4	3
Total	15	17	16	8	9

Each SAWG is established to implement the BDP planning activities at the sub-area level by considering existing plans and local concerns to identify development opportunity and constraints concerned with water and related resources. For Thailand, the BDP planning process will rely heavily on the performance of the three SAWGs. All three SAWGs are tasked with the following terms of reference (as stated in the executive order of RBSCs Kong 1 & Kok, Kong 2, Kong 3, Lower Moon and Lower Chi):

- 1 Work closely with TNMC BDP Unit and National BDP Working Group in all areas related to the Mekong River Basin Planning.
- 2 Promote regular dialog with all stakeholders and local river basin working groups.
- 3 Review and consolidate existing information and data on the present situation of the river basin in regard to social, economic and the use of basin resources.
- 4 Review and appraise basin development plan on water and related resource proposed by local river basin working groups.
- 5 Identify development opportunity and constraints of local river basin, especially in regard to the relationship between upper and lower communities.
- 6 Formulate river basin development scenario based on the medium and long term projections on the use of water and related resources in the future.

- 7 Develop core strategies for sustainable development with full consideration of social equity, environment and economic growth.
- 8 Formulate projects and sound development plans to be considered at national level.
- 9 Coordinate and network with SAWGs of neighboring countries in regard to transboundary issues.
- 10 Work with other River Basin Working Groups within the same umbrella of the River Basin Sub-Committee to formulate Mekong Basin Development Plan.

Required competencies of these groups are similar to the national BDP but more focus on the community-based information analysis, planning, communication and stakeholder participation.

### ***Required BDP competencies for SAWGs***

- 1 Communication
  - a. Can read, conceptualize, review and summarize project documents and references
  - b. Can write required reports and information in native language
  - c. Can present ideas, concept, findings clearly in the working group and public
- 2 Facilitation (meetings/workshops, team building and facilitation)
  - a. Can design, plan, coordinate and facilitate meetings, workshops, seminars
  - b. Be able to plan, coordinate and facilitate public forum
  - c. Works collaboratively with colleagues to achieve the BDP goals and willing to learn from each other
  - d. Shows respect for and understanding of diverse points of view and demonstrates this understanding in daily work and decision-making
- 3 Training capability:
  - a. Be able to design, plan and deliver training programs in his/her specialized area(s) to interested stakeholders and small river basin working group at Amphur and Tumbon levels.
  - b. Be able to develop and use appropriate training materials and handouts
  - c. Be able to assess the readiness level of trainees and adjust his/her training program accordingly
  - d. Can coach, mentor and supervise members of small river basin working groups
- 4 Integrated River Basin Planning
  - a. Demonstrate working knowledge on national and local planning structure and process
  - b. Understand strategic planning process and development cycle
  - c. Demonstrated ability in writing project concept papers and formulating development plan in native language.

- d. Demonstrate working knowledge on the concepts and application of integrated basin planning
  - e. Demonstrate working knowledge on the BDP cross-cutting theme and transboundary issues and cause-effect relationships:
    - i. Human Resource Development
    - ii. Socio-economics
    - iii. Environment
- 5 Public Participation (stakeholder analysis, participatory process)
- a. Can identify BDP stakeholders at the sub-area level
  - b. Can conduct stakeholder analysis and facilitate the participation of stakeholders at the sub-area level
  - c. Demonstrated skills in using participatory tools, methods of communication and method of involving the stakeholders in decision-making. e.g. PRA, OOPP., referendum and public opinion survey.
- 6 Action research (data collection, consolidation, analysis, interpretation)
- a. Be able to collect, consolidate, review analyze and describes information/data of national development plan (under his/her concerned sector and cross cutting issues).
- 7 Development sectors knowledge
- a. Has knowledge and experience on development sectors which are relevant to the sub-areas, e.g., tourism is the potential sector of 2T, agriculture and fisheries are relevant development sectors of 3T and hydropower may be applicable to 5T.

## 5.4 Analysis of human resource capacity of Thai BDP teams

### 5.4.1 Context of Thai river basin planning

In accordance with the present Constitution of Thailand, capacity development of people organizations and public participation are the cross-cutting themes to be implemented by all Government agencies. In regard to water resources development and management, Thailand has put in place the integrated water resources management system at every level.

Following the countrywide reorganization of Thai Government Ministries and Agencies in October 2002, the administrative and technical arms of the Thai National Mekong Committee have been transferred to the newly created “Department of Water Resources” (DWR) under the newly created “Ministry of Natural Resources and Environment” (MNRE). The direction of Thailand cooperation with the lower Mekong countries is now been upgraded from Department level to the Minister and Permanent Secretary of the MNRE, the Council and the Joint Committee Members for Thailand. The elevation of the JC Member from Director General to Permanent Secretary has clearly indicated that Thailand is now proactively pursuing the goals of regional cooperation under the context of MRC.

All water resources development plans and policies are now under the direction of the National Water Resources Committee which composes of nine line ministries and 23 government agencies. The MNRE is tasked by the National Committee as the main coordination body on Water Resources.

The present Minister of NRE, Mr. Suwit Khunkiti is also the MRC Council for Thailand. Department of Water Resources is the Secretariat of both the National Water Resources Committee, and the Thai National Mekong Committee.

The study found that the operating structure of BDP Sub-area working groups is under the supervision of the concerned RBSCs. Skills, knowledge and capacity of the three SAWG different significantly. This may be due to the fact that there are different needs and priorities, problems and issues. Other factors contribute to the limited readiness level of SAWG members are that the groups have just been formed and have less knowledge about Mekong Cooperation and a lot of SAWG members are new to integrated river basin planning.

In general, the consultant was very impressed by the clear national vision, strategies and framework of water resources management. The National Water Resources Committee has set a clear vision that *“Within AD 2468, Thailand will have adequate and good quality water for use by having effectively managed organization and policies for water utilization which are sustainable and fair and promote quality of life with active participation of stakeholders at all levels”*.

The integrated water resources development planning process requires public participation and active involvement of all four groups of key stakeholders at every level.

Thailand has commenced the management of water resources using integrated river basin system for a few years already. There is a scope for Thailand to share its river basin planning process guidelines and lessons learnt with MRCS BDP Unit and all elements of the BDP in the other three countries.





## 5.4.2 Overall BDP competencies

### *Strong points of Thai river basin planning*

- Thailand has already managed water resources using river basin approach by divided the country into 25 river basins, 254 tributaries and over 3,000 small river basins. It has already established the national policy, framework and operating structure at all levels, i.e., National Water Resources Committee, 29 River Basin Sub-Committees and working groups at Tambon, Amphur and Province.
- Has Department of Water Resources as the main body for integrated all the water resources development and management plans. This DWR is also the Secretariat of the National Water Resource Committee as well as the Thai National Mekong Committee. Therefore, the development of national water resources and the regional cooperation on water resources are under the same operating structure and decision makers.
- There are several studies done on different river basins and all line agencies have their own database on water resources. In the last 3 years, there have been various studies done at both national level and river basin level. Therefore, the NWG and SAWG do not have to reinventing the wheels but use the existing research and studies in coming up with national sector overview and sub-area studies.
- Have well-established policy and guidelines on integrated river basin planning and public participation processes. All 29 RBSCs have used the planning process since 2002. Though, at the local or sub-basin level, the knowledge and skills in apply the process are still limited, there is no need for BDP Programme to establish another planning process.
- Thailand has spent over 1,200 million Baht (300 Million US \$) to have professional water resources companies conducting detailed study of all 25 river basin and plan long term water resources development plan. This study will be completed by March 2005. The information provided in this study can be used by NWG and SAWGs in setting core strategies and formulate projects for BDP as well.

### *Limitations*

- The importance and priority of MRC BDP activities. Working with other riparian countries for developing international water resources (including Mekong) is one of the twelve key outputs of the concerned RBSCs. Most of the members of each SAWG are also members of the respective RBSCs. Without proper and adequate human resource support and development, the works of MRC BDP may not receive high priority.
- Knowledge and experience on transboundary issues and international river basin development are very limited, especially at the SAWG level. Out of 18 members of SAWG interviewed, only six demonstrate adequate understanding of BDP objectives and expected outputs as well as some transboundary issues in their sub-area.

- There is no information and database on Mekong Development at any sub-area. There is a great need to have information center and database at each sub-area to serve the SAWG.

#### 5.4.3 National BDP Working Group

##### *Strong points*

- The NWG is composed of professional planners from different sectors who compliment each other on the planning process.
- All of them have actual experience in conducting research, studies and formulate development plan in their specialized areas.
- Majority of NWG members has experience in working and negotiating at regional and international levels.
- All NWG members are equipped with modern office facilities, modern management tools and are capable of using modern technology and tools for their works.

##### *Room for improvements*

- There is no regular meeting and information sharing system among NWG members. Some of the members do not know the progress of BDP Programme, information from MRCS and other countries on the same are not adequately and or timely disseminated to the members.
- NWG did not involved in the formulation of PIP and are not clear on what role/function he/she should play in implementing the PIP.
- Each NWG member is specialized in his/her own area(s) but do not have clear picture on Thai position regarding the Mekong River Basin Development and transboundary issues in each sub-area.

#### 5.4.4 Sub-area Working Groups

##### *Strong points*

- The composition of each SAWG is complete. It composes of representatives from the four main groups of stakeholders i.e. GO, NGO, Academe, and Water Users.
- Most of the SAWG members have good knowledge of problems, issues and development plan of their sub-areas and have interests and experience in facilitating planning process.
- Most of the SAWG members have actual experience in organizing and facilitating public forum and mobilizing local communities.
- Most of the SAWG members have actual experience in formulating water resources development projects.

### ***Room for improvements***

- Limited knowledge of Holistic Approach to development planning. Most of SAWG members are use to analyze and plan project in river basin based on Area and Function system. For example, Department of Fisheries would concentrate on fishery project while hydro power agency would also concentrate on building water reservoirs and dams without thinking about fishes.
- Most of the members of SAWG are not familiar with the “Process-Oriented” planning. They are use to “Project and Budget – Oriented” planning process. Proper planning process needs to be institutionalized especially at each sub-area.
- Working Group Principle. These three SAWGs have just been established and have not really work together as teams.
- Limited capacity in analyzing, conceptualizing and summarizing complex information. This is true especially for those members from Water User Groups.
- Limited knowledge and understanding MRC Cooperation, international river basin development and transboundary issues.
- Limited knowledge of and skills in integrated river basin planning and management.

