Draft Concept Note
Agriculture and Irrigation Programme (AIP) (2011-2015)

1. Background

1.1. Agriculture sector in the LMB

Agriculture provides livelihoods for 60 percent of the Mekong Basin’s population, with more than 20 percent of the population considered to be below the poverty line, and 15 percent in undernourishment. Demographic changes are taking place and more are expected in terms of migration away from rural areas, to the point that the area planted in the dry season in NE Thailand, for example, is limited by the availability of labour. The agriculture sector is commonly the first point of intervention in raising living standards, improving livelihoods and mitigating poverty.

<table>
<thead>
<tr>
<th></th>
<th>Cambodia</th>
<th>Lao PDR</th>
<th>Thailand</th>
<th>Viet Nam</th>
<th>Ave.</th>
</tr>
</thead>
<tbody>
<tr>
<td>GDP (Min USD)</td>
<td>5,836</td>
<td>2,362</td>
<td>157,817</td>
<td>44,835</td>
<td></td>
</tr>
<tr>
<td>Share of Agriculture sector (%)</td>
<td>31.7</td>
<td>44.8</td>
<td>10.8</td>
<td>21.1</td>
<td>13.9</td>
</tr>
<tr>
<td>Population (‘000)</td>
<td>13,957</td>
<td>5,666</td>
<td>63,004</td>
<td>85,025</td>
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<tr>
<td>Growth rate (%)</td>
<td>1.7</td>
<td>1.6</td>
<td>0.7</td>
<td>1.4</td>
<td>1.2</td>
</tr>
<tr>
<td>Growth rate in urban pop. (%)</td>
<td>3.0</td>
<td>1.8</td>
<td>0.8</td>
<td>1.7</td>
<td>1.5</td>
</tr>
<tr>
<td>Poverty (%)</td>
<td>35.0</td>
<td>33.0</td>
<td>13.6</td>
<td>28.9</td>
<td>23.8</td>
</tr>
<tr>
<td>Undernourishment (%)</td>
<td>25.0</td>
<td>19.0</td>
<td>17.0</td>
<td>13.0</td>
<td>15.7</td>
</tr>
<tr>
<td>Total Labour Force (‘000)</td>
<td>7,474</td>
<td>2,952</td>
<td>38,579</td>
<td>45,536</td>
<td></td>
</tr>
<tr>
<td>Share of Agriculture sector (%)</td>
<td>68.1</td>
<td>75.6</td>
<td>52.5</td>
<td>65.3</td>
<td>60.6</td>
</tr>
</tbody>
</table>

The natural flow regimes of the river and its tributaries result in high water levels during and after the monsoon, and low levels in the dry season. Throughout NE Thailand and Lao PDR, some form of water storage is required to allow irrigation in the dry season, and it is clear that dry season irrigation areas are substantially smaller than wet season ones, except in the Delta, where farmers may be able to harvest up to seven rice crops every two years.

Rain-fed cropping occupies the largest area and is dominated by rice culture, due to high wet season rainfall, extensive flooding and water logging of riparian soils. Although irrigation water-use accounts for more than 70 percent of current utilisation, relatively little water is diverted for agriculture in the basin, typically less than 10 percent of the total mean annual flow. Ground-water is extensive, and not greatly used, but the potential for sustainable use is uncertain in many places. There are potential problems with arsenic contamination, which have been clearly identified in the Mekong Delta and Cambodia, and are likely to be more widespread.

In general, agricultural productivity is low in the Thai, Lao and Cambodian parts of the basin,
although agriculture is extensively developed, diversified and intensive in the Mekong Delta, with significant areas of fruit trees and a substitution of rice by aquaculture. Diversification in enterprises has been plagued by extreme price volatility, exemplified in catfish aquaculture in the upper Mekong Delta, where it initially expanded as a very profitable alternative to rice cultivation. Shrimp culture in coastal production systems has experienced similar unpredictability.

Thailand and Viet Nam are the two leading rice exporters in the world. Cambodia and more recently Lao PDR have planned significant expansion in rice area to become players in the export market. The recent rise in global rice prices has strengthened this position, but longer-term patterns of rice growing and productivity will be directly determined by the evolution of world prices, and to an extent developments and reforms within rice marketing channels in individual countries.

