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The Council Study

**Study on the sustainable management and development of the Mekong River,
including impacts of mainstream hydropower projects**

Work Plan: Formulation of Development Scenarios for the Irrigation Thematic Area

This work plan describes the roadmap and the approach for formulating the development scenarios for the **Irrigation** thematic area. It includes the following:

- Approved Cumulative Scenarios (2007 Early Development, 2020 DFS, 2040 Planned Development) and Proposed Thematic Sub-scenarios
- Detailed schedule of data collection and analysis including coordination with Member Countries through consultation with appropriate experts of line agencies, national consultations, and regional technical working group
- Detailed data needs including current status, source agencies, and known issues for each proposed development scenario
- Proposed methodology and assumptions to fill data gaps in particular where data are known to be not available
- Personnel roles and responsibilities

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1. Introduction

This work plan describes the roadmap and the approach for the formulation of the development scenarios that are going to be assessed under the Council Study. The results of these development scenario assessments will be used as the primary basis to address the overall objective of the Council Study which is to further enhance the ability of the Mekong River Commission (MRC) to advise Member Countries (MCs) on the positive and negative impacts of water resources development on people, economies and the environment of the Mekong River Basin. This enhanced ability is expected as a result of meeting the following specific objectives of the Council Study:

Objective 1: Further develop/establish a reliable scientific evidence base on the environment, social and economic consequences (positive and negative) of development in the Mekong River Basin.

Objective 2: Results of the study are integrated into the MRC knowledge base to enhance the Basin Development Planning (BDP) process providing support to the MCs in the sustainable management and development of the Mekong River Basin.

Objective 3: Promote capacity and ensure technology transfer to MCs in the process of designing and conducting of the study.

As such, the formulation of development scenarios is most critical since it defines the extent to which these three objectives can be met. The formulated development scenarios will set the boundary for what new knowledge will be generated, what knowledge gaps will be closed, and what uncertainties in the assessments will be minimized (i.e., Objective 1). The assessment methodology and the associated tools (both existing and new) along with the expanded MRC knowledge base will determine the extent of how the current BDP process can be enhanced (i.e., Objective 2). The participatory process adopted in formulating the development scenarios will govern how effective the learning-by-doing approach is with respect to building internal capacity and successfully transferring technology (i.e., Objective 3).

As per the Council Study Concept Note, Terms of Reference (ToR) and Inception Report, the assessments will include the following types:

- An assessment of the cumulative positive and negative impacts of water resource developments in all six selected thematic areas on the triple-bottom-line including clear indications of hotspots when/if relevant, and the thresholds of rapid transition—tipping points—in complex systems such as the Tonle Sap Lake in Cambodia and the Mekong Delta in Cambodia and Viet Nam (i.e., referred hereinafter as the assessment of **cumulative development scenarios**).
- Assessments for each thematic area summarising the transboundary impacts of developments in the selected thematic areas including cross-cutting impacts on the triple-bottom-line: the environmental, social and economic parameters of interest in the Mekong River Basin (i.e., referred hereinafter as the assessment of **thematic development sub-scenarios**)

In the end, the Council Study will produce a set of clear, strategic, pragmatic and actionable recommendations directly addressing potential uncertainties, risks and the information needs for

development planning in the mainstream of the Lower Mekong Basin (LMB) including recommendations for impact avoidance and mitigation measures.

The Irrigation Thematic Area

Irrigation is the largest water user in the Lower Mekong Basin (LMB) but it only uses 12% of the average annual flow. All the countries of the Basin have policies and plans to expand irrigation areas to increase rice production and exports, diversify food production, respond to food security needs and address rural poverty. Various scenarios of current and planned developments suggest that future flows in the mainstream will accommodate the expansions of irrigation areas planned by all countries.

Differences are characterizing this expansion among the regions of the basin. First, some countries have seen a low development of the irrigation sector in the past 30 years with respect to others that have developed rapidly their irrigation infrastructures up to the 2000's: this is the case for Laos and Cambodia that have had a limited development compared to Thailand and Viet Nam. The total developed irrigated area within the LMB is up to 4.0 million hectares in the present state¹. The share of each country is presented in the figure below:

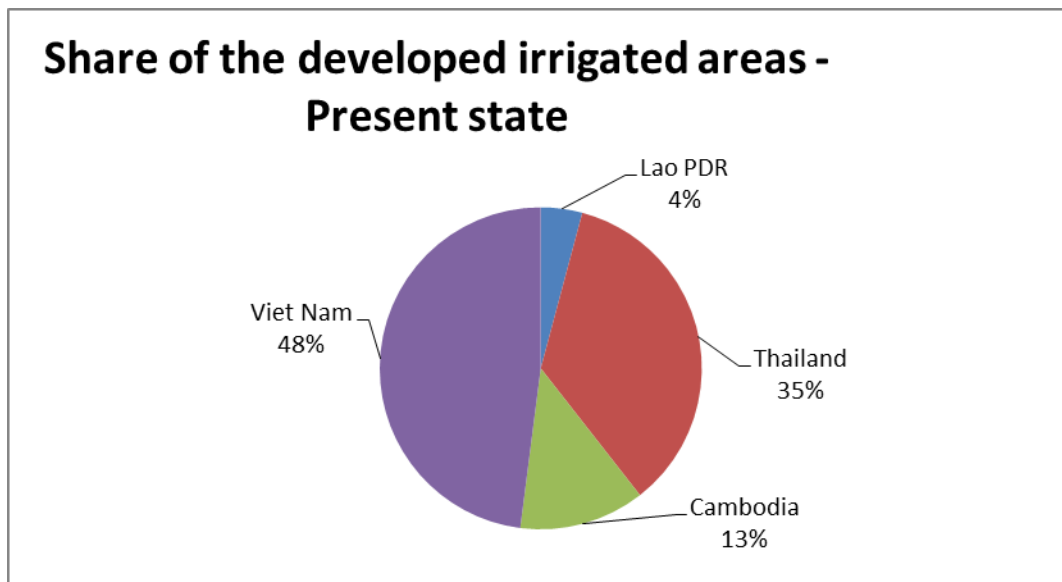


Figure 1: Share of the developed irrigation areas in the present state

According to the information of the BDP2, the total irrigation area could more than double in the far future, reaching up to 9.7 million hectares. In these hypothetical plans, Laos, Cambodia and Thailand would increase dramatically their area development, whereas Viet Nam would only see a very limited one. These plans will need to be analyzed in space and time.

