	MEKONG RIVER COMMISSION SECRETARIAT	
	Office of the Secretariat in Vientiane 184 Fa Ngoum Road, Ban Sithane Neua, P.O. Box 6101, Vientiane, Lao PDR Tel: (856-21) 263 263 Fax: (856-21) 263 264	Office of the Secretariat in Phnom Penh 576 National Road, no. 2, Chak Angre Krom, P.O. Box 623, Phnom Penh, Cambodia Tel: (855-23) 425 353 Fax: (855-23) 425 363
	mrcs@mrcmekong.org	www.mrcmekong.org

MRC Initiative on Sustainable Hydropower (ISH)

IMPROVED ENVIRONMENTAL AND SOCIO-ECONOMIC BASELINE INFORMATION FOR HYDROPOWER PLANNING

ISH11 PHASE 2 REPORT: Socio-Economics Annex



20 December 2013

MRC Initiative on Sustainable Hydropower (ISH)

Abbreviations and Acronyms

BDP	Basin Development Plan (of the MRC)
DAC	Development Co-operation Directorate under OECD
DSS	Decision Support System
DPSIR	Drivers, Pressures, State, Impacts, Responses
EP	Environment Programme (of the MRC)
FP	Fisheries Programme (of the MRC)
GIS	Geographic Information System
IBFM	Integrated Basin Flow Management
IKMP	Information and Knowledge Management Programme (of the MRC)
ISH	Initiative on Sustainable Hydropower (of the MRC)
ISO	International Standards Organisation
IWRM	Integrated Water Resource Management
LMB	Lower Mekong Basin
MRC	Mekong River Commission
MRCS	Mekong River Commission Secretariat
NMC	National Mekong Committee
OECD	Organisation for Economic Co-operation and Development
PFMF	Procedure for Maintenance of Flows on the Mainstream
PSIA	Poverty and Social Impact Assessment
QA/QC	Quality Assurance / Quality Control
SIMVA	Social Impact Monitoring and Impact Assessment
SoB	State of the Basin
ToR	Terms of Reference
UMB	Upper Mekong Basin

Table of Contents

Abbreviations and Acronyms.....	i
List of Figures	iii
List of Tables	iii
1 Context of Socio-economics in the ISH11 Project	1
2 Best Practice for Socio-economic Monitoring Programmes.....	3
2.1 Social Sustainability	3
2.2 Economic Sustainability.....	4
2.3 Monitoring of socio-economic impacts from hydropower	5
2.4 Important Considerations for Best Practice Monitoring.....	8
3 Literature Review and State of Knowledge	10
3.1 Basin-wide Socio-economic Data	11
3.2 Socio-economic Monitoring Data: SIMVA	12
3.3 Macroeconomic Data	14
3.4 State of Knowledge regarding Hydropower-Relevant Socio-Economics	15
4 Gap Analysis with Respect to ISH11 Guiding Framework	18
4.1 Socio-Economic Information Needs	18
4.2 Present Status	18
4.3 Gap Analysis - Locations	19
4.4 Gap Analysis - Parameters.....	21
4.4.1 Parameters identified in Phase I	22
4.4.2 Hydropower relevant socio-economic indicators and parameters in MRC context	26
4.4.3 Need for data from line agencies	26
4.5 Gap Analysis - Timing	26
4.6 Gap Analysis - Information Management	29
4.7 Gap Analysis - Information Use	30
4.7.1 Capacity for Data Analysis	30
5 Socio-Economics Improvement Proposals for Hydropower Information	31
5.1 Approach and Rationale	31
5.2 SE1: Macro-Economic and Energy Indicators for Hydropower Information	31
5.3 SE2: SIMVA Enhancements for Hydropower Information	32
5.4 SE3: Mekong River Cultural and Religious Sites	35
6 Conclusion	37
7 References	38
Attachment 1 – Annotated Bibliography.....	40
Attachment 2 – Comments and Responses Regarding Socio-Economics Data in the ISH11 Report	49
Attachment 3 – Sacred sites on the Mekong and tributaries in Lao PDR.....	51