1.2. Issues and opportunities in the agriculture sector

(1) Food security

The world’s population is projected to reach 9.1 billion by the middle of this century, 34% higher than today. Income levels will be multiples of what they are now. In order to respond to the expected demand of this larger and richer population, food production must increase by about 70% by 2050. (World Summit on Food Security 2009)

In the medium term, analysts suggest that commodity prices will not remain at the record levels observed during 2007 to 2008. However, recent OECD and FAO study has suggested that average real prices are likely to remain above those observed during last two decades. The world market price projections of the International Food Policy Research Institute (IFPRI) show that world grain prices will further increase 30-50% before 2050.

These projections imply several issues and challenges for the future agricultural development in the LMB, which include the need to increase of food production, access to food for low income people, and economic growth derived from agricultural commodities export.

(2) Climate Change impacts on agricultural production

Recent study on Climate Change predicts that temperature and wet season rainfall would increase, but dry season rainfall would decrease in LMB. Since about 80% of agricultural area in the LMB is used for rainfed rice during the rainy season, higher temperature and increased rainfall in the wet season would potentially increase its productivity, but it would also increase the flood risk. On the other hand, decrease in dry season rainfall would intensify the water stress in some areas such as NE Thailand and Tonle Sap Great Lake, and would lead to a fall in irrigated rice production. Another important impact of Climate Change is the sea level rise, which would increase flood risk and salinity intrusion in the Delta.

(3) Changing flow regime and agricultural water management

Irrigation development will play an important role for increasing food production to meet the increased demand in future. While the share of the irrigated area to the total arable land is quite small, particularly in Cambodia and Lao PDR, productivity in irrigated agriculture is much higher than rainfed. In case of rice which is stable food in the Region, planted area in dry season in Cambodia, Lao PDR and Thailand is less than 7% of annual total planted area. However, the share of dry season cropping in annual total production is more than 10% due to the higher yields in irrigated paddy. Yields in irrigated paddy in dry season and wet season is higher than those in rainfed paddy, 35-65% and 20% respectively. Since the arable land has been almost stable during the last decade except 2.4% of annual increase in Lao PDR, expanding irrigation area is
crucial to meet the increased food demand in future.

Scenario analysis of the Basin Development Plan Phase 2 shows that dry season flow will increase 41% at Vientiane and 22% in Kratie (definite future scenario), due to a number of hydropower developments in the main stream and tributaries in the Basin. This could provide further space to expand irrigated area.

Improving the water use efficiency in the existing irrigation schemes is also important. In the upstream three countries (Cambodia, Lao PDR and Thailand), actual irrigated area in wet season is 86% of the total irrigable area, and it is only 38% in the dry season due to the water availability in the dry season, inefficient water management practices and the deterioration of the facilities. The most important challenge for the irrigation development is how to upgrade the facilities to expand the irrigated area particularly in the dry season and improve the preparedness to the Climate Change impacts, by using the ‘development space’ provided by hydropower developments in an equitable and sustainable way among sectors and between countries, together with improving the water management practices within the sector.

In the Delta, although the irrigation performance seems to reach its maximum level (rice planted area in 2nd and 3rd season exceed those in 1st season), agricultural sector is also facing a number of challenges which include water quality problem caused by acid soil, more severe salinity intrusion caused by future sea level rising, etc.

(4) **Enhancing farmers’ livelihood**

Agricultural sector occupies 60% of the total labour but the share of the GDP is only 14% (Table 1). It means that GDP per labour force in agriculture is merely one tenth to the other sectors. Increasing farmers’ income is a key for reducing the poverty, particularly in the rural areas. It requires not only improving the productivity of their farming but also various measures which include;

- Securing regal status of farmers to access to the resources (land, water)
- Diversifying source of income from single crops to reduce the risk associated with price fluctuation, pests and natural disaster, etc.
- Improving and providing access to the market, credit service, crop insuring, better farming technology etc.
- Supplementing agricultural income with off-farm work,
- Strengthening farmers organizations and developing new enterprises such as food processing, joint purchasing of seeds, fertilizers and other materials

Diversification includes the combination of agriculture and fisheries. Although aquaculture enterprises in the past faced difficulties to some extent, decreasing trend in catch fishing production may provide opportunities for agri- and aquaculture combination. MRC’s study on the multi-functionality of paddy fields shows that paddy fields and surrounding trenches play an important role to nurture aquatic ecosystems and to support farmers livelihood. Paddy fields act as a cradle producing natural food for fish growth and in turn, this fish resource contributes to improve the living conditions for the farmers. One of the options may be the installation of buffer ponds or increased reservoir capacity of canal systems to prepare the more severe drought and to strengthen its combination with aquaculture.