The central role of the irrigated agriculture in the future of the LMB, being a major water consumer and generating numerous impacts, is a key sector to be analyzed within the Council Study.

¹ Figures from the BDP2 corresponding to 2009

The council study will prepare a report that will analyze the positive and negative impacts of the planned irrigation development in the LMB in order to provide recommendations for impacts avoidance and mitigation measures.

Among the objectives of the study for this theme, it is proposed to analyze the rate of irrigation expansion and the induced changes in flow parameters. The assessment of the Irrigation thematic area will provide key information on the resulting changes in environmental, social and economic parameters including issues of food security, employment and transboundary benefits and costs. Out of the analysis on this triple bottom-line, the study will also cover the impacts of irrigation on fisheries and of other developments on irrigation including dry season irrigation.

2. Development Scenarios

The development scenarios will be formulated by defining levels of developments in six thematic areas for each scenario. The six thematic areas are:

- Irrigation; including water use, return flows, water quality, proposed diversions, etc.
- Agriculture and Land use; including watershed management, deforestation, livestock and aquaculture, fisheries etc.
- Domestic and Industrial use; including mining, sediment extraction, waste water disposal, urban development, water quality etc.
- Flood protection structures and floodplain infrastructure, including roads on major floodplains
- Hydropower, including potential of alternative energy options.
- Navigation, specifically on infrastructure to aid navigation

The development scenarios will be of two types namely cumulative development scenarios and thematic sub-scenarios.

2.1.Cumulative Scenarios

The cumulative scenarios are based on historic (2007) and planned (2020 and 2040) basin-wide developments in the six thematic areas. These cumulative scenarios will allow the assessment of cumulative positive and negative environmental and socio-economic impacts associated with planned developments by the MCs. The assessment will show the predicted changes in the environmental and socio-economic conditions in the LMB in space and time and potentially reveal clear indications of geographic hotspots and rapid transitions in time as a result of combined developments in the six thematic areas. Along with the results of the assessment of selected thematic sub-scenarios under which impacts of specific-thematic developments can be better understood, realistic, reasonable, and thus actionable development options and management measures can be identified to enhance positive impacts and minimize negative impacts of the planned developments. Strategic measures for long-term negative impact avoidance and risk mitigation can also be identified for development planning considerations by the MCs.

During the 4th RTWG Meeting, the following cumulative development scenarios were approved for the Council Study.

Early Development Scenario/Situation (2007): This scenario covers the period from the beginning of large-scale water resources development until the year 2007 when the flow regime of the Mekong mainstream was considered to be still in its natural state. This scenario includes the water infrastructure and the land use/cover changes in in the six thematic areas by 2007.

Definite Future Scenario (2020): This scenario includes all existing (before and after 2007), undergoing construction, and firmly committed development infrastructure in the six thematic areas which are expected to be in place by 2020.

Planned Development Scenario (2040): This scenario includes all water resources development that is planned in the six thematic areas in the Mekong Basin and are expected to be in place by 2040 assuming these plans are fully implemented.

2.2. Thematic Sub-Scenarios

The Thematic Sub-Scenarios represent plausible thematic-specific deviations from the 2040 Planned Development Scenario. These thematic-specific deviations reflect level of uncertainties in the full implementation of the planned development level for the thematic area of interest as per the 2040 Planned Scenarios. These deviations can be due to several factors such as changes in national development policies and priorities, technology, demography, socio-economic conditions, global context, etc. The deviations are formulated around the 2040 Planned Scenario to keep these thematic sub-scenarios plausible. It should be noted that while a different level of development is used for the thematic area of interest, the levels of development for the other thematic areas are held equal to the planned 2040 levels.

The assessment of these thematic sub-scenarios will provide the following understanding:

- Sensitivity of impacts to deviations from planned development levels
- Better understanding of impacts of specific development stressors (i.e., closing knowledge gaps)
- In-depth analysis of the plans and plausible deviations in the plans (i.e., understand uncertainty in the plans and identify measure to minimize deviations)
- Increase understanding and capability to explore options and measures to enhance positive impacts and mitigate/reduce negative impacts

As per the Inception Report, a maximum of three thematic sub-scenarios per thematic area will be assessed. However, the Thematic Team may identify more than three potential thematic sub-scenarios. These thematic sub-scenarios will be presented to the MCs to get their input and final concurrence on what thematic sub-scenarios to assess.

2.3. Proposed Thematic Sub-Scenarios for the Thematic Area Irrigation

The Irrigation thematic area will be analyzed within the cumulative scenarios for different time scales corresponding to the Early Development Scenario / Definite Future Scenario and Planned Development Scenarios (PDS).