List of Figures

Figure 1 – SIMVA Timeline	12
Figure 2 – SIMVA Socio-ecological Zones and Sub-zones for 2014	13
Figure 3 – Information Needs Relating to Economic Dimension.....	18
Figure 4 – Information Needs Relating to Social Dimension	19
Figure 5 – Example of Spatial Use of Socio-economic Data – Hydropower Locations and District Level Data	21
Figure 6 – Timeline of National Census’s and Surveys	28
Figure 7 – Time Dimensions of the 3 SIMVA Data Collection Instruments	29

List of Tables

Table 1 – Thematic Areas of the Social Sustainability Concept.....	3
Table 2 – Hydropower Sustainability Protocol Guidance Notes, Examples of Socio-economic Parameters	6
Table 3 – Ex Ante Poverty Impact Assessment generic reporting table.....	7
Table 4 – MRC Currently-Held Socio-Economics information.....	10
Table 5 – Available Official Socio-economic Data	11
Table 6 – MRC 2010 State of the Basin, Socio-economic Indicators.....	15
Table 7 – BDP Assessment of Social Impacts of Hydropower Development	17
Table 8 – Vulnerability to Hydropower Development	17
Table 9 – Social Parameters and Hydropower Relevance.....	22
Table 10 – Economic Parameters and Hydropower Relevance	23
Table 11 – Potential Climate Change and Natural Capital Parameters.....	24
Table 12 – Combined and Restructured List of Social and Economic Parameters.....	25
Table 13 – Overview of MRC’s Socio-economic Data Sources	29

1 Context of Socio-economics in the ISH11 Project

- Expected economic and social benefits at the household, enterprise (project), national and regional levels are the drivers of hydropower development in the Lower Mekong Basin (LMB). Good economic and social information and indicators are therefore essential for the planning, implementation, operation and monitoring of hydropower.
- As part of the ISH11 study these socio-economic information needs are most effectively addressed through development of an integrated socio-economic set of parameters and indicators that are clearly relevant to hydropower. These would be a “hydropower relevant” subset of a larger set of socio-economic indicators being proposed through the Basin Development Programme (BDP) for the broader work of the MRC. Socio-economic information is taken here to cover the full range of social, demographic, household, enterprise, and government data. This data may be sourced and/or portrayed at different levels or administrative scales and it is often amenable to aggregation at higher levels through to the national or regional scale.
- The social and household-level indicators that are considered in ISH11 cover a broad range of activities in society with a delimiting criterion of including only those that are directly related to hydropower or can be attributed to hydropower development with a reasonable degree of accuracy. The social indicators are closely linked to several environmental and natural resource indicators, especially those relating to fisheries and flood management, where the link between river water resources and livelihoods and economic activities is direct. These indicators are often sourced at a local level and reflect the direct sphere of influence of one or more hydropower projects on local livelihoods.
- Enterprise indicators for hydropower projects are covered by ISH in two separate efforts. Within ISH11 the hydropower project database (ISH11 Improvement Proposal H1) is designed to record and monitor project information as projects proceed from design to construction and into operation. Part of this information may include tracking estimates from the evaluation of the financial and economic aspects of hydropower projects – including both direct project costs and benefits, mitigation costs, and indirect social and environmental impacts (positive or negative). Concurrent with ISH11, a separate ISH project ISH02 is developing Guidelines for the Multipurpose Evaluation of Hydropower Projects. This project is undertaking an assessment of valuation approaches and valuation studies in order to provide practical and replicable guidelines for the evaluation of hydropower projects, including those with multi-purpose benefits, in the LMB. The ISH02 work relates to project evaluation and the ranking and selection of projects and portfolios of projects. Therefore, the ISH02 effort is not about information to support basin-scale hydropower planning and management information needs. It is project-specific economic information; it is an effort to assist with the actual mechanics of hydropower planning.
- Project valuation efforts that are part of project or planning evaluations are in fact one user of the basin-scale information for which ISH11 is reviewing and recommending improvements. As a result of its coverage elsewhere under ISH11 and within ISH02 the microeconomics – valuation and evaluation – of hydropower projects is not covered under the Socio-economics portion of ISH11 (and not reviewed in any detail in this Annex). Therefore a series of MRC and other reports of this nature are not included in the literature review for this Annex (for example see BDP 2011a; Hall and Leebouapao, 2005; ICEM(2010); Laplante, 2005). Interested readers should instead await the forthcoming ISH02 report.