## 5.5 Indicative training modules

### ***Module 1: Integrated River Basin Planning (IRBP)***

MDBC together with MRC BDP Unit has developed 4 IRBP modules and trained about 12 river basin planners of the four countries last year. MRCS has a plan to develop this course as the core training course for all professional staff of MRCS as well as those of the four National Mekong Committees. The writer has taken the course contents from the draft IRBP curriculum developed by MDBC trainers. It is in a draft form. The writer will work with MDBC experts and MRC BDP Unit to develop this course into a complete training package in October and will provide the same to TNMC Secretariat.

### ***Module 2: Strategic planning and management***

This is a standard training course developed by the writer to train MRCS and LNMC professional staff. The full course curriculum and package is available at MRCS HR Section. The writer can deliver this course or guide local trainers on the use of this training package.

### ***Module 3: Project cycle management and Logical Framework***

This is another standard training course developed by the writer to train professional staff of MRCS and the four NMCS’s professional staff. The full course curriculum and training package is available at MRCS HR Section. The writer can deliver the course or provide guidance to local trainers on the use of this training package.

#### ***Module 4: The art of building facilitation capabilities***

This course is adapting from a Training Package of RECOFTC, Kasetsart University, Bangkok, Thailand with the courtesy of Dr. Vitoon, MRCS AIFP Programme Coordinator. RECOFTC had developed a full training package on this course and has extensive experience in running this course for different Community Forest stakeholders.

*Table 5.2: National training providers, Thailand*

<b>National training providers, Thailand</b>
College of Agriculture and Mekong Institute, Khon Kaen University
Department of Water Resources Engineering, Chulalongkorn University, Bangkok
RECOFTC, Kasetsart University, Bangkok

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## 6 Viet Nam





## 6.1 Introduction

The training needs assessment for Viet Nam was carried out in early 2003.

It covered the three levels of the national BDP organization: (i) the BDP Sub-Committee at policy and strategic level where the final decision is made; (ii) the BDP Unit and National Working Group at national planning and development level where the recommendation and alternative proposals being undertaken; and (iii) the Sub-area Working Groups at the sub-area and provincial level where all decision and plan of actions are being carried out and deployed.

## 6.2 BDP core competencies

### 6.2.1 Basics

Upon the common agreement on competency requirements for the BDP and BDP process, it is indicated that there are some basic competency, such as communication; facilitation; training capability; project design and planning; public participation; action research; and basic integrated river basin planning. Those competencies are applied in the following sectors and themes:

**Sectors:** Irrigated agriculture; watershed management; fisheries; hydropower; navigation, transport, river works; tourism and recreation (water-related); water supplies (domestic and industrial uses); and flood control and flood management.

**Cross-cutting themes:** Environment (including specific ecosystems, and their water demand); human resources development; socio-economics (including poverty reduction, and cultural gender aspects); public participation.

### 3.2. Classification of core competencies

There are five personnel groups classified according to the needs for core competencies, i.e. (i) Group 1: Policy decision makers; (ii) Group 2: Policy makers; (iii) Group 3: Project development officers; (iv) Group 4: Technical staff; and (v) Group 5: Local (LMB provincial) government authorities.

Vietnam is a developing country and is committed to the regional and global common activities. Thus, to enable human resource actively involve in the regional activities, they should be equipped with the English communication and then other laws and principles that regulate the water management and utilization in the region. In addition, the environment protection solutions, public participation, gender issues, negotiation, presentation skills are also subjective to enhance human resource's basic competencies. The core competencies will be presented for each personnel groups as follows:

#### ***Group 1: Policy decision makers***

They are all highest ranking persons who are responsible for giving the final decision to keep the balance between regional and country interest.

*a) BDP-related competencies*

- National problems: National development policies, strategies and plans concentrating on Integrated Water Resources Management; environment, and trans-boundary issues, especially in water and related resources planning and management, the necessity of national basin planning and regional linkages and relationships, the BDP framework and the basin planning process
- Regional problems: The necessity of the regional cooperation; regional development plan, cooperation and initiatives;
- International problems: International law, convention and regulation on river basin development and cooperation.

*b) Interaction-related competencies*

- Leadership, negotiation, presentation and dialogue skills;
- Public participation and stakeholder analysis.

***Group 2: Policy makers***

They should understand profoundly the important role of regional cooperation and have capacity to guide three remaining groups to carry out plan of actions and decision. Therefore, the general awareness of BDP, the availability of managerial and planning skills are core competencies required. The following contents then should be supplied:

- The necessity of national basin planning and regional linkage relationship;
- Introduction of the BDP framework; Brief basin planning process;
- Water resources planning process with new concept of sustainable conservation and management;
- Sectoral planning process with BDP prospect.
- Introduction of the tools (some models used in water and related resources planning process) and planning methods using through the BDP process.
- Some contents on the specific sectors' planning process, such as: Integrated water planning; Sectoral water using planning (includes irrigation & drainage, hydropower development, etc); Water environment planning; Mainstream cascade development planning, etc.

***Group 3: Project development officers***

Playing as the focal points of the project, they should be equipped with planning, managerial and technical skills. The foremost importance competencies required are project management, appraisal and evaluation knowledge, especially for water utilization, environmental and resettlement.

- Planning skills: Water resources planning process with new concept of sustainable conservation and management; sectoral planning process with BDP prospect; Introduction of the tools (some models using in water and related resources planning process) and planning methods using through the BDP process; some contents on the specific sectors' planning process, such as: integrated water planning; sectoral water using planning (includes irrigation and drainage, hydropower development); water environment planning; mainstream cascade development planning, etc.
- Managerial skills: Data, information and communication management; Project Management (with inter-sectoral coordinating/regional integrative arrangement skills); The BDP process management. Total water utilizing and environment management in the Basin. The planning project development management and monitoring; Regional multi-sectors dialog/communication management
- Technical subjects should include the general knowledge, such as: Data and information System; application of information technology for the new Data Sharing Protocol within the Region; and handling some software programs/models in river basin and water management

***Group 4: Technical staff***

They are working in the specific technical field to facilitate BDP project process. The core competencies should include:

- Data and information system: Data collecting, processing, synthesizing and formulating the project data system, sub-area and basin data bank.
- Information technology application for the new Data Sharing Protocol within the Region.
- Using some software programs/models in river basin and water management.
- Designing, formulating then using the tools for sector planning and sub-area planning processes in the view of over-all basin management.

***Group 5: Local (LMB provincial) government authorities***

They are involving in the sub-area planning process. They must understand general picture of BDP and combine the national interest with their own development plan, whereby their province's human resource needs some more detailed skills on implementing specific projects too.

- The necessity of National Basin Planning and Regional linkage relationship;
- Introduction of the BDP framework and approach; the basin planning process.

## 6.3 Organizational analysis

### 6.3.1 General assessment

Generally, the required competencies contents, which are main contents of the project seem to be very new for most personnel groups. In most of the line-agencies, Labor force increases quickly in terms of quantity but the quality is at low level. In the process of Agriculture and Rural modernization and industrialization, Vietnam still faces the shortage of scientific and technologic staffs, who are skillful in management of exploiting, protecting and developing the LMB resources.

#### *a) The BDP Steering Committee*

In regards to the Cooperation for Sustainable Development of the Mekong River Basin, Vietnamese Government has established BDP Steering Committee which includes of nine members, who are Senior Leaders and Persons from Ministry of Agriculture and Rural Development (MARD), Viet Nam National Mekong Committee (VNMC) and Ministry of Planning and Investment (MPI). They all obtained university degree and post graduate degree and are responsible for the final decision in light of national strategy.

Table 6.1: Agencies represented in the National BDP Steering Committee

Agency
MARD
Vietnam National Mekong Committee
Department of Hydraulic work and Irrigation management, MARD
Hydro-Meteorological Research Institute
Department of Agriculture and Rural Development; MPI
Sub-Institute for Forestry Inventory Planning; MARD
Sub-Institute for Agricultural Planning and Projection; MARD
Institute for Water Resource Planning; MARD

#### *b) VNMC Standing Office*

There are twenty one staffs working in the VNMC Standing Office. Surprisingly, all staffs here obtain university and postgraduate degree (master or undertaking doctoral research) covering wide range of field in irrigation works, agriculture, law, meteorology and hydrography. They are actually meeting the fundamental requirements of the VNMC standing office. However, they should be facilitated with knowledge and understanding about international law, convention and regulation on irrigation, water management, etc., and skills in controlling conflicts among multinational benefits and interests.

#### *c) Working Group for Sub Area 7V and 10V*

These two working groups' manpower were selected from related government authorities, local government authorities and line agencies who are responsible for implementing and coordinating specified project in Lower Mekong River Basin's provinces. They are appointed by authorized organization and have experiences in utilization water resources and related projects.

Table 6.2: Agencies represented in the Sub-area 7V Working Group

Agency	Ministry/province
Vietnam National Mekong Committee	MARD
National Institute for Agricultural Planning and Projection	MARD
Institute for Water Resources Planning	MARD
Department of Technology	Ministry of Fishery
Power Engineering Consulting Company I	Ministry of Industry
Institute of Meteo-Hydrology	Hydro Meteo- Hydrological Services
Institute of Water Resources Planning	MARD
Forestry Inventory and Planning Institute	MARD
Department of Agriculture and Rural Development	MPI
Department of Agriculture and Rural Development	Dac Lac Province
Yali Hydropower Plant	Gia Lai Province
Irrigation Section	Gia Lai Province
Dept. of Agriculture and Rural Development	Kon Tum Province

Table 6.3: Agencies represented in the Sub-area 10V Working Group

Agency	Ministry/province
Vietnam National Mekong Committee	MARD
Sub-institute for Agricultural Planning and Projections	MARD
Southern Economic Research Center	MPI
Sub-Institute for Water Resources Planning	MARD
Department of Agriculture and Rural Development	Dong Thap Province
Department of Agriculture and Rural Development	An Giang Province
Department of Agriculture and Rural Development	Tien Giang Province
Department of Water Resources and Hydraulic Work Management	MARD
Development Strategy Institute	MPI
Sub Institute for Forestry Inventory and Planning	MARD
Inland Waterway Administration	Ministry of Transportation
Department of Agriculture and Rural Development;	Can Tho Province
Department of Agriculture and Rural Development;	Ben Tre Province
Department of Agriculture and Rural Development; Tra Vinh Province	Tra Vinh Province
Department of Agriculture and Rural Development	Long An Province
Department of Agriculture and Rural Development	Vinh Long Province

### 6.3.2 Identification of competency gaps

Via strict implementation of the TNA process, some findings on the competencies gaps are briefly presented:

- Water resources utilization planning process in the integrated view;
- Water resources and related sector development planning management;
- Project and procurement management;

- English language and communicate skills;
- Data and information system assess;
- Some other specific subject/methods to be use in planning process in the Mekong basin related sectors, etc.