As per the Inception Report, three Alternative Development sub-scenarios are proposed in this section. These sub scenarios are characterized by variations from the PDS according to different driving factors representative of the Thematic Area. The number of scenarios that might be analyzed is listed in the table below:

Table 1: List of scenarios for the Irrigation Thematic area

		Scenario	Sub Scenario
<i>ED</i>	2007	1	0
<i>DFS</i>	2020	1	0
<i>PD</i>	2040	1	3
		3	3

The following 3 sub scenarios are formulated for the 2040 horizon:

- A *minimum* expected development (MIND),
- A '*most likely*' expected development (MLD) and,
- A *maximum* expected development (MAXD).

2.3.1. Drivers Considered for the formulation of the scenarios

The Irrigation process involves a multiplicity of factors that independently influence the potential development the sector may have. The figure below illustrates the simplified process retained within the council study.

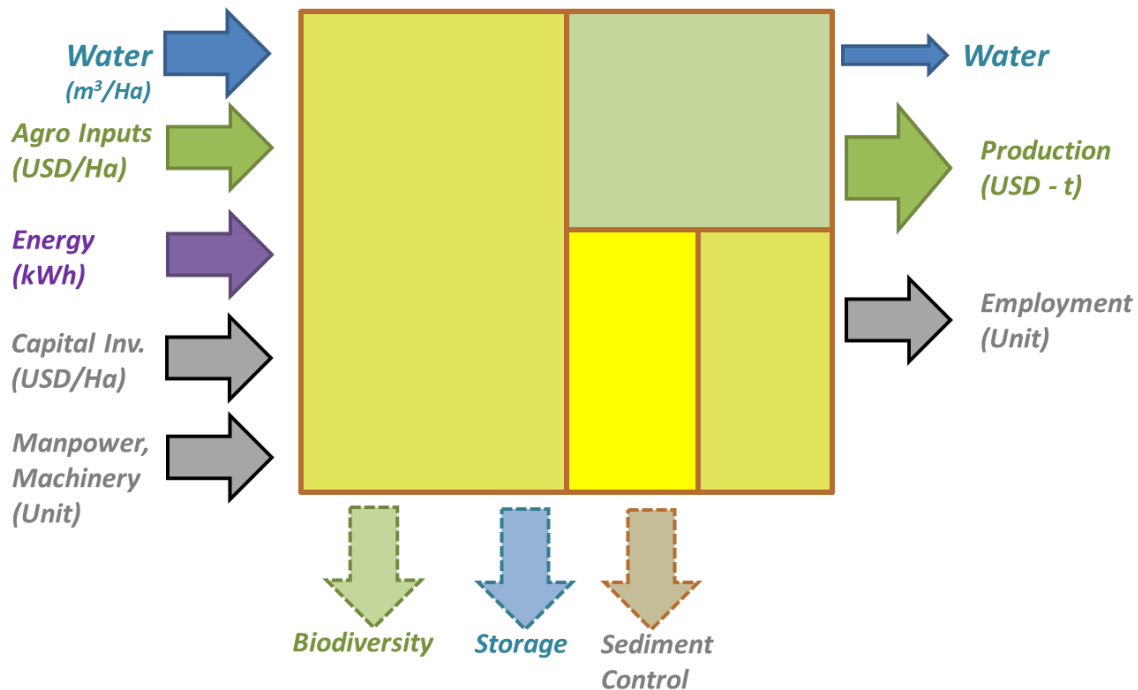


Figure 2: Illustration of the Irrigation development process

The concept concentrates on input factors (Water, Agricultural Inputs, Energy, Capital Investment and manpower) that are required for the irrigation development (in terms of area increment or service enhancement) that will generate direct outputs (Water, Employment, Production) and impacts the social, environmental and economic bottom lines.

The delineation of the sub scenarios is guided by the following drivers² that will influence the development that might occur:

- The Investment Plan and Policy on Irrigation Infrastructure
- The Improvement on Water Use Efficiency

² In the first version of the document, proposal had been made to analyze the Development Policy on Sustainable Agriculture, but after discussions, this driver is more related to the agricultural development rather than to the Irrigation thematic area.

Although the two drivers are inter-linked, it is proposed to define their flexibility through the following justifications. Each sub-scenario could consider them dually, with an increased or decreased consideration of the driver.

In terms of development, we intend here the increase of the irrigated areas in the scenario respect to the baseline. This irrigated area expansion could come from:

- The creation of new Irrigation projects through the investment in infrastructures (headworks, canals, pumping stations, etc.) that will allow the distribution of water over an irrigation area that will be turned from a rainfed (or unproductive) area into an area allowing different cropping seasons.
- The Rehabilitation of existing irrigation projects through the investment in infrastructure and water management allowing an increase in the irrigated areas for each season.

The two drivers mentioned can act either on the creation or on the rehabilitation process.

2.3.2. Driver 1: Investment Plan and Policy on Irrigation Infrastructure

The planned development of the Irrigation sector for the 2040 Horizon and the level of its achievement is a source of uncertainty. The MCs may reduce or increase their level of investment in the Irrigation development thus resulting in different impacts. It is therefore plausible that the proposed level of irrigation development will evolve. Starting from the global investment figures of the PDS, it is proposed to measure the effects of a variation on the infrastructure investment. The variations to be studied could be the following:

- Low level of investment
- Medium level of investment
- High level of investment

Although the investment could be targeted on different topics (Creation of new schemes, rehabilitation of existing schemes or infrastructures, etc) the effects of the variations of the investment policy will be assessed through the following indicators:

- Developed Irrigation Areas (000 Ha)³ (+ or -)
- Cropped areas (Rice and non-rice) (000 Ha) (+ or -)
- Crop Production (t) and associated production value (USD) (+ or -)
- Water Demand and Return Flow (by project or group of projects) (MCM) (+ or -)

The assessment methodology for the sub scenarios is further detailed in section 0

Within the member countries, some zones (Northeast Thailand, central Laos and Southeast Cambodia) are envisaged to see a huge development respect to others. Some regional differences in the development will be considered. The MCs will guide the study with relevant inputs on the priority of their developments.