- At the other end of the scale from the microeconomics of hydropower projects themselves are the macroeconomic parameters that can be used to track a number of key national and regional indicators of economic development. Macroeconomic data indicators are not necessarily causally linked to a particular hydropower development, as with the more localized socio-economic indicators, but are selected in order to portray development trends over time, trends that should reveal positive attributes over time as sustainable hydropower projects are developed.

As with the other ISH11 disciplines, the socio-economics work considers not only what type of information is collected, but from where, by what method, when, how it is managed including QA/QC, and how is it used to inform important hydropower planning and management questions. ISH11 is focussed on the basin-scale information that would be centralised and shared by the MRC, but is mindful that this same information can be valuable at the project-specific scale.

The Annex begins with a review of best practice on socio-economic monitoring programmes and then proceeds to review the available monitoring programmes and information for the Mekong. Given the relative underdevelopment of socio-economics information within the MRC, particularly with respect to hydropower, the following section provides a review of the proposed framework for socio-economic indicators that are currently being assessed within the MRC through a number of related projects and efforts. Within this full set of indicators are identified those of hydropower relevance, or those of interest to ISH11. The improvement proposals set forth under ISH11 in the Main Phase 2 Report are then described along with a brief summary of other related on going MRC projects by other MRC programmes.

2 Best Practice for Socio-economic Monitoring Programmes

2.1 Social Sustainability

Sustainable hydropower relates to the concept of social sustainability, which is relevant in the context of MRC's vision of "An economically prosperous, socially just and environmentally sound Mekong River Basin", and MRC's mission "To promote and coordinate sustainable management and development of water and related resources for the countries' mutual benefit and the people's well-being".

Though social sustainability is a much debated and difficult concept, a working definition has been suggested in the following (Colantonio 2007):

"...social sustainability refers to the personal and societal assets, rules and processes that empower individuals and communities to participate in the long term and fair achievement of adequate and economically achievable standards of life based on self-expressed needs and aspirations within the physical boundaries of places and the planet as a whole. At a more practical level, social sustainability stems from improvements in thematic areas of the social realm of individuals and societies, ranging from capacity building and skills development to environmental and spatial inequalities..."

Social sustainability can be understood in several dimensions: social, socio-institutional, socio-economic, and socio-environmental, within which there are many thematic areas as listed in Table 1.

Table 1 – Thematic Areas of the Social Sustainability Concept

Social 1. Access to resources 2. Community needs (e.g. are communities able to articulate their needs?) 3. Conflicts mitigation 4. Cultural promotion 5. Education 6. Elderly and aging 7. Enabling knowledge management 8. Freedom 9. Gender equity 10. Happiness 11. Health 12. Identity of the community/civic pride 13. Image transformation and neighborhood perceptions 14. Integration of newcomers (especially foreign in-migrants) and residents 15. Leadership 16. Justice and equality 17. Leisure and sport facilities 18. Less able people 19. Population change 20. Poverty eradication 21. Quality of Life 22. Security and Crime 23. Skills development 24. Social diversity and multiculturalism 25. Well being	Socio-institutional 26. Capacity Building 27. Participation and empowerment 28. Trust, voluntary organizations and local networks (also known as Social Capital)
	Socio-economic 29. Economic security 30. Employment 31. Informal activities/economy 32. Partnership and collaboration
	Socio-environmental 33. Inclusive design 34. Infrastructures 35. Environmental Health 36. Housing (quality and tenure mix) 37. Transport 38. Spatial/environmental inequalities

Source: Colantonio (2007)

Thus, the concept of social sustainability incorporates traditional social objectives and policy areas such as equity and health with issues concerning participation, needs, social capital, the economy, the environment, and more recently, with the notions of happiness, well-being and quality of life.