Meanwhile, the below knowledge is considered as supportive competencies for Vietnam:

- International water law;
- Water environmental management;
- Hydraulic utilization management;
- Corporate planning.

## 6.4 Assumptions and risks

There is a common consensus among four riparian countries that there will be no progress if each respective government leader and national Mekong committee do not have prompt and determined action and commitment to improve their human resource to meet national requirement and to fill the competencies gaps among four countries.

This action plan for training is a critical one that ensures the operational effectiveness of further objectives.

It is difficult to quantify the riskiness of this component since the investment largely comes into human resource development activities. However risks may happen when:

- Delay in process of project approval and therefore no training courses will be carried out on due time;
- Staff turnover after training.

## 6.5 Training strategies and programme outlines

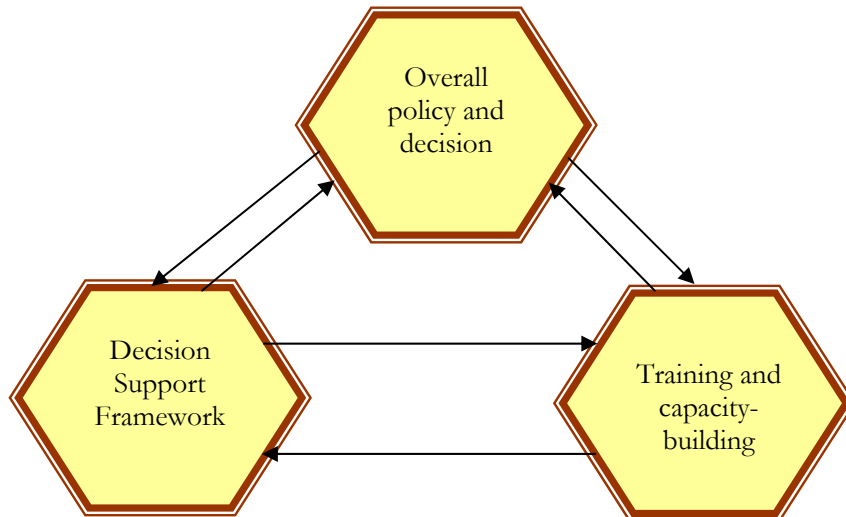
### 6.5.1 Training strategies

A training strategy is to provide all training and development necessary to achieve high performance of VNMC, and to enable it to meet the common agreement and changes in internal and external environments. The training and development also act as a motivator and resource for the human resource competency gaps, thus help human resource achieve full potential competency in their working life. Accordingly, relevant identified human resource will be encouraged to undertake suitable additional courses of study, in order to ensure their continuing professional development.

A crucial feature of this strategy is to develop the leadership abilities of policy decision makers and policy makers, to develop pragmatic capabilities of project development officers, technical staffs and local government authorities. Through allowing them to participate in formal training courses and to obtain wider experience that leading to enhance the motivation and commitment to successful result.

As far as the core programs for implementation of the Mekong Agreement 1995 are concerned, the training strategy will concentrate on the comprehensive cycle of the implementation.

Figure 6.1: Human resource training cycle



**Overall policy and decision:** In view of the importance of human resource management, VNMC must have a robust planning and control system, which should integrate with overall development planning, and have a capacity to address longer term issues for core programs;

**Decision Support Framework:** Based on the determined short-term and long term plans with directive orientation, the human resource within decision support framework will be responsible for running different models and consulting the result of alternative options and scenarios;

**Senior experts:** Among alternative scenarios, those experts will present their own professional recommendation for the most feasible scenario or option. Basing on their recommendation, the policy decision makers and policy makers will have final decision.

Obviously, the training strategy should be flexible and training activities should be refreshed regularly.

## 6.5.2 Potential training service providers

### **Selection criteria**

To undertake the very important task of improving human resource competencies, VNMC plays active role in cooperation and coordinating with other riparian countries in general, and in accelerating the whole common activities of Vietnamese authorized agencies to achieve expected output set by MRC and Vietnamese government as well. The paper, therefore, try

to present the findings of potential training service providers who are most suitable and experienced for above mention competencies. The major four criteria are described below:

**Criterion 1:** General experiences of the providers related to the VNMC's requirement. International experience and specially experience in doing similar training courses for developing countries are highly appreciated;

**Criterion 2:** Qualifications and competencies of key staffs and trainers. Those providers that have experienced trainers could be highly ranked. They should be familiar for long with traditional teaching style of classroom lecture combining with modern teaching style of role play, teamwork and case study;

**Criterion 3:** Suitability of the transfer of knowledge. The reputable and well-known providers and their experienced trainers do not bring any meanings if they are not willing to apply scientific methodology and design tailored made training course;

**Criterion 4:** Training facility. The minimum requirement for any provider is to ensure the availability of comfortable training equipment, classrooms and related facilities. This last criterion is easily met by Potential Training Service Providers being introduced at the time being.

### ***Examples of training service providers***

Examples of training service providers are listed in the following table.

*Table 6.4: National training providers, Viet Nam*

National training providers, Viet Nam
Hanoi Water Resources University
The Navigation Transportation University, Hanoi
National Economics University, Hanoi
Hanoi Foreign Language College
Hanoi Law University
Asian Institute of Technology - Vietnam, Hanoi
Agricultural University No. 1, Hanoi
Hochiminh Agricultural and Forestry University, HCMC
Cantho University
Nhatrang Fishery University, Nhatrang city, Khanh Hoa province



## 6.6 Indicative training modules

### ***Module 1: Developing a strategic planning***

The objective of the training course is to equip VNMC with ability to produce long-list term Strategic Plans, in which the planning of comprehensive sector programs, such as fisheries; Agriculture, Irrigation and Forestry; Water Resources; Navigation; and Tourism will be suitably integrated.

### ***Module 2: Project identification and management***

Project identification and management includes definition, planning and subsequent management, control and conclusion of a project. It is a methodology and a discipline which can bring significant benefits to VNMC by:

- Ensuring the minimum and limited resources are used on the right projects
- Harnessing energy of staff in achieving maximum benefits
- Managing complex changes in a systematic way
- Assessing risks, defining goals and key success areas, setting quality objectives and delivery a final product.

The purpose of this training activity is to provide a strategy for Project identification and Management implementation within VNMC and to adopt a standard methodology by which all projects undertaken within VNMC will be managed and assessed.

### ***Module 3: Training the trainer***

The purpose of the training is to train selected trainers to the level of ability that will enable them to effectively transfer to others the knowledge and skills required to ensure improved performance upon document preparations; workshops, seminars, forum and conference handling.

### ***Module 4: Environment management***

The need for formal training in environmental management is based on the important role of environment impact to any new projects/programs nowadays.

### ***Module 5: IT training***

Information technology training in VNMC and related human resource groups should be dictated by

- The overall strategy and approach to IT within VNMC and its subsidiaries
- The specific computer systems in use
- A consensus that the level of skill in the use of IT is currently below what is required to optimize performance.

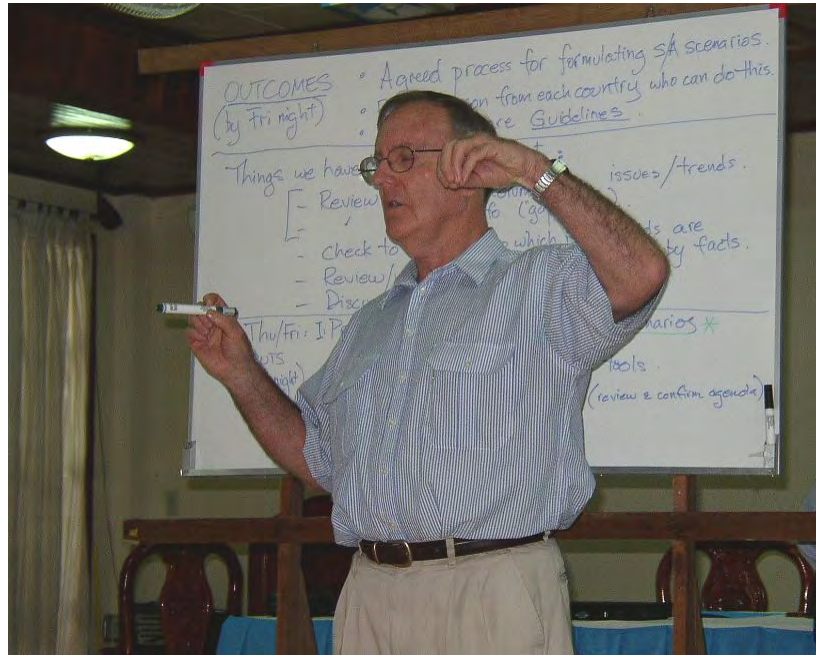
### ***Module 6: Conflict resolution, problem solving and communicating difficult***

*information*

Due to the fact that VNMC is only one among four Mekong River Basin NMC, it is needed to improve the skill of conflict resolution and problem solving to balance the interest among country to country and province to province.

*Module 7: Negotiation and presentation skills*

There is widespread consensus on the urgent need to address the training and development needs of all personnel group who are directly involving in the Lower Mekong Basin Projects. This arises because of the scale of change both in the regional and national. They will need to develop a sound understanding of these changes, their underlying dynamics and will need to develop new skills and competencies so that they can adapt to the new requirements and provide appropriate and visionary leadership and persuasion to the VNMC and counterparts in other riparian countries.



## 7 The MDABC Training Programme



## 7.1 Introduction

The MDBC Training Programme was targeted to the needs of the BDP. It was carried out under the Murray-Darling Basin Commission and Mekong River Commission Strategic Liaison Programme with AusAid funding.

Detailed documentation of the training is available and has been broadly disseminated with the *'BDP Archive'* CD.