³ The areas accounted shall either be newly created or rehabilitated

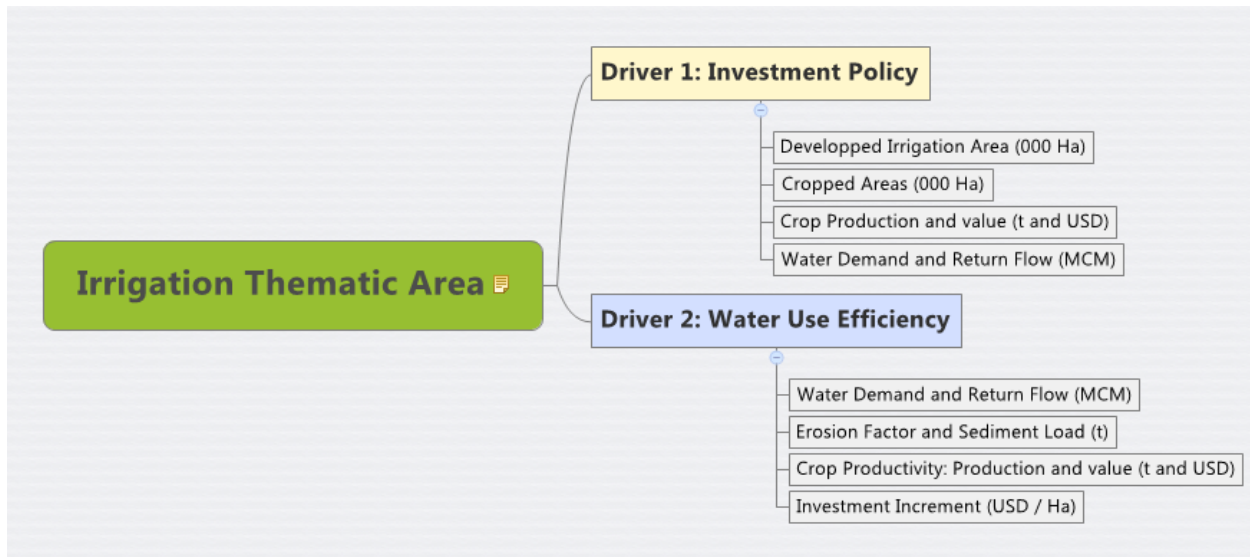


Figure 5: Proposed drivers on formulating sub scenarios for the Irrigation Thematic Area and related indicators

2.3.4. Formulation of the sub-scenarios

The previous paragraphs have proposed the selection of drivers that should be considered for the sub-scenario formulation. While trying to avoid the multiplicity of scenarios to be further assessed by the team, it is proposed to consider a minimum of three scenarios corresponding to the a) minimum expected development (MIND), b) 'Most likely' expected development (MLD) and, c) maximum expected development (MAXD) in a combination of the two drivers.

1. minimum expected development (MIND)

This scenario would combine a low level of investment with a limited improvement of water use efficiency. In this case, priority will be given for the investment policies on the scheme rehabilitation rather to the creation of new ones. Spatial differences occurring in the priority of the investment shall be indicated by the MCs.

2. 'Most Likely' expected development (MLD)

This scenario would combine a medium level of investment with a medium improvement of water use efficiency. The share of the investment between the creation and the rehabilitation, together with the spatial distribution would be balanced.

3. Maximum expected development (MAXD).

This scenario would combine a high level of investment with a high improvement of water use efficiency.

The figure below illustrates the concept of the three sub-scenarios.