Crop diversification would also contribute to improve water use efficiency in irrigated agriculture in terms of value per drop and area per drop. Since water use practices in farming plots are different between rice and other crops, structural improvement and water delivery practices in irrigation systems need to be improved.
2. Context and Rationale

2.1. Regional relevance

Agricultural water management is important in the LMB and has particular relevance to the MRC because:

- Agricultural sector is the largest water user in the Basin which should be involved IWRM-based basin development planning process nationally and regionally
- Improvement of agricultural water management would be a key factor in securing food supply for the increased demand in the future as well as reducing poverty in rural area through enhancing farmers’ livelihood
- Upgrading irrigation systems to address the deterioration, expand service area and prepare to the future severe conditions due to the climate change, is a common challenge among the Member Countries, which would require to allocate some amount of the ‘development space’

BDP Phase2 is now developing IWRM-based Basin Development Strategy for the LMB, which provides as integrated basin perspectives of the various future water resource developments and management to be assessed to ensure acceptable balance between economic, environmental and social outcomes in the Basin. It is also part of the BDP planning process to be reviewed every five years, which includes sector project database, development scenario analysis, IWRM-based development strategy and project portfolio. The implementation of this rolling cycle would be one of most valuable and important activities of MRC in the next Strategic Plan.

While the scale of individual irrigation project is small at national level, cumulative impacts on the flow regime are huge. Monitoring agricultural water use is crucial element to analyze basin wide flow regime. It is also important to guide individual projects by common references in order to maximize the benefit and minimize the negative impacts in an equitable manner, through the implementation of IWRM-based strategy where Member Countries equally participate.

2.2. National priorities

National agricultural planning and sector agencies are principally concerned with the development and management of food production systems that:

- Mitigate poverty and improve the livelihoods and nutrition of the poor;
- Achieve national food security; and
- Generate export earnings.

Cambodia: The Ministry of Agriculture, Forestry and Fisheries (MAFF) and the Ministry of Water Resources and Meteorology (MOWRAM) developed a co-ordinated Agriculture and Water Strategy (2007), which includes the following activities:

- to provide farmers with the quantity and quality of water they need, when and where they need it, and within the limits of available water resources and technology;
- to promote the rehabilitation and construction of irrigation, drainage, and flood management infrastructure, in order to provide sufficient water for agricultural production and to alleviate the adverse consequences of excess water;
- to promote the development and extension of appropriate water management technologies that are particularly suited to rain-fed agricultural areas, such as water
harvesting, improvements to the moisture-holding capacities of soils and the use of farm ponds;

• to strengthen and expand the Farmer Water User Communities, to enable them to participate in water management and allocation, and to effectively and sustainably maintain irrigation infrastructure;

• to minimise the impact on water resources from the use of chemical substances in agricultural production by encouraging people to implement diversified agriculture and Integrated Pest Management (IPM); and

• to introduce and implement the IWRM concept into the priority river basins by establishing River Basin Organisations (RBOs).

Lao PDR: The overall framework for agriculture sector development is provided in the National Socio-economic Development Strategy 2001-2010 (NSEDS) and the 6th National Socio-economic Development Plan 2006-2010 (NSED), both documents recognise the important contributions of irrigated agriculture. Whereas there is no comprehensive strategy for the agricultural sector as such, the Ministry of Agriculture and forestry (MAF) updated its strategy for the irrigation sub-sector in 2006. MAF, however, acknowledges that in future a more holistic sector strategy should establish effective linkages between research for technology development, extension of the introduction of technology and markets for both inputs and outputs.

Thailand: The Ministry of Agriculture and Cooperatives (MOAC) has recently revised its national agricultural policy, strategy and plans. It focuses on three areas: (i) water resources development, i.e. the expansion of irrigation perimeters; (ii) the optimisation of water-use – with focus on irrigation efficiency as well as participatory management of irrigation infrastructure; and (iii) mitigation of losses due to floods and droughts.

Viet Nam: There is significant amount of planning information and data for the Mekong Delta and for the upland sub-basins in Viet Nam, co-ordinated by the National Institute for Projection and Planning (NIAPP – Southern) in Ho Chi Minh City. In the Mekong Delta, the major agricultural priorities related to raising income and living standards are:

• Crop diversification;
• Improving product quality; and
• Differentiated planning in sub-areas of the delta.