## 7.2 Overview of training modules

The training programme was delivered by the Murray-Darling Basin Commission and the MRC Secretariat during 2003 and 2004, and it consisted of the following four modules:

Module 1 – Introduction to basin planning

Module 2 – Application of basin planning principles

Module 3 – Scenario-based planning for the Mekong Basin

Module 4 – Study tours of Lower Mekong Basin and the Great Lake of Tonle Sap

### 7.2.1 Module 1 – Introduction to basin planning

This module was held in Can Tho on 20-23 January 2003. It covered

- Introduction to the LMB
- History of the Mekong cooperation
- Key elements of integrated catchment management
- Refining objectives and developing scenarios
- The art of scenario evaluation

### 7.2.2 Module 2 – Basin planning principles

This module was held in Phnom Penh on 19-22 May 2003. It covered

- Identification of project benefits and impacts
- Basin planning principles
- Scenario-based planning
- Stakeholder involvement in the BDP
- Knowledge base and DSF software
- Using the DSF to assess scenarios
- Status of aquatic biodiversity in the Mekong
- Flow management

- Planning with floods in the LMB

### 7.2.3 Module 3 – Scenario-based planning

This module was held in Napakuang, Lao PDR, on 8-11 December 2003. It covered

- Basin development strategy formulation
- Scenario formulation
- Indicators for scenario assessment
- Social aspects of the LMB
- Hydrology terms and models
- The MRC Interactive Atlas
- Using the DSF

Furthermore, a scenario analysis for Sub-area 4L was carried out as a pilot activity

### 7.2.4 Module 4 - study tours

The study tours took place on 2-11 May 2004 (the Lower Mekong Basin) and 13-15 December 2004 (the Great Lake of Tonle Sap).

The training objectives of the study tours were for participants to understand:

- The link between communities and the Mekong River including:
- the importance of the river to people;
- how people make use of the river and related resources;
- how aspects of water availability and quality affect the ways in which people can make use of the river; and
- the planning dimension of river development including issues such as decision-making processes, stakeholder involvement and conflicts of interest.

The study tours included visits to:

- Luang Prabang and Vientiane Province, Lao PDR
- Ubon Ratchathani Province, Thailand
- Kandal Province, Cambodia
- An Giang Province, Viet Nam
- The Great Lake of Tonle Sap, Cambodia

A note from the study tours is attached as Annex 1.

## 7.3 Training package: Integrated river basin planning

A training package on *'Integrated river basin planning'* was developed in 2005 on the basis of the MDBC Training Programme. The work was done by MDBC and the MRC BDP team with support from AusAid under Phase 2 of the MDBC-MRC Strategic Liaison Programme.

A pilot implementation took place at MRCS in Vientiane in November 2005.

The package covers 2 levels of training:

*Level 1* (1 day) is intended for high level policy makers with short time available - such as BDP sub-committee members, river basin organization chairs, provincial governors and deputies. It aims to provide *'know-why'* related to river basin planning in general; the Mekong Basin in particular; and the role of MRC

*Level 2* (5-7 days) is intended for planners and managers from government agencies, river basin organizations, non-government organizations, university students, MRC professional staff and junior riparian staff. It aims to provide *'know-why'* and *'know-how'* related to river basin planning in general; the Mekong Basin in particular; and the role of MRC. In parallel, general application skills will be developed, like communication, facilitation and information analysis

Level 2 has the following modules:

0 - Introduction

1 - The importance of basin planning to the sustainable development of the Mekong Basin

2 - Major basin planning issues in the Mekong River Basin

3 - Principles and practices of good basin planning

4 - Applying the principles and practices in the Mekong Basin

5 - The role of basin planners

6 - Overview of the role of MRC

7 - Elaboration of the role of MRC and some of the tools which can assist basin planners

The documentation comprises (i) a training manual; and (ii) guidelines, OHs, and handouts for each module

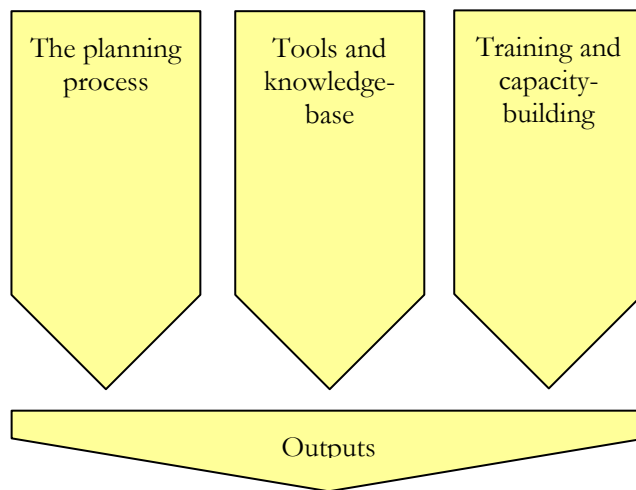
Further development of the training package may comprise translation/ re-engineering in the national languages of the member countries

## 8 Issues and priorities

During BDP Phase 1, training and capacity-building were given high priority, and are regarded as successful, but remain a high priority also for BDP Phase 2.

In general the BDP process proceeds along 3 tracks: (1) The further development and consolidation of the planning process; (2) tools and knowledge base; and (3) national and regional capacity-building. It is believed that these tracks form an entity, and that progress is inter-related.

*Figure 8.1: The inter-related BDP processes*



While the training during Phase 1 is regarded as successful, there is always a scope for improvement - things well done can often be done even better. Examples are:

- More comprehensive use of national languages, particularly at sub-area level;
- More comprehensive documentation - manuals, guidelines, lecture notes, and overheads - in national languages as far as practical, and broadly disseminated;
- Better coordination with related training efforts under other MRC programmes and outside MRC;
- Orientation towards new training needs, such as for example imposed by the emerging river basin organizations/river basin committees;
- Expansion of the training capacity by increased emphasis to training of trainers;
- Maintenance of the training needs assessments (the needs are likely to change over time), and introduction of training impact monitoring and impact assessment;
- Implementation of quality assurance routines within the training activities.



## 9 Solutions

By late 2005, BDP Phase 2 is in an advanced state of preparation.

It is anticipated that the training activities in phase 1 will be carried forward as an important part of the Phase 2 activities, continuously and dynamically adapted to new requirements and new opportunities.

In particular, the many close interfaces and overlaps between the training needs of each MRC programme can be better managed under the MRC Capacity-building Programme. A thorough coordination was not achieved during Phase 1, because this programme was temporarily discontinued.

## 10 Findings and recommendations/ lessons learnt

Findings may be summarized as follows:

- The Phase 1 training was useful in relation to the requirements of the BDP, as well as serving important needs of the participating individuals and agencies;
- There is a scope for continuation, consolidation and expansion;
- There is a scope for improved coordination, quality assurance, monitoring and documentation.

## 11 Relevance

### 11.1 Relevance for NMCs and/or line agencies

The training is regarded as highly relevant for the national participants, both in relation to the requirements of the BDP itself, but also, in many cases, for other purposes.

The identified priority subjects are only to a small extent confined to BDP-specific applications. On the contrary, most of the training will be of a more general value:

Process-related training:	<ul style="list-style-type: none"> <li>Communication, negotiation and presentation skills</li> <li>Workshop management</li> <li>Facilitation, conflict prevention and conflict resolution</li> <li>Action research and participatory survey techniques</li> <li>Stakeholder analysis and public participation</li> </ul>
Technical issues:	<ul style="list-style-type: none"> <li>Strategic planning and management</li> <li>IWRM and Integrated River Basin Planning</li> <li>Information analysis and sector review</li> <li>Decision-support tools (including the DSF)</li> <li>Transboundary issues &amp; cause-effect analysis</li> <li>Project identification and formulation</li> <li>Project cycle management and Logical Framework</li> <li>Environment management</li> <li>IT training</li> </ul>

The priority subjects are time-dependent and context-dependent and are likely to evolve in the time to come.

## 11.2 Relevance for MRCS and/or BDP Phase 2

The training has been relevant to MRCS and the BDP in several ways.

First, the training was not only extended to external participants. In many cases, MRCS staff and BDP team members participated along with colleagues from the national BDP bodies and line agencies. Second, even when MRCS staff and BDP team members participated as trainers, the teaching and learning was always an interactive process, the teachers learning and the trainees teaching the teachers and each other. Last, but perhaps most important, is the benefits to the BDP process by well qualified participants, using shared concepts and shared terminology, and with a shared sense of direction.

## 12 Concluding general outlook

Continued training will contribute to well-informed, timely and appropriate analyses and decisions at all stages of the BDP planning process, hereby facilitating the process and its identification and promotion of useful water-related development initiatives. This will, in turn, support the MRC vision of *'an economically prosperous, socially just and environmentally sound Mekong River Basin'*.

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# Annex 1:

## Proceedings of the study tours

### A1.1 Luang Prabang and Vientiane Province, Lao PDR

The group traveled on the main stream of the Mekong, upstream from Luang Prabang for approximately 25 km. The upland provinces of Laos are sparsely populated by Mekong Basin standards (around 18 persons<sup>1</sup> per km<sup>2</sup> compared to 75-175 persons per km<sup>2</sup> in northern Thailand and the southern plains around the Mekong and Bassac rivers in Cambodia). There was, however, considerable human use of the river evident during the trip.



The river is used for transportation, although because of low water levels in the dry season (6-7m) only boats with shallower drafts can navigate. During the wet season, water levels rise to around 15m. People and goods are transported along the river, including agricultural produce harvested inland such as paper bark. The tributaries are also important transportation routes, particularly because of limited road access in the area. The rock islands in the river are a hazard to navigation and limit river traffic to the daytime only. There are markers on some of the islands (an earlier MRC project) but these have no lights and during the wet season are covered with water. Local boat drivers know the river and claim the rock islands are not a danger to them.

The capture fishery is an important source of food in the main stream as well as in the tributaries. It is still possible to catch a number of species in Laos that are no longer found anywhere else in the Mekong Basin. Along the mainstream fishing is done close to the banks and the many rock islands; these places are protected from the current.

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<sup>1</sup> This is the average population density for the whole of sub-area 1L. Highest density is around Luang Prabang with 25 people per km<sup>2</sup>, and the lowest is in Phongsali with 11 people per km<sup>2</sup>.

The river is an impressive tourist resource, with many small boats taking tourists to visit handicraft villages along the bank thus making tourism an important source of income. There are also important cultural sites along the river, particularly the Pak Ou caves within the steep limestone cliffs. These caves were originally linked with river spirits and are now important Buddhist temples. A potential threat to tourism in the region is the smoke caused by shifting cultivation. Each year, aircraft are prevented from landing at Luang Prabang as a result of the thick smoke.