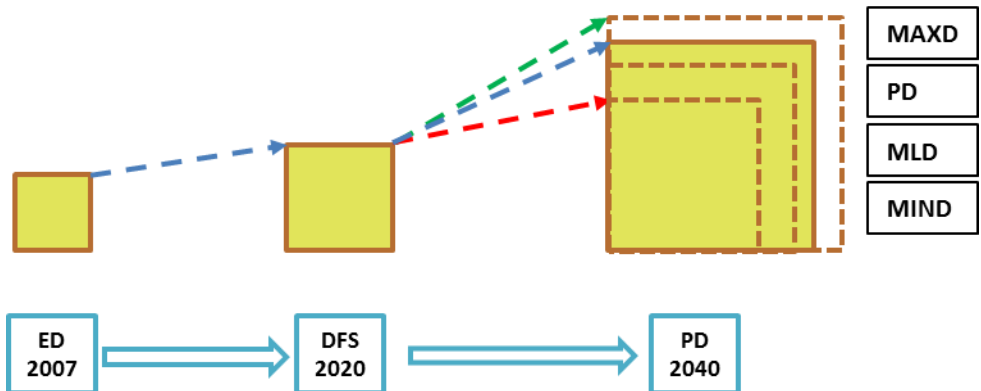
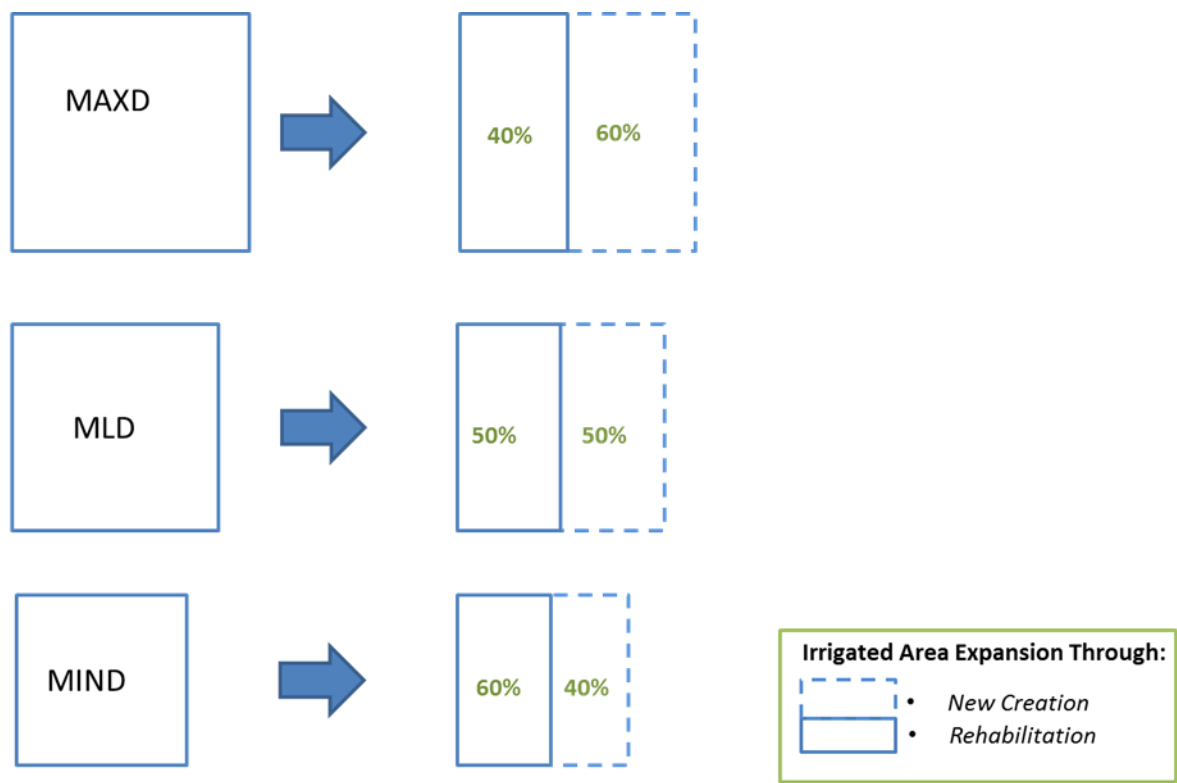


Figure 6: Development of the sector from the early Development Stage (Baseline) to the Planned Development scenario



The shares are only indicative and will be adjusted by country based on the indications of the NC

Figure 7: Differences in the shares between creation and rehabilitation for the three sub-scenarios.

2.3.5. Assessment of the sub-scenarios

The assessment of the sub scenarios will be conducted based on the variations of the values of specific indicators and through the application of the assessment methodology proposed for the Council Study in the inception report.

- **Indicators for the Impact Infrastructure Investment**

Although the investment could be targeted on different topics (Creation of new schemes, rehabilitation of existing schemes or infrastructures, etc) the effects of the variations of the investment policy will be assessed through the following indicators:

- Developed Irrigation Areas (000 Ha)⁴ (+ or -)
- Cropped areas (Rice and non-rice) (000 Ha) (+ or -)
- Crop Production (t) and associated production value (USD) (+ or -)
- Water Demand and Return Flow (by project or group of projects) (MCM) (+ or -)

The impacts will be measured through these indicators as differences with the baseline scenario (ED - 2007)

- **Indicators for the Impact water use efficiency**

The effects of an increased or decreased Water Use Efficiency will be assessed through the following indicators:

- Change in the Water Demand / Supply pattern and in the return flow (MCM) (+ or -)⁵
- Change in the Irrigation Efficiency figures
- Crop Production (t) and associated production value (USD) (+ or -)
- Increased Investment (USD/Ha)⁶

Further, through the application of the Council Study methodology, the impacts on the hydrologic regime of the Mekong and on the social, economic and environmental aspects (triple bottom line) will be assessed:

- Hydrologic assessment of the impacts of the irrigation development made on the basis of the MRC's suite of simulation models. This will be carried out by the modelling team.
- Triple Bottom Line assessment of the impacts of the irrigation development based on the MRC indicators framework. This will be carried out by the discipline team.

⁴ The areas accounted shall either be newly created or rehabilitated

⁵ An increased efficiency will lower the water losses at the global scheme level and at the farm level resulting in less seepage, reduced return flows and water savings.

⁶ The increment of the water use efficiency is linked to higher investment costs either on farm or for the infrastructure

3. Data Requirements

The data availability is one of the key issues that will allow the development of the proposed scenarios. On the basis of the concept of the irrigation process proposed in Figure 2, the information related to each of these factors shall be collected.

The information shall be made available temporally for each of the proposed time frames featured for the Council Study (i.e. 2007 / 2020 / 2040), and spatially allowing the geographic location of the information.

From the data collected during the BDP2 it appears that (except for Thailand) the irrigation sector is currently and will still be characterized by a majority of small schemes. The total number of schemes exceeding 10,000 Ha will be 115 in the long term development over a total of 15549.

Table 2: Summary of the irrigation development for the 4 countries from the BDP2

	EXISTING			20 YEAR			LONG TERM			
	Average Area of project (Ha)	Nbr of Projects	Total Area (Ha)	Average Area of project (Ha)	Nbr of Projects	Total Area (Ha)	Average Area of project (Ha)	Nbr of Projects	Total Area (Ha)	Nbr of PJ>10k Ha
Cambodia	238	2123	504245	367	2123	778499	545	2123	1156025	19
Lao PDR	33	5101	166476	89	5101	451679	141	5101	717485	4
Viet Nam	191	7378	1411807	320	7378	2357969	325	7378	2396711	34
Thailand	2027	947	1919623	2159	947	2044788	2178	947	2062620	58

It is hence proposed to separate the data collection for the large schemes and for the remaining ones. The data for the large schemes shall be collected individually, focusing on the 20 biggest schemes of each member country. For the remaining schemes, the data should be aggregated at a province level.