2.3. Strategy review of the MRC’s role in agriculture

In 2009, strategy review of the MRC’s role in agriculture and agricultural water management was conducted. A clear outcome of the discussions with Member Countries was that they would like more active engagement of MRC in agriculture. It was confirmed that the MRC should strengthen its experience in agriculture, in order to better inform and interpret development scenarios, and to provide a continuous and active link with national agricultural planners. Elements of the MRC’s future role proposed at the end of study are:

• Agricultural knowledge base: development of stronger capacity and institutional memory in sector-related information and knowledge within the MRC itself;
• Planning support: linking basin-wide water resource planning to national agricultural sector management and planning: establishing a functional process that links MRC strategic planning to national planners, ensuring strong two-way communication and action;
• **Support to agricultural management and development:** support to (pilot) projects that have the potential for learning on cumulative and trans-boundary issues in resource management and development, or pilot replicable development solutions; and

• **Capacity development:** supporting above elements.

Taking into account the recent progress on the IWRM-based basin-wide planning, assessment and strategy formulation, and the formulation of MRC Strategy Plan 2011-2015, these four elements can be transformed as follows.

1. **Effective integration of knowledge and information on the current status and trends of the agricultural sector and related basin-wide issues into MRC and Member Country planning systems**

2. **Integration of the outputs from MRC strategic planning processes and principles of IWRM into national agricultural planning and development processes**

3. **Demonstration of the effectiveness of trans-boundary cooperation in addressing management issues in the agriculture sector**

4. **Capacity developed among Member Country agencies and staff for integrating IWRM considerations into agricultural planning and management**

These key elements would compose the basic structure of the new AIP Programme. Taking into account the proposed goal of the Strategic Plan 2011-2015 in which Member countries apply basin-wide IWRM approaches in national water and related sector frameworks and development programmes, the main activities in the new AIP should be to support Member Countries to adopt an IWRM-based water management and planning in the institutional and policy framework of the agriculture and irrigation sector.

While past projects in AIP have focused on irrigation and agricultural water use, the question is would the new phase of AIP continue to focus on that or broaden its field to the whole agricultural system and development e.g. farming systems, rural development, and poverty alleviation. Therefore, an institutional mapping to review related activities by other institutions to identify which areas should be MRC’s focus and to seek the collaboration and coordination with other organizations should be conducted at an early stage of formulation of the Programme.
3. Objectives and Programme Design

3.1. Goals, objectives and outcomes

In order to contribute to the MRC’s goal in the Strategy Plan 2011-2015, the objective of Agriculture and Irrigation Programme for the next five years would be set as:

| An IWRM-based agricultural water management and planning is adopted in the institutional and policy framework of the member countries |

In order to achieve the objective, the following outcomes and outputs would be expected.

**Outcome 1: Effective integration of knowledge and information on the current status and trends of the agricultural sector and related basin-wide issues into MRC and Member Country planning systems**

- **Output 1.1:** Classification, assessment and mapping of agricultural farming system from the viewpoint of economical and environmental performance, flood/drought vulnerability, its remedy measures, importance and potential contribution to poverty reduction and food security, irrigation development potential etc.
  
  Such information would guide national agencies which areas/regions should be given the priority and what measures should be taken for the agricultural development in each area.

- **Output 1.2:** Ground water resource mapping and assessment of its potential use for agriculture and its impacts on river system, which could play an important role to improve the preparedness to the drought by e.g. supplementing surface water irrigation.

- **Output 1.3:** Study on crop diversification (including combination of agriculture and aquaculture), which would have a number of implications on both agricultural water management and poverty reduction

- **Output 1.4:** Study on institutional strengthening and integration of farmers organizations and water users groups, which would enhance efficient water use and an increase in economical benefits

- **Output 1.5:** Real time monitoring system of flood and drought condition for agricultural farming, which would help concerned national and local agencies to prepare and implement emergency measures

Since many relevant studies and researches are already implemented or on-going by other national and regional organizations, **institutional mapping** should be conducted at first in which MRC should review the outputs of other organizations, identify which areas to be focused by MRC and seek collaboration and coordination with other organizations.

**Outcome 2: Integration of the outputs from MRC strategic planning processes and principles of IWRM into national agricultural planning and development processes**

- **Output 2.1:** Irrigation water use monitoring, which would feed the basin-wide scenario analysis

- **Output 2.2:** Development of IWRM-based planning and designing guidance for the projects
to rehabilitate, upgrade and/or expand irrigation area through improving water use efficiency and drought preparedness, together with the impacts assessment on environment, downstream water use, farmers’ livelihood, etc.