The river floodplain is very narrow and in some cases non-existent, providing limited opportunities for growing crops. People tend to grow small scale garden crops on the river floodplain.



### ***Nam Dong Hydro-Project and the Xiang Muak Village***

The Nam Dong Hydro project is located 16 kilometres to the south-east of Luang Prabang. The run-of-river hydro scheme was built in 1971 originally to provide electricity to Luang Prabang. Today most of Luang Prabang's electricity is supplied by Nam Ngum with only one-third is supplied by Nam Dong. The dam is maintained by Electricité du Lao (EdL). The capacity/output of the hydro station is 1 MW. It was noted that the rate of deforestation for fuelwood had decreased since the village had obtained an electricity supply.

Agriculture is an important activity in the area, with around 84% of the total land area devoted to cropping. Most farmers are engaged in fruit cropping (pineapples and groundnuts) as the income is generally higher than can be obtained from rice cropping. The Nam Dong Weir provides irrigation for 7 hectares of dry season rice (37 hectares of land are planted with rice). The irrigated dry season rice harvest is around 2 tonnes per hectare per year.

The weir has had an impact on the fisheries by stopping fish migration

The rivers in Lao pick up considerable sediment in the low hills and through the narrow floodplains and the area behind the Nam Dong weir is manually dredged each year to remove the sediment, which is then used locally.

The nearby village of Xiang Muak is home to approximately 130 families of which around half grow lowland rice and the rest grew non-rice crops (groundnuts, pineapples). The non-rice crops are grown in the upland areas but soil conservation techniques (terracing) were not in evidence on the steeper slopes. Land allocation for the upland areas is largely in the hands of the villagers. Whilst there are government controls, there is relatively little policing of those controls. Whilst there is a strong government policy to stop shifting upland rice growing, farmers are switching from growing upland rice to non-rice crops mainly because the returns are better.



Watershed management is based on forestry law and there are 1-2 people from the village responsible for monitoring and control. It was not possible to find out about the effectiveness of these operations.

There seemed to be some potential for improving upland farming practices changing farm layout and putting certain plants in certain places to reduce erosion.

### ***Houy Si Irrigation Project on the Nam Pa River and Ban Tha Baen***

In 2003, a series of three weirs have been built upstream on the Si Pa River using Asian Development Bank (ADB) loan funds (US\$ 180,000 from the ADB, US\$ 290,000 from the Lao Government and US\$ 76,000 from the local farmers). The main benefits from the scheme are small-scale hydropower production and the storage of water for tourism activity. It has been set up as a Build-Operate-Transfer (BOT) scheme in that once the local communities demonstrate their capacity to successfully operate and maintain the scheme, the Government will transfer ownership to the village.

The top weir was originally used to divert water for irrigation but this stopped the flow over the Kuang Si waterfall, an important tourist attraction. Pressure was applied to stop the diversion.. The bottom two weirs divert water for 4 villages (229 households), providing supplementary irrigation in the wet season of 570 ha (mostly rice) and 150 ha of irrigation (80% rice) in the dry season.

There is a water user group and members contribute 20kg of paddy per hectare per year, 50% of which is “payment” for maintenance of the canals. Yields are about 3 tonnes/hectare. It is anticipated by officials that future members contributions will be around 200kg of paddy/hectare.

A couple of households run small power generators using the water flow, the cost of a generator is around US\$15 and enough power can be generated to run a television.

Tha Baen Village, located 13km southeast of Luang Prabang, is one of the four villages served by the irrigation scheme. There are 90 households (432 people) in the village. Families grow rice (47ha) in the irrigated lowlands. Shifting upland rice cultivation has reportedly been eliminated with families now growing fruit trees, sesame, groundnuts and teak trees (17ha).



The success of the slash-and-burn elimination programme implemented between 1998 and 2002 has been attributed to:

Higher profits on upland fruit production over rice production; and

The efforts of government officials to stop upland rice cultivation

There are also a number of fish ponds (77 ponds over a 70ha area) stocked with tilapia, catering for both local and tourist demand. Some families also raise livestock (cattle, buffalo and pigs).

Tourism associated with the falls (and including handicrafts) provides the main cash income but this income is also highly variable and is therefore supplemented with income from teak, crops and livestock production. There are large areas mainly near the roads planted to teak trees; this is a relatively easy way to make money as the buyer harvests the trees.

### ***Lower Nam Pa Irrigation and Hydropower Scheme and Kok Van Village***

Water is also diverted further downstream on the Nam Pa River using an irrigation project funded by the European Union. The irrigable area is 120 hectares involving 145 families in 5 villages one of which is Kok Van. The hydro scheme has a capacity of 30 kW and provides electricity to 130 families. The irrigation off-take takes 2 m<sup>3</sup>/sec which is less than the minimum dry season flow (although the dry season flow is not known). There is a water

user group and members currently pay 20kg of paddy/ha/season; it is anticipated that this will increase.

The villagers of Kok Van Village listed the impacts of the irrigation scheme as follows:

- Facilitates the production of two rice crops per season as well as vegetable gardening;
- Provides electricity which also helps with small handicraft production
- The small reservoir allows for fish production
- The weir sometimes blocks Mekong fish migration

Kok Van Village is located 30 km north of Luang Prabang. The village has 132 families (population of 750) of which 2/3 are involved in lowland rice farming (64ha) and 1/3 are upland farmers. The wet season rice crop gets supplementary irrigation, and yields 3-3.5 tonnes/ha/year. The dry season irrigated rice crop area is 8 ha and produces a yield of 1 - 2 tonnes/ha/year. Farmers reported that dry season yields were higher when they first began dry season irrigated rice three years ago because they used fertilisers but they have since stopped. It was unclear as to whether farmers were using the same variety of rice both wet and dry season (typical wet season rice varieties are not well suited to dry season irrigation) or whether improved varieties were being used (which need to be fertilised to get higher yields).



Around 100 ha of upland rice is grown with yields of 1-1.5 tonnes/ha/year. Other upland crops include teak trees (53ha), bananas (3.6ha), sesame (15ha) and trees for chopsticks (22ha). Teak production provides a reliable and high income (US\$150 per m<sup>3</sup> with yields of around 300 m<sup>3</sup>/hectare) as demand from Luang Prabang is high and exceeds the available supply. The villagers said that they did not understand the technical benefits (e.g. watershed protection) of forest cover but planted because of the potential future revenues and the tax incentives they receive from government.

There are 15 fish ponds that provide for village demands only.

It was reported that almost 20% (25 families) of the households within the village are food deficient

Villages are very concerned about their water supply. They currently have to cart it from the village or collect it directly from Nam Pa River and they are also unhappy with the quality -



the water is very turbid and villagers feel that the upstream villagers pollute the water by bathing and washing in it. They can also draw groundwater from wells and ponds but these often dry up during the dry season.

### *Implications for basin planning*

The Lao highlands are a main source of freshwater for the Mekong River. The local demand for water (through domestic demand, hydropower and irrigation diversions) is relatively small, so development in the Lao highlands may have little impact on how much water flows in to the Mekong River.

Changes in land use in the catchment may have greater impacts on the water that flows into the Mekong River by increasing sediment. This will also affect the long term sustainability of upland agriculture by removing soil. The pressure on the catchment will increase – populations are increasing rapidly and there is little land available for irrigation.

There might be potential for improving catchment management through better erosion control methods in upland farming and increasing irrigated agricultural yields (to take the pressure off the uplands). Because people have very little cash income, plans to control erosion and increase yields cannot rely on purchased inputs.

The capture fishery is an important source of protein even in upland areas. Building weirs across the tributaries will affect the capture fishery as will changes in sediment load. There might be potential for improving aquaculture but people have very little cash income so any aquaculture cannot rely on purchased inputs.



### *Thangon Development Project*

The Thangon Development Project is located 7 km from Vientiane and pumps water from the Nam Ngum River (4 pumps with a total capacity of around 3m<sup>3</sup>/second). Nam Ngum flow is 340 m<sup>3</sup>/sec. 4,600 people in 3 villages get domestic water from the scheme and 1,565 farmers draw irrigation water. At the commencement of the project (in 1993) 132 ha were irrigated in the dry season with a yield of 2.8 tonne/ha. This has increased to around 1,000 hectares yielding 4.6 tonnes/ha. The rise in productivity has been attributed not only to the irrigation system but also to improved cultivation techniques and the use of fertilizers.

The area of irrigated rice has declined in recent years due to urbanisation and switching to fish ponds and vegetable growing.



All dry season irrigated rice is improved variety rice; it needs fertiliser (250kg/ha) because of the low pH. There are water user groups and members pay 190kg of paddy/ha/season to the Provincial Agriculture and Fisheries Department who now runs the project. Collection efficiency is only 50% with the rest of the service fee subsidised by the government.

Dry season irrigated rice requires fertiliser (which is imported from Thailand and costs US\$30/50kg) and the buying of seed. Allowing for machinery and labour the cost of production per hectare is 3.3 million kip and at 4 tonnes per ha farmers can earn 4.0 million kip, this is only a return to land and capital of 15%. If yields fall below 4 tonnes/ha, earnings fall.

### ***Vientiane Urban Improvement Project***

This is a DANIDA supported project involving extension of the combined drainage / sewerage system and re-development of the Thaluang swamp. The Thaluang swamp was the home to 800 low-income families, some of whom had been there since before 1975. Their main source of income was from the morning market.



Families were paid compensation to allow them to resettle (amounts were in accordance with government regulations) and a resettlement area was established about 11km from Vientiane. The swamp has been partially filled and there are plans to turn the area into a park. The

remaining wetland area receives wastewater from the combined stormwater/sewerage system.

### ***Beer Lao Company***

The brewery consumes around 1,800 kilolitres per day which it gets from a groundwater pump on the property. Some 380 kilolitres goes into actual beer making. The rest is used for washing and rinsing. The company considers the groundwater to be sufficient to meet their needs. Wastewater is given primary treatment before being discharged into a holding pond and then into a canal which flows to the Mekong. Biological oxygen demand (BOD) in the pond is 90mg/l. Sludge from the wastewater treatment process is used as fertiliser.



### ***Implications for basin planning***

The Central Lao area (around Vientiane) is growing rapidly. The urban area is expanding along the floodplain. This may have implications for future flooding.

Groundwater is important for domestic and manufacturing use. Demand is low now but will increase in the future. There is not much known about the groundwater resource.