A set of blank spreadsheets has been prepared and will be transmitted to each national consultant for compilation. These are presented in annex. The topics covered by the data collections are presented on Table 3 below.

Table 3: Topics to be covered by the data collection

DEVELOPMENT
· Areas equipped for irrigation (ha)
· Wet, dry and 3 rd season irrigated areas (ha)
· Non-rice crop area (ha)
WATER
· Cropping calendars
· Evapotranspiration data (mm) by project and timestep
· Gross irrigation water Requirement (Rice and Non rice) (m ³ /ha)
· Return Flow and location (m ³ /ha) by project and timestep
INFRASTRUCTURE
· Existing Infrastructures and Reservoirs
· Conveyance, On Farm and Overall Efficiency (%)
· Cost for Conveyance Infrastructure (USD/Ha)
· Cost for On Farm Infrastructure (USD/Ha)
· O&M Cost per Year (USD/Ha/Year)
· Energy Cost per Year (USD/kWh/Year)
CROP
· Crop Production (t)
· Production Value (USD)
· Crop Production Cost (USD/ ha)
· Crop Intensity (%) by project
· Mechanization level (units to be determined)
ENVIRONMENT
· Erosion load (t/Ha) by project and timestep
· Return flow water quality (units to be determined)

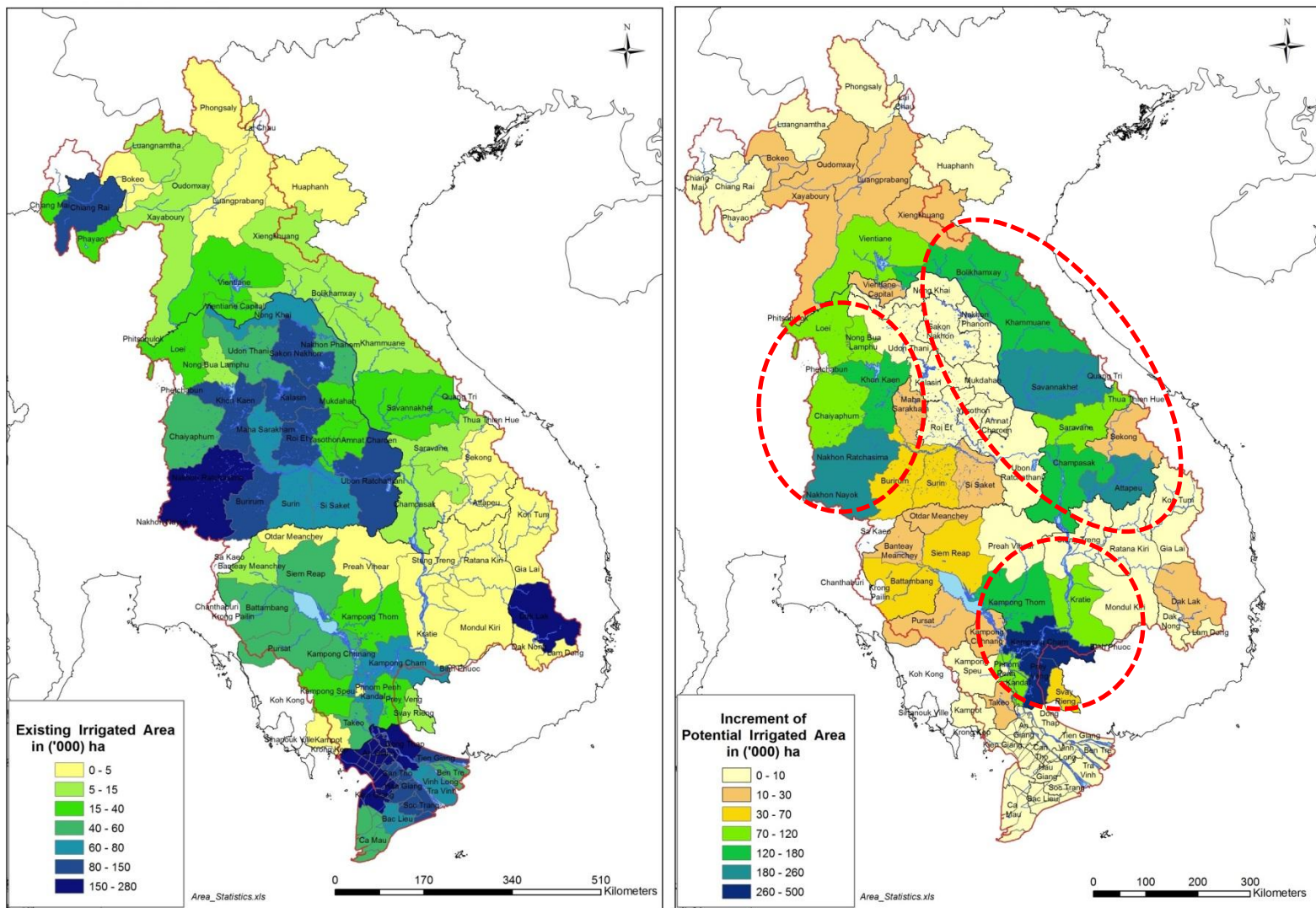


Figure 8: Present (2007-left) and future development of the Irrigation sector. (Source: BDP2)

4. Handling of Data Gaps

The data required for the scenario development are presented in the previous tables and will be compiled into the data sheets communicated. It is the duty of each MCs to bring their contribution. The national consultants are contracted to work on those issues.