Output 2.3: Development of tools to assess the existing irrigation scheme of its current performance and potential to improve the water use efficiency, expand service area, and enhance farmers’ livelihood

Output 2.4: IWRM-based consideration to prioritize the agricultural water management projects is applied to the Project Portfolio under the Basin Development Planning Process

Output 2.5: Impact assessment of the irrigation development on the river system, poverty reduction and food security, which would support the formulation of national strategy for irrigation development

Output 2.6: Dialog with development partners for the cooperation in agricultural water management is enhanced

**BDP Planning process and the role of AIP**

Outcome 3: Demonstration of the effectiveness of trans-boundary cooperation in addressing management issues in the agriculture sector

Output 3.1: Technical and institutional support to trans-boundary agricultural water management and development projects

Output 3.2: Monitoring and research on the agricultural ground water use and changes in ground water condition in selected trans-boundary areas, which would pilot to establish the trans-boundary ground water management system

Outcome 4: Capacity developed among Member Country agencies and staff for integrating IWRM considerations into agricultural planning and management
Output 4.1: Concerned line agencies participate in various field surveys related to Output 1, 2 and 3.

Output 4.2: Trainings to facilitate adaptation of the IWRM-based guidance and other outputs in the national planning and project formulation process are conducted.

4. Implementation and Management

4.1. Linkage to the national sector framework

In order to achieve the Programme objective, adaptability of the outputs to the national policy and institutional framework is most important. In case of IWRM-based guidance, for example, it should be elaborated based on the actual situations of the sector or projects in each countries, and shouldn’t remain as the “recommendation” to the MCs but should examine its adaptability to the national frameworks through, for example, the experimental application to the pilot projects.

Other examples are irrigation database and sector review which provide fundamental data and information for the basin wide scenario analysis and is needed to be updated periodically. If such works are internalized as the basic step in the national sector planning process, these activities would be conducted more efficiently and effectively, and in turn data quality would be significantly improved.

For the case study on specific agricultural water management issues, active participation of concerned agencies is also important, since such study would provide opportunities to learn good lessons at project level.

4.2. Establishment of Steering Committee

In order to strengthen the coordination among MRC, NMCs and line agencies, Steering Committee (SC) composed by NMCs, senior officials in line agencies, OPD Director and AIP will be established. SC would monitor the AIP activities and make recommendations and suggestions for the implementation in the coming year. It will be held twice per year in principle.

4.3. Coordination with other MRC Programmes

AIP will make coordination with other relevant Programmes in order to assure more efficient and effective implementation of each activity. Table below shows possible coordination and detail will be discussed during the implementation stage.

<table>
<thead>
<tr>
<th>Activities</th>
<th>Concerned Programmes</th>
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<tbody>
<tr>
<td>Update of irrigation database</td>
<td>IKMP, M-IWRM-P</td>
</tr>
<tr>
<td>Irrigation sector review and other studies related to agricultural water management</td>
<td>BDP, CCAI, FP, DM-P, M-IWRM-P</td>
</tr>
<tr>
<td>Development of tools to analyze the impacts of agricultural water management and projects</td>
<td>IKMP</td>
</tr>
<tr>
<td>Development of IWRM-based guidance</td>
<td>BDP</td>
</tr>
<tr>
<td>Capacity building to the line agencies</td>
<td>ICBP</td>
</tr>
</tbody>
</table>
4.4. **Monitoring and evaluation**  
(To be developed during the formulation of Programme Document)

4.5. **Institutional structure of the AIP**  
Institutional structure of the AIP is shown at figure 1.

**Figure 1 Organizational structure of the AIP**

4.6. **Budget estimation**  
(To be developed during the formulation of Programme Document)

5. **Road map**

<table>
<thead>
<tr>
<th>Date</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oct 2010</td>
<td>Brainstorming discussion on the concept paper with concerned line agencies at the SEWU regional workshop</td>
</tr>
<tr>
<td>Nov 2010</td>
<td>Drafting the Project Document</td>
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<tr>
<td>Dec 2010</td>
<td>National consultation meetings</td>
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<tr>
<td>Jan 2010</td>
<td>Revising the Programme Document</td>
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<tr>
<td>Feb 2011</td>
<td>Regional workshop to finalize the PD</td>
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<tr>
<td>2011</td>
<td>Submission to the JC and Council</td>
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