There is greater potential for irrigation than in the highland areas but the success of irrigation depends on gaining high yields which in turn depends on high input costs. If the emphasis stays on low yields this will mean greater changes to land cover as the area to agriculture increases. This will tend to occur on the floodplain and will mean the removal of floodplain vegetation which will have an impact on the fishery resource.

There might be potential for increasing irrigated agricultural yields (to take the pressure off the floodplain). Because people have very little cash income, plans to control erosion and increase yields cannot rely on purchased inputs.

The capture fishery is an important source of protein. Changes to the floodplain will affect the capture fishery as will changes in sediment load due to erosion in the highlands. There might be potential for improving aquaculture, to take the pressure off the capture fishery, but people have very little cash income so any aquaculture cannot rely on purchased inputs.

## A1.2 Isan - Ubon Ratchathani Province, Thailand

### *Pak Mun Dam*

Thailand's Northeast is the most populous region of the country; together with the parts of the North region in the LMB, it is home to 37% of the Thai population. Ubon Ratchathani Province has a population of 1.6 million and a population density of 107 people per km<sup>2</sup>.

One of the largest features in the area, is the Pak Mun Dam. The Pak Mun Dam is built on the Mun River, 5.5km upstream from its confluence with the Mekong. The dam has a maximum height of 17m and total length of 300m. The reservoir has a surface area of 60 square km at normal high water level of 108 metres above the mean sea level (MSL) and a capacity of 225 million cubic metres. The Electricity Generating Authority of Thailand (EGAT) built and operates the dam as a run-of-the-river hydropower plant. Its operating rules are designed to ensure that the water level does not rise above 106m MSL during the dry season, from January to May and retains a maximum level of 108m MSL for the rest of the year.



### *Fishing communities around Pak Mun Dam*

Aquaculture in Northeast Thailand has grown significantly over the last decade and contributes over 33,500 tonnes per year. These statistics underestimate total production since small-scale producers are not included. Small-scale operations are estimated to produce over 30,000 tonnes per year, giving a conservative estimate of total annual aquaculture production around 65,000 tonnes.

Small-scale aquaculture contributes to food supply in areas where wild fish are not available and in seasons when wild fish are in short supply. It provides opportunities for flexible supplementary income and helps families diversify from fishing and rice farming activities.

Villagers near the river both up and down stream of the dam rely on both farming and fishing. The land area they own is small and so fishing is an important source of food and income. Since the construction of the dam the fish capture has declined. Villagers also collected food (vegetables, bamboo shoots) from the banks of the rivers which have now been flooded upstream of the dam. The Mun River is an important fish migration route and has cultural significance for the communities living along it.



Villagers now have to find new ways to earn an income in order to buy food they can no longer catch this has meant travel from the village (often as far as Bangkok) to find cash-based employment and has been very disruptive to family life. Many families are also incurring increasing debts as they need to borrow money to buy food.

Communities have also been split physically, with some people re-settling in different locations to others and with people being moved further from their schools and temples. The cultural links the people have with the river, through festivals and meeting places have been affected by the dam. Villagers feel that they can no longer understand the river - there

is either too much water or not enough. Water quality is not as good as the rapids that used to “cleanse” the stagnant water from upstream are now submerged.

Villagers commented that they were not anti-development but were not happy with the lack of consultation and mis-information around Pak Mun Dam which led to unanticipated and unacceptable impacts. The impact upon capture fisheries downstream has been particularly severe. Before the dam was constructed, fish used to migrate upstream during the rainy season. The Mekong used to back up (reverse flow) into the Mun River for around 30km, assisting with fish migration. Because this reverse flow is now impeded, the number of fish able to migrate upstream has declined and there is also less food for them to eat along the inundated banks. The fish ladder has not been successful.

In 2003 the dam gates were opened during the wet season after considerable lobbying. This allowed fish to swim up to their spawning grounds and the re-instatement of the spawning grounds which were previously flooded. Villagers say the improvement in fish catch happened very quickly.

A committee was set up to investigate the impacts of the dam and to provide recommendations on mitigation measures. The Committee recommended that the gates should be opened for a full 5 years to restore the ecosystem. The government rejected the findings saying that four months of opening (between July and October) per year is sufficient. However villagers are still unhappy as they say that the fish begin migrating in May and come back in September which means that the gate-opening period is not appropriate for fish migration. July-October opening is, however, the best time for them to be open to protect the urban centre of Ubon Ratchathani from flooding. As a form of compensation, the government provides fingerlings to be raised in pond fisheries, which it then buys back for release into the river. This has only limited benefits to capture fisheries communities.

Other changes that may have been the result of the dam are an increase in weeds and bank erosion on the Lao side of the Mekong across from the mouth of the Pak Mun.

Indications are that the dam is not operating to full hydro capacity (see World Commission on Dams Report) and that Egat could supply electricity from other sources to replace Pak Mun. Local villagers are not receiving electricity from the scheme but power prices have increased significantly.

Indications are that Thai Government policy is now to promote the irrigation benefits of the dam.

### ***Pak Mun Irrigation - Ban Sapaeu***

Water is pumped from the Mun River using 5 pumps (with a capacity of 150 horsepower each) and then is distributed through concrete lined channels. Pumping costs are 75 baht/hour. Dry season crops include watermelon and chilies. There is no dry season rice grown as the upfront capital is too much in terms of the water fee. Rice is grown in the wet season and irrigation is used to grow "early" rice that has to be irrigated before the start of the wet season.

The water user group has 600 members with only 25% actually farming during the dry season. The major membership benefit is access to fertilizer and there is insufficient water from the pumps to support all members anyway. Many of the members let their land to “outsiders” who come in to farm.

The irrigation project was built 20 years ago and responsibility to maintain has now been transferred to the tambon. The 75 baht/hour fee (for members) covers electricity, staff and canal maintenance and also returns a surplus (sometimes in excess of 1,000 baht) to the members.

Could irrigate more but both the pumps and the canal system are limited.

The Pak Mun dam has meant higher water levels in the river and hence lower pumping costs for the irrigation system. As most of the pumping takes place in the dry season, opening the gates in the wet should not make any difference to cost.

### *University of Ubon Ratchartarni - Faculty of Liberal Arts*

The University is in the process of establishing a Mekong Sub-Region Social Research Center (MSSRC), which will function as a focus for the investigation of issues associated with the area, and for the exchange of information with other institutions. Current areas of research include the socio-economic impacts of Pak Mun Dam and governance issues in the Mekong River. Another part of the Center's work will be to facilitate public access to information about the Sub-Region. This will involve collating and translating relevant local materials into English which will then be published on the university's website. Chief among the materials to be held at the resources centre (which will use the web as a way of making information accessible) will be 10 years of media reports on Pak Mun Dam. The University is also part of a network of regional universities developing a curriculum for the Mekong Region.

The unit is planning to hold an international conference on Transborder Issues in GMS Development in February 2005.

### *Aquaculture community - Ban Boong Mai*

This community (of 140 households) is upstream of the dam and upstream of a significant natural blockage in the Mun River. 20 families in the village have fish ponds<sup>1</sup> in which they raise catfish fingerlings which people buy direct from the pond at 30 - 50 baht/kg and then sell at the market for about 100 baht/kg, although the price has been falling due to an expansion in aquaculture. The fingerlings were sourced from Nahkon Sawan but the company has now set up a local fingerling raising operation. Each family has about 1 rai and the farmer interviewed said his income per year is around 300,000 baht with costs of around 80,000 - 90,000 baht/annum. Fish food is the highest cost they buy ready-made fish food and fish meal (ground up chicken) from the market. They also make their own fish food. Ponds are drained annually and coated with lime. One pond can be used again and again. Wastewater from the ponds is discharged directly to the river and the farmers have received complaints about this.

Farmers prefer to raise catfish rather than tilapia. Tilapia takes more effort to feed; it can take half a day to feed them as the food needs to be placed quite close to them. Losses are also higher with tilapia. The villagers are considering setting up a processing facility as they are currently producing large quantities of fish that they have to sell at low prices because of increasing competition from other villagers. If they can add value in the village, then they may be able to command higher prices in the market.

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<sup>1</sup> Only 20 families have ponds because the capital input is high and they require land close to the river.

The farmers raised fish before the dam and consider that the dam has resulted in there being higher floods which wash away fishing gear and fish. Given that there is a natural blockage between them and the dam, the increased flooding may be because of increased rain in the upper catchment. The water also rises much quicker now than it did before. Villagers consider the water to be more turbid after the dam than before.



#### ***Pak Mun Fisheries Office and local village heads***

The Fisheries office has 14 staff and is responsible for monitoring and enforcing fishing regulations across three Provinces containing a total of 13 water bodies. All fishing except "family fishing - small gear" is banned from 16 May to 15 Sept each year. As there are few staff they put their efforts into monitoring particular fish breeding areas. There is a prohibition of destructive fishing which includes the use of poison, electricity and large nets across the river. Fish migrate when the river is in flood and this is the time when it is most difficult to fish with large illegal gear. They have identified fisheries conservation zones in association with the local tambon councils. Community-Based Fisheries Management (CBFM) is being introduced so that each village will have a fish sanctuary where fish can reproduce.

They also operate a shrimp and fish hatchery and release shrimp (40 million) and fish fingerlings (10 million) into Pak Mun above the dam. Villagers catch the shrimp when they are about 6 months old - they are easy to catch - and sell them for 100 baht/kg. If left to grow they turn into freshwater crayfish and sell for 400-500 baht/kg.

One of the village heads noted that fish migration in Pak Mun had two cycles - the small fish which moved up and down in May/June/July and the large fish which move during July/August/Sept. He noted that in the flood season 20 years ago the mainstream of the Mekong was full of fish and now there are far fewer and he asked the group from the MRC what had caused this.

Another village head noted that the Pak Mun dam had been beneficial because of the compensation which had been received - 90,000 baht for disruption to fishing during construction and 5,000 baht for new fishing gear.



### *Pak Mun Irrigators - Sirindhorn District*

The irrigation system is almost 25 years old (built before the dam). Water is pumped from Pak Mun (cost of 60 baht/hour for the villager who orders the water). They grow wet season rice (and use supplementary irrigation, application of fertiliser 120 kg/ha) and early rice (which requires full irrigation). In the dry season they grow non-irrigated crops - cucumbers, chilis and watermelons. Watermelon production has been increasing since the system was installed but rice production has remained stable. People have learned to grow non-irrigated dry season crops because people from outside the area come in and rented land and planted those crops. Prior to that they were fishing in the dry season. Some farmers find the crops difficult to manage because pesticides have to be used and the crop has to be tended. Watermelons use the least water but most pesticide. 30 out of 266 families in the village use irrigation water; more would use it if the system could support them.