From the preliminary information available, the databases characterizing the present irrigation development for Laos, Thailand and Vietnam are completed and will soon be made available to the team.

For Cambodia, a database (CSIS) is under finalization and will be transmitted to the two national consultants that will work on the issue soon.

This shall characterize the baseline, for the early Development Stage (ED).

The strategy proposed for handling of data gaps is the following:

1. Discussions will start during the working sessions with the national consultants to set up a comprehensive list of the available data within the MCs and the MRC's databases as a result of the past activities. Based on the list of data requested, and the agreed sub-scenarios to be studied, each national consultant will draw up a list of the data available, for each time-frame. The data listing activity will be strongly interfaced with the GIS to allow a direct and rapid evaluation of the spatial location of the information.
2. The data gaps will be identified for each country and for each type of data. Therefore, assumptions will be proposed by the national consultant in collaboration with the other experts of the team to identify the best solutions to fill the gaps. As an example, national averages could be used to fill the data in areas spatially not characterized, other solutions issued from scientific literature and the judgment expert will be inquired. A set of primary and secondary parameters will be identified, with the possibility to estimate the missing values based on the first ones.
3. Based on the gap filling strategy adopted, the data set will be finalized to allow the scenario development and further assessment.

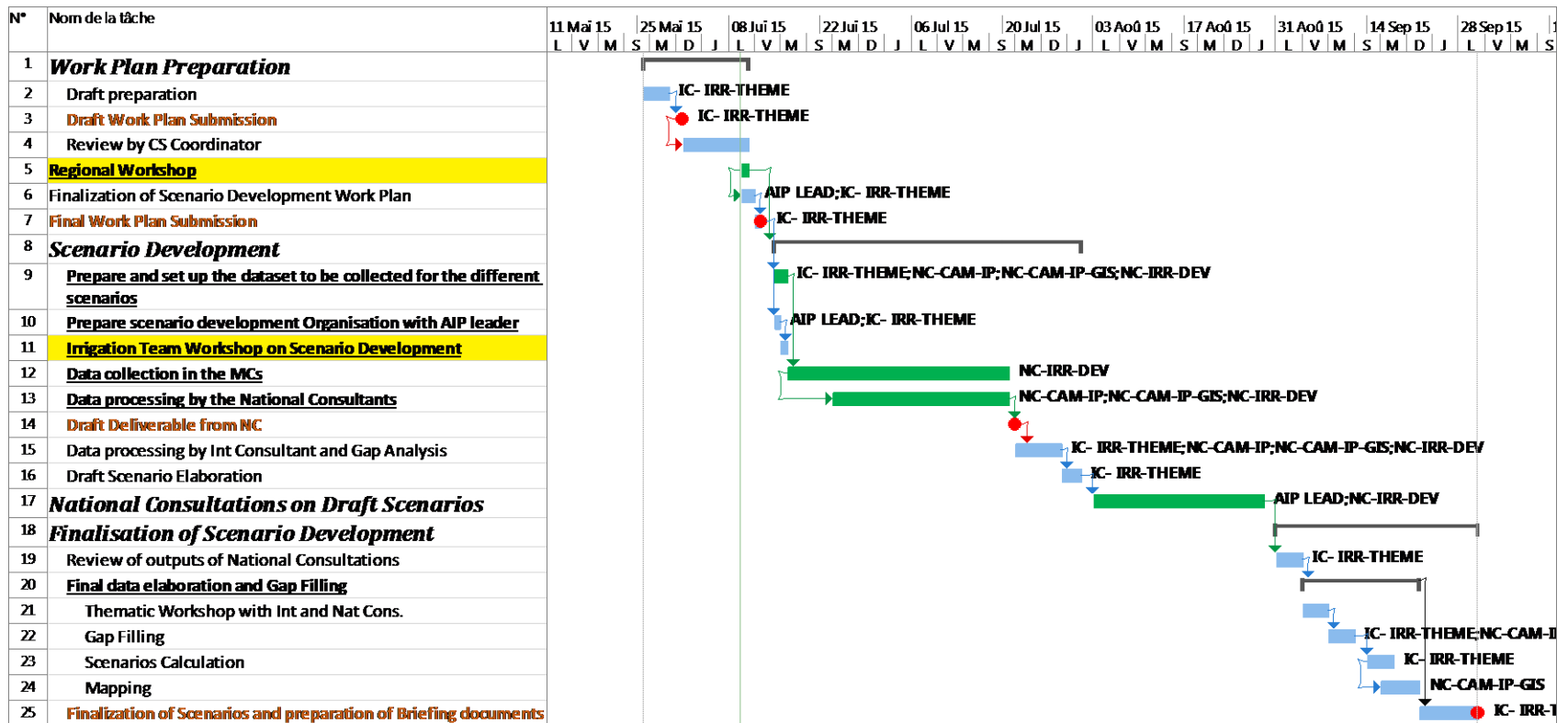
5. Detailed Schedule

The table below shows the proposed detailed schedule for formulating the development scenarios for the Irrigation Thematic Team. The table is associated with its time chart.