The concept of social development is also relevant to revisit here. Social development can be defined as the process of moving towards social sustainability. The World Bank defines social development as a process towards:

- Inclusive institutions that promote equal access to opportunities, enabling everyone to contribute to social and economic progress and share in its rewards;
- Cohesive societies that enable women and men to work together to address common needs, overcome constraints and consider diverse interests; and
- Accountable institutions that are transparent and respond to the public interest in an effective, efficient and fair way.

From this brief exposition of the very broad knowledge field of social sustainability, it will be clear that the social and socio-economic parameters aim to focus on those parameters that are most directly related to hydropower and are the most relevant in the context of the LMB.

2.2 Economic Sustainability

Sustainable economic development is generally defined as development that meets the needs of the present without compromising the ability of future generations to meet their needs (WCED, 1987). Income reflects earnings from capital. Statements about meeting needs in the present and the future thus ultimately relate to the stock of capital held by a society or region. Capital takes many forms including human, physical, social, natural, financial and technological. Development implies an ability to increasingly meet societal needs and, thus, implies a growth in capital. The development of large hydropower projects represents a singular challenge to our understanding of sustainable economic development. This, as large hydropower projects alter the land- and hydro-scape and therefore natural capital in pervasive and irreversible ways. This alteration shifts a nation's income from a reliance on the provisioning, regulating, supporting, and cultural ecosystem goods and services produced by so-called "green infrastructure" to a reliance on the provisioning services produced by "built" infrastructure (as per the Millennium Ecosystem Assessment 2005).

Competing ideas exist on what constitutes long run economic sustainability. These are referred to as "weak" and "strong" sustainability and are based on differing perspectives as to what extent one form of capital may substitute for another (Pearce et al., 1990). For example, to what extent can physical capital (a dam) substitute for natural capital (for example watershed function)? Technology is critical, as technological change is what enables societies to increase production of items that society needs from a limited resource base. Weak sustainability maintains that what is important is that the total stock of capital grows. If this occurs then the prospects of meeting the needs of future generations are good. Strong sustainability maintains that there is limited substitutability between types of capital. In particular, that there is limited substitutability between social and natural capital and "man-made" capital such as physical, financial and technological capital.

While there are many unresolved theoretical questions the discussion highlights the presumption that sustainable hydropower development should, at a minimum be a positive capital enhancing endeavour that sustains and grows income over the long term. This issue can be examined at different levels. At the project level, economic analysis of the costs and benefits of projects can be used to assess if a project yields net economic benefits to the national economy, as opposed to yielding simply positive financial returns to the project proponent (Aylward et al., 2001). This involves incorporating the local socio-economic impacts of hydropower facilities in terms of changes

in natural, human and social capital and the income/well-being derived from them. Inevitably, such an effort incorporates social and not just economic indicators.

At the level of the macroeconomy the consequences of many such decisions can be assessed in terms of whether national capital and income are growing, and whether the overall macroeconomy is stable and well balanced. With respect to natural capital, various proposals have been made to incorporate this capital directly into the national accounts or to maintain “satellite” accounts that track the stock of capital but in physical not monetary units (UNSD, 1993). Initial efforts to apply this approach to water have been undertaken, but largely in arid areas where water scarcity drives the perception of value (Lange and Hassan, 2006). The utility of these capital accounts, however, has yet to be tested with reference to dams, and particularly in the tropics. In the meantime efforts to assess sustainability continue to rely on macroeconomic indicators of growth combined with measures of environmental and social sustainability. In the case of the MRC and dams on the LMB the improvement proposal on macroeconomics focuses on the latter, but in doing so may lay the groundwork for future efforts to examine long term issues of the fungibility of capital, long-term income growth and economic sustainability.