The system is maintained using funds from the tambon council. There is widespread land clearing in the area as the demand for land increases.



### *Implications for basin planning*

The Isan Plateau is the poorest area of Thailand. Irrigation has the potential to improve livelihoods but currently successful irrigation relies on producing high yielding crops and in doing a type of agriculture that is much riskier than traditional agriculture.

The capture fishery is an important source of protein. The building of the Pak Mun dam has significantly affected the migrating capture fishery. Changes in the dam operating procedures (i.e. keeping the gates open) could reinstate the migrating capture fishery. The migrating fishery is complex with smaller species migrating first followed by larger species, the best sources of knowledge on how the fishery works has proved to be the local people.

Protecting the capture fishery is a priority for the Thai government but to date they have had very few resources available. Strengthening the effectiveness of the Thai fisheries department in their efforts to protect habitat would benefit many people of the Basin, not just the people of the Mun River.

### A1.3 The Cambodian floodplains - Kandal Province, Cambodia

The Mekong lowlands include two subcomponents: the Cambodian floodplains and the delta. Both are formed from the deposition of recent sediments over older bedrock. The floodplain shows evidence of numerous recent changes in river course and, because of the flat terrain, larger areas are submerged during the high flow period. The Tonle Sap Great Lake is the largest body of freshwater in Southeast Asia and forms one of the key features of the lowlands. During the flood season, water flows from the Mekong mainstream northwest to contribute most of the water that fills the Great Lake. As the river level falls in the dry season the flow reverses and water from the lake flows southeast to Phnom Penh, where it meets the Mekong mainstream and the Bassac at Chaktomuk junction.

The river branches at Phnom Penh, with the Bassac forming the western arm of the delta, and the Mekong proper forming the eastern arm. The delta area extends across some 65,000km<sup>2</sup>. In the upper delta, the river channels are lined by natural levees formed through silt deposition.



#### *Caged fish-raising and discussion with Cambodian fisheries officials*

There are three scales of capture fishery in Cambodia - the large scale fishing lots set up on the various lakes including Tonle Sap and dai fishery, medium-scale fishing and small-scale (family) fishing. There are three types of fish culture - caged fish raising in the river, fish raising in ponds and fish raising the rice fields. The rice fields are filled by fingerlings coming in from the Mekong river. The large scale fishing lots are government controlled and sold by tender, the rules are set out in a handbook. The officials considered that the capture fishery yield is declining and considered that this may be due to the China dams reducing the wet season flow, they considered there had been a 20-25% decline in the capture fishery yield.

There are bans on fishing (except family fishing) from 1 June – 31 October.



The officials considered that increasing sediment loads, destruction of fish habitat, increased use of modern fishing gear (particularly very fine nets which were banned but still used) and lower wet season flows were all contributing to declining fish stocks.

The caged fishery contained some 7,000 fish in an area about 9 m<sup>2</sup>.

### *Khmer village along the Mekong*

Although the villagers lived by the river they did not have sufficient funds to buy the fishing gear and boats necessary to fish in the river. Instead they rely on flooding of the wetlands and rice fields connected to the river through a natural channel which has been modified (with retaining walls) to keep the flood flow in, this flooding brings in the fish. Fish is their main source of protein. The flood this year was much lower than previous years.



They have to pump to irrigate and pay 400kg/rice per hectare plus 120 litres of fuel in pumping costs. Normal yield would be 3 tonnes/ha but this year there was not enough rice to reserve for seed - a lot got eaten by rats who were not controlled due to the lower flood. The village relies on the river for drinking water (which they boil).

### *Implications for basin planning*

People living on the Cambodian floodplains are very poor.

Whilst there is land available for irrigation, the costs of irrigation are high and the risks are high. Opportunities to exploit the capture fishery are also limited by low incomes (which mean people cannot afford boats or fishing gear).

As a result the annual flood and the size of the flood is extremely important – it brings the fish onto the floodplain, it provides water for the crops and it gets rid of the rats.

The river and Tonle Sap are important transport routes. Goods are transported without regulation and pollutants are carried across Tonle Sap (such as petrol). Any spill in Tonle Sap would have significant implications for the fishery which would have impacts beyond just those living around the lake.

#### A1.4 The Mekong Delta - An Giang Province, Viet Nam

The Mekong Delta of Vietnam extends over 12 provinces including Long An, Tien Giang, Dong Thap, Vinh Long, Tra Vinh, Can Tho, Soc Trang, Ben Tre, An Giang, Kien Giang, Bac Lieu and Ca Mau with a land of about 3.92 million ha, making up about 79 % the Mekong Delta or 5% the whole Mekong River Basin.

The population of the Mekong Delta is around 17 million comprising 13.6 million rural people and 3.08 million urban people. The population growth rate is estimated at about 2.4% per year, with a density of about 412 people/km<sup>2</sup>. The highest population density is concentrated in the provinces along the Mekong River and the Bassac River, and the lowest is located in provinces which are far from freshwater-sources like Ca Mau, Bac Lieu, Kien Giang and Long An.

In 2002, agriculture's share of the Vietnamese economy was around 23 per cent with nearly 70 per cent of the population engaged in agriculture. Agricultural production is dominated by rice, which accounts for half of agricultural production. Production methods have been intensified and rice yields are now among the highest in the region. Vietnamese farmers have also begun to diversify into other agricultural products. Perennial cash crops such as rubber, coffee, tea and fruit are grown in significant amounts. In the Mekong Delta, agricultural production accounts for about 55 per cent of the regional GDP.

##### ***People's Committee of An Giang : Provincial Agricultural and Rural Development Office in Long Xuyen***

An Giang has a population of 2.1 million which is growing at around 1.7% per annum. Main water resource issues were annual flood, acid soil and saline intrusion. There is a large network of canals (over 5,000km) begun during the French colonial era that criss-crosses the Province and provides sufficient water for 230,000 ha of irrigation. The government has moved away from advocating three rice crops per year in most areas and encourages farmers to now grow only two and avoid growing a crop during the flood season. Aquaculture is also important – catfish are raised for export to the United States.

During 2000, 90% of the land in An Giang Province was flooded with an average height of 1.5-2 m and the deepest flooded areas being 3.5 - 4.5m under water. 300 people were killed and many of these were children. The Province has been improving its drainage system (via the canals) in order to try and minimise flooding. There are also embankments being built to protect against flooding. Flood-affected homes are being relocated to higher ground as a temporary measure during the flood season.

Rice prices have been low so the Province is encouraging diversification away from rice into shrimp-raising and high value crops such as vegetables. The Province is promoting shrimp/paddy and vegetable/paddy rotations. Shrimps and vegetables are produced both for domestic and international markets, particularly Cambodia. While the area of paddy fields remains the same, the quality of the crop is increasing and it is becoming more water efficient. Peanuts and soybeans are being planted in the uplands and even though it is more expensive to pump water up to the higher ground, the returns from production justify the input expenditure.

Before the 2000 floods, the output from capture fisheries was greater than that of culture fisheries but the capture fishery is reducing due to local overfishing and reduced migration from the north. There is however now a growing reliance on culture fisheries with the output from culture fishery now exceeding that of the capture fishery.

The Province uses the MRC's 5 day forecast flood information.

### ***North Vam Nao Project***

The North Vam Nao Project (AusAID funded) is in An Giang Province between the Mekong and Bassac River. The project goal is “to assist An Giang Province establish and operate an effective water management system in North Vam Nao which is socially and environmentally sustainable and benefits the local economy by assisting in the alleviation of poverty”. This will largely be done through building a series of embankments which will isolate an area (30,000ha) of Vam Nao from flooding and allow them to do year round cropping (soy bean, baby corn) and aquaculture. The embankments consist of an outer ring dyke and a lower internal dyke with sluices on the main canals allowing water to enter during the flood season to flush the canals. The gates are only closed during large floods. The project is aimed at controlling the early flood to allow harvesting of summer-autumn crops.



The road around the island forms the levee (outer ring) and is around 3.5m above mean sea level (amsl). In the north of the island it is 5-5.5m amsl. Before the AusAid project, 8,000ha of year-round cropping had already been established. The total cropping area in An Giang is around 200,000ha (mostly 2 crops) with 25,000ha supporting 3 crops. Since most of the area is seasonally flooded, 95% of the area is planted with 2 rice crops. Flood depths are too big for fruit.

It is similar to a project already existing in South Vam Nao (Chi Moir District) which was funded by the people and the local government and has been extremely successful. The

project is working with Can Tho University to find rotations which are sustainable. Declining soil fertility is one of the main problems with year round cropping.

Once complete the natural fish stocks will no longer have access to the paddy fields during the flood season and this means a reduction in the capture fishery. Landless people relying on the capture fishery may well get work as farm labourers during the flood season (which they do in the non-flood season). The economic analysis showed that the value of production is greater when a range of different crops is grown during the wet season rather than only having no crops and relying on capture fisheries. Production per hectare per year has increased as has employment while poverty has decreased. A further advantage is that by being able to produce an early crop of rice, farmers receive a higher price (premium) as competition is much lower.

Also, once floods are controlled, it becomes more economical to have pond fisheries in rice fields. There are still some questions about the sustainability of multiple year-round cropping, with soil fertility being a particular issue.

The project also runs a number of poverty reduction projects providing small loans through the Women's Union and helping landless fishermen to do caged fish raising. Often considerable gains can be made with a very small injection of funds.

The project was referred to the MRC because it alters flood patterns. The Vietnamese VRSAP model was used. An increase on the Cambodian floodpeak of 2-3cm was forecast based on that model. The results of the referral to MRC are unknown. If Vam Nao was repeated across the delta it may well have serious consequences for flooding and for the capture fishery which relies on the flood waters taking the fingerlings into rice paddies and swamp/flooded forest areas. Officially embankments are banned in areas important for fish breeding like the Plain of Reeds, in reality there are "spontaneous" embankments being built all over the delta as well as considerable infilling using river sand dredged from rivers including the Mekong River. This dredging is uncontrolled and has resulted in bank collapse.

### *Cage culture fisheries, Chau Doc*

Vietnam has the largest aquaculture area in the basin, covering 330,000 hectares. In 1999, freshwater aquaculture production in the Mekong Delta was 171,570 tonnes, with a mean annual pond production of 4.8 tonnes per ha. The Vietnam government has also recently begun promoting giant freshwater prawn culture in the Mekong Delta. Present prawn production is about 5,000 tonnes per year, but the government has set a target of 60,000 tonnes per year by 2010.