Irrigation Thematic Area Schedule (DRAFT)

TASK	START	END	Ressources
<i>Work Plan Preparation</i>	26/05/2015	10/06/2015	
Draft preparation	26/05/2015	29/05/2015	Irrigation International Consultant
Draft Work Plan Submission	01/06/2015	01/06/2015	Irrigation International Consultant
Review by CS Coordinator	01/06/2015	10/06/2015	
<u>Internal AIP Workshop</u>	10/06/2015	10/06/2015	
Finalization of Scenario Development Work Plan	10/06/2015	11/06/2015	AIP Team Leader;Irrigation International Consultant
Final Work Plan Submission	12/06/2015	12/06/2015	Irrigation International Consultant
<i>Scenario Development</i>	15/06/2015	31/07/2015	
<u>Prepare and set up the dataset to be collected for the different scenarios</u>	15/06/2015	16/06/2015	Irrigation International Consultant;National Consultant on Cambodian IP ;National Consultant on Cambodian IP GIS ;National Consultant on Irr Development
<u>Prepare scenario development Organisation with AIP leader</u>	15/06/2015	15/06/2015	AIP Team Leader;Irrigation International Consultant
<u>Irrigation Team Workshop on Scenario Development</u>	25/06/2015	25/06/2015	
<u>Data collection in the MCs</u>	25/06/2015	20/07/2015	National Consultant on Irr Development
<u>Data processing by the National Consultants</u>	25/06/2015	20/07/2015	National Consultant on Cambodian IP ;National Consultant on Cambodian IP GIS ;National Consultant on Irr Development
Draft Deliverable from NC	21/07/2015	21/07/2015	
Data processing by Int Consultant and Gap Analysis	22/07/2015	28/07/2015	Irrigation International Consultant;National Consultant on Cambodian IP ;National Consultant on Cambodian IP GIS ;National Consultant on Irr Development
Draft Scenario Elaboration	29/07/2015	31/07/2015	Irrigation International Consultant
<i>National Consultations on Draft Scenarios</i>	03/08/2015	28/08/2015	AIP Team Leader;National Consultant on Irr Development
Separate Meetings with the4 MCs	03/08/2015	28/08/2015	AIP Team Leader;National Consultant on Irr Development

TASK	START	END	Ressources
<i>Finalisation of Scenario Development</i>	31/08/2015	30/09/2015	
Review of outputs of National Consultations	31/08/2015	03/09/2015	Irrigation International Consultant
<u>Final data elaboration and Gap Filling</u>	04/09/2015	21/09/2015	
Thematic Workshop with Int and Nat Cons.	04/09/2015	07/09/2015	
Final Data Collection	08/09/2015	11/09/2015	Irrigation International Consultant;National Consultant on Cambodian IP ;National Consultant on Cambodian IP GIS ;National Consultant on Irr Development
Gap Filling	08/09/2015	11/09/2015	Irrigation International Consultant;National Consultant on Cambodian IP ;National Consultant on Cambodian IP GIS ;National Consultant on Irr Development
Scenarios Calculation	14/09/2015	17/09/2015	Irrigation International Consultant
Mapping	16/09/2015	21/09/2015	National Consultant on Cambodian IP GIS
Finalization of Scenarios and preparation of Briefing documents	22/09/2015	30/09/2015	Irrigation International Consultant



6. Personnel Roles and Responsibilities

This section should identify the names of the personnel involved and their roles. In particular, it should include the technical lead and national consultants and Program Management Lead.

Type	International Consultant
Topic	Irrigation Thematic Area
Outputs	Compile and Consolidate Literature Review
	Develop Scenarios
	Prepare Thematic Report
	Prepare Working Paper
	Coordinate team and thematic area

Type	National Consultant	National Consultant	National Consultant
Topic	Cambodian IP	Cambodian IP GIS DB	Irrigation Development
Outputs	Review of existing database and geoDB on Cambodian IP	Review of existing database and geoDB on Cambodian IP	Literature Review on Irrigation Development
	Plan to collect and improve database	Plan to develop existing GIS	review the list of Indicators for the assessment
	Data collection and GIS Update	Update IP GeoDB	Strategy for Data collection / gap filling
	Finalization of GeoDB	Reporting	Assessment and update on Irr Development and description of selected projects
	Reporting		Map of Planned and existing IP - Assessment of water Intake & Return Flows
			Reporting

List of National Consultant for Irrigation Thematic Team June 2015					
No.	Title of Consultant	Country /National Consultant			
		Cambodia	Laos	Thailand	Viet Nam
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Annexes: Data Collection Sheets

Instructions for the data collection for the Irrigation Thematic Area

Some data collection forms have been prepared to gather the information related to the existing and planned Irrigation projects for each member country.

The spreadsheets are prepared in an excel format.

It is first of all envisaged to separate the data collection for the large scale irrigation projects and for the medium and small scale irrigation projects. This choice has been made because the information should be readily available for the specific large scale projects, whereas it is generally aggregated at a district or province level for the medium and small scales.

So, the national consultant responsible for the data collection will have two forms:

1. The form for the large scale Irrigation projects

This form collects the details of the existing or planned irrigation project for each sector proposed in section 3 of the document. The data should be carefully inserted in the cells in green. The guidelines on the data needed are indicated in the spreadsheet.

Any additional document related to the project will be given in an annex: maps, GIS files, time series, etc.

If no data are available for the single large project, but available as aggregated with the small and medium projects at the province level, the consultant will clearly report it.

2. The form for the medium and small scale

This form collects the data of the existing or planned irrigation project for each sector proposed in section 3 of the document. In this form the data should be aggregated at a province level. The data should be carefully inserted in the cells in green. The guidelines on the data needed are indicated in the spreadsheet.

Any additional document related to the project will be given in an annex: maps, GIS files, time series, etc.

Additional instructions:

- a) Each sheet should be clearly identified with the project name (for large projects) or with the province name (for small and medium projects)
- b) The national consultant should prepare a summary report indicating his activity of datasheet filling with all the information to understand the assumptions that were made or the specific situation of a single project or a province
- c) If for a project or a province, the data were only partially available; the consultant will only insert the known data.
- d) Any question raised during the activity of data filling should be send by email to the AIP team.