Culture fish receive lower prices than capture fish but capture fish are preferred for drying and salting, providing them with a "store of value". There are approximately 1,000 families engaged in cage culture along the Bassac River around Chau Doc. The food for the fish is either made on the premises or is obtained from a local factory. Mineral supplements are also usually added to the food. Cage culture is an expensive business, with major inputs as follows:

- Fingerlings
- Food (4 tonnes per 150,000 fish per day when fish are at full size)
- Supplements
- Medicine

- Labour
- Machinery

Farmers rely heavily on discounts on bulk purchases of food and supplements in order to make a profit. Market prices for the fish also fluctuate regularly.



Stocking density is around 150,000 fish per m<sup>3</sup> with a survival rate during the 7 months of breeding around 80-85%. Water pollution is a recognised threat but it is not yet perceived as a problem.

### *Implications for basin planning*

The Mekong Delta is densely populated and that population will increase substantially (even though growth rates are low for the Mekong region).

Changes in land use on the floodplain (urbanisation and the move toward permanent crops rather than rice) will have implications for flooding by changing flood flows and exposing more people to flooding.

Aquaculture is very important in the delta and sustainable expansion of aquaculture will be necessary to provide protein for a growing population and to take the pressure off the capture fishery.

Sustainable expansion of aquaculture is a challenge. Aquaculture production can potentially put a lot of pollutants into waterways but there is work being done by research institutes such as in Can Tho on sustainable aquaculture/rice rotations.

## **A1.5 The Great Lake of Tonle Sap, Cambodia**

The Lake has a unique role and size. The function of the lake as flood regulator (water storage in wet season) and salinity controller (supply water in dry season).

Cambodia and Vietnam depend very directly of the Great Lake. Developments within Cambodia and in upstream countries could have major impacts on the functioning of the Great Lake.

### ***Cambodian inland fisheries: An overview***

Captured fisheries in Cambodia are divided into 3 types of fishing, namely large-scale fishing, middle-scale fishing and small-scale/or family fishing.

Large-scale fishing is organized through lots auctioned by the government. In 2003, there were 162 fishing lots, including 81 barrage lots and 60 bag-nets. The size of the Lake fishing lots are up to 500 km<sup>2</sup>, using 20 to 40 km of bamboo fences. Middle-scale fishing requires licenses from government and can be operated according to seasons (open season and closed season). Small-scale, or family fishing, is a tax-free operation for the fishery communities all year round.

FishBase 2004 has recorded 847 fish species in Cambodia, 477 of which are freshwater fish including 10 endangered species. During the migration peak in Tonle Sap River an average of 34 tons of fish are caught every hour. The productivity of the floodplain ranges between 139 to 230 kg/ ha/ year, the highest worldwide. This is due to 3 uniquely interconnected factors including high biodiversity, large accessible floodplains, and a very high exploitation rate over decades. In order to sustain fish production a coordinated effort would encompass 4 main factors such as:

- Keeping good condition of hydrology (including water level, flood duration and timing);
- Floodplain environment (including flooded vegetation);
- Fish migration passage; and
- Control of fishing activity.

A four-fold management approach may be necessary including:

- Better valuation of natural resources;
- Protection and management of wild resources (through proper hydrological regime, adequate floodplain environment, limited barrier to migration, and sustainable fishing intensity);
- Aquaculture improvement; and
- Improve policies and governance.

### ***Kampong Phlouk (fishery community)***

The Kampong Phlouk Community Fisheries (CF) village is located in Prasat Bakong district about 25 km from Chong Khneas by boat. The CF has 3 permanently settled villages. Kampong Phlouk community fisheries constitutes of 437 families with a population of about 2,767. The CF area is 14,293 hectares and is inundated 6-8 months during the rainy season. During the rainy season people live in their villages on stilt houses, but during the dry season, 60% of the families move closer to the shores of the Tonle Sap and move back when the rains come again. Kampong Phlouk has 48 hectares high-density inundated forest. The forest height is about 15 meters.





It is believed that before 1940 Kampong Phlouk was very rich in biodiversity including fish such as the Giant Cat Fish, dolphins and many other species, which are now very rare or extinct including Boas, Cobras, monkeys and big wild cats.

In 1980, many upland farmers moved to the inundated forest and cleared much of it to plant mung-beans, watermelon and pumpkins. But in 1995 the authority and the local commune tried to stop this activity to allow for forest regeneration. In 1999 with initiation from FAO and participation of local people, community fisheries were established to manage and conserve natural resources in a sustainable way.

Fishing is the most important livelihoods activity in the community fisheries with about 94% fishers (main income is from fishing). Other livelihoods activities include fish trading, middlemen, retailers, fish processors piggery, fish cage culture, vegetable growing and 6% moneylenders and mechanics.

In 2001, fishery and natural resources management in Kampong Phlouk was established for sustainable used of natural resources and poverty alleviation in the community. The Government, NGOs, UNDP, ADB and FAO are the major donors and actors.

The community has set up fishing law and regulation by the support from the government and many organizations. The fishing law and regulation sets the fishing season (closed and opened season), the fishing tools, etc. Furthermore, in order to protect and manage natural resources, the community has divided the land into two zones covering protected and conservation areas. Other communities can also catch fish in these areas, but they have to follow the fishing law and regulation established by the Kampong Phlouk community.

During the field visit, the main problems addressed include access to clean water and sanitation, access to road (A road does not exist in the wet season and only a very bad road exist in the dry season) low cost of fish catch and high expenditures on petrol.



Community fisheries management in Cambodia is at the very initial stage. The villagers, with limited funds and capacity for managing resources, operate it voluntarily. There are 39 members in the fisheries community including 7 women. Fishing rules, laws and regulations should be established and strengthened in terms of fishing rights, tools use, protection of fishing and natural resources based on a participatory approach. The community felt that protection of the flooded forest in their area is most important for sustainable fisheries management.



- There are no land titles related to the flooded forest areas. Some people see it as open access and they move in and cut the trees during the dry season for firewood and for cultivating the land.
- The average use of firewood in the village has decreased from 20 to 7 cubic meters per family per year.
- Regarding natural resources, according to the villagers, the main changes over the last 20 years are decline in flooded forest and decline in fish.

### ***Prek Toal Bird Sanctuary***

The Lake was listed as a Biosphere Reserve in October 1997 following a meeting of the International Committee for Biosphere Reserve at Paris. There are three core areas namely Prek Toal (approximately 31,282 ha) in Battambang

Province, and the other two Moat Khla-Boeng Chhmar Lake (approximately 32,969 ha) and Stoeng Sen River (6,586 ha) in Kampong Thom province which are designated in the Tonle Sap Biosphere Reserve. An area of approximately 510,768 ha surrounding the above core areas is designated buffer zone where multiple uses are allowed. A larger surrounding area of transition zone (approximately 899,600 ha) is designated in the Lake's floodplain, where National Roads 5 and 6 makes the outside boundary.

Prek Toal is located at the Southwest corner of the lake (fig. 2). Access to the area is only possible by boats that takes one hour from Chong Kneas, Siem Reap province, and 4 hours on average from Battambang provincial town via Sangke River if travel by speedboat. To travel from Chong Kneas, one has to cross the open water of the Tonle Sap Lake.

Between March and May, at minimum water level, the water retreats from the floodplain of inundated forest, leaving many small isolated deep pools of water. At this time, the marsh and swamp, which appears by the lakeshore at the fringe of flooded forest serve as feeding grounds for large colonies of waterbirds.

Since accessibility to the forest is difficult for its dense and thorny structure, mainly only areas close to waterways are under pressure of use. Due in part to the increasing demands of fuelwood for smoking small fish, native forest around the mouth of Sangke River has been recently exposed to pressure from fuelwood collection.

The area is found to accommodate large population of waterbirds ranging from the World's most endangered species to vulnerable threatened and to common species. Parr et al, (1996) identified three endangered species, Spot-billed Pelican (*Pelicanus philippensis*), Greater Adjutant (*Leptoptilus dubius*) and White-winged Duck (*Cairina scutulata*); two vulnerable threatened species, Milky Stork (*Mycteria cinerea*) and Lesser Adjutant (*Leptoptilus javanicus*); and five near-threatened species, Oriental Darter (*Anhinga melanogaster*), Painted Stork (*Mycteria leucocephala*), Asian Openbill (*Anastomas oscitans*), Black-headed Ibis (*Threskiornis melanocephalus*), and Greyheaded Fish-Eagle (*Ichthyophaga ichthyaeetus*).

### ***Old water supply system (Prasat Keo Water Gates)***

Prasat Keo is a diversion weir, constructed by the French, on the Siem Reap River, which diverts water into the Barai reservoir during the raining season.

Mount Kulen is the water source and provides a water flow through out the year.



The old water system was built with two gates, which regulate the water automatically in the raining season. According to the Deputy Director of Provincial Water Resource, during the rainy season, when the water flowing from Mount Kulen, the gates will automatically close and change the flow of water into the Barai reservoir.

### ***Rohat Teouk (water wheel)***

Rahat Teouk was established as the main water supply for the people living in the area for practicing farming in both seasons. It was the main means of water supply for irrigated agriculture not only in the Angkor area, but the same system exist up to present times. However, this Rohat Touek is just kept as a main symbol of Cambodian water irrigation systems.



### ***West Baray***

Angkor's power was based on the management of water. However, it was not simple. Over time, canals gradually silted up and sand filled the barays. During the Angkor Era, 3 main barays were established. The study tour participants visited the largest one call the West Baray

The purposes of establishing the barays by the Kings of Angkor in that era was to store the water for cultivation during the dry season and for protecting flood from Kulen Mountain during the rainy season. However, the barays were not only reservoirs; by having them built, the kings also consolidated their power. Furthermore, the barays also had religious functions.



The West Baray was built in the early 11 century. It was the third and largest one. It was 8 km long and 2.2 km wide, while the dykes were 10 to 17 m high. Historically, more than 100 km<sup>2</sup> of rice fields was irrigated thanks to this baray, supporting nearly one million people. However, despite its vast size, this reservoir also gradually silted up, and the dykes were raised to deepen the baray. Built in 1050, the Western Baray was partly restored in the early 1950s, and today it is still partially filled with water as a living memory of Angkor's Golden Age.