2.3 Monitoring of socio-economic impacts from hydropower

It should be noted that in addition to the frameworks presented in this section the ISH11 Inception Report presents other possible approaches to structuring the economic and social monitoring and data analysis; including the Pressure, Condition, Response model recommended by OECD, and the more detailed Drivers, Pressures, States, Impacts, Responses (DPSIR) approach.

The Hydropower Sustainability Assessment Protocol (IHA, 2010) is a key reference document for ISH11, as it presents a comprehensive set of sustainability topics and criteria agreed through international processes to be important to hydropower. It consists of sustainability assessment tools appropriate to each of the four key life cycle stages of hydropower projects: Early Stage, Preparation, Implementation, and Operation.

The Protocol applies an integrative perspective with a broad categorisation into environmental, social, technical and economic/financial perspectives, while recognising that individual topics are not always neatly labelled as a particular perspective. Some topics are integrative in nature, such as governance for example. In the social and economic dimensions, household economics and livelihoods are integrative in the sense they extend into both dimensions (i.e. socio-economics), and into the environment dimension as well.

Two topics, namely Project Benefits and Project-Affected Communities & Livelihoods, are considered particularly pertinent to socio-economic considerations. The parameters included in those two topics are included in the proposed parameters for ISH11 baseline monitoring. For ease of reference they are presented in Table 2.

Table 2 – Hydropower Sustainability Protocol Guidance Notes, Examples of Socio-economic Parameters

Guidance notes from topic: Project benefits	Guidance notes from topic: Project-Affected Communities & Livelihoods*	Relevant socio-economic parameters (mainly at household level)
Training, capacity building and local employment	Lowering of living standards, loss of income sources or means of livelihoods as a result of (i) acquisition of land, (ii) changes in land use or access to land, (iii) restriction on land use or access to natural resources including water resources, legally designated parks, protected areas or restricted access areas such as reservoir catchments. Loss or constraints on livelihoods: loss of paddy lands, of home gardens, of riverbank gardens; loss of ownership, access to or use of sacred sites, community forest, or other natural resources, etc. impacts on cultural practices;	Employment/occupation Consumption, Income, Savings, Health, Education, training Nutrition (food security), Housing. HH landownership HH access and use rights to commons: Land, incl. river banks, Aquatic resources incl. wetlands, and reservoirs etc.
Support for other water uses such as irrigation, navigation, flood/drought control, aquaculture, leisure		
Non-monetary entitlements to enhance resource access – project affected communities receive enhanced local access to natural resources		
Infrastructure such as bridges, access roads, boat ramps	Loss of assets or loss of access to assets	Access to transport Time to reach nearest market town/hospital/health station
Improved services such as for health and education	Changes in environment leading to health concerns or impacts on livelihoods.	Access to health services, educational services
Increased water availability for industrial and municipal water supply		Access to clean water and sanitation
Benefits through integrated water resource management		Access to and use of irrigation
Equitable access to electricity services – project affected communities are among the first to be able to access the benefits of electricity services.		Access to and price of electricity
Revenue sharing – project affected communities share the direct monetary benefits of hydropower according to a formula and approach defined in regulations		HH and Community level: Direct cash transfers

*Resettlement and Indigenous Peoples are sub-sets of this topic, and so both physical and economic displacement considerations are included

Further, for the analysis of socio-economic benefits and impacts of hydropower, the OECD/DAC 'Ex Ante Poverty Impact Assessment' format can be used as reference (OECD, 2007). This framework is a simpler version of the very comprehensive 'Poverty and Social Impact Assessment (PSIA)' framework and tools developed and compiled by The World Bank (2003).

The 'Ex Ante Poverty Impact Assessment' framework is set in the context of results chains as used in impact analysis and assessments. The components of the results chain are (OECD, 2002):

- Inputs: The financial, human, and material resources used for the development intervention.
- Outputs: The products, capital goods and services which result from a development intervention; may also include changes resulting from the intervention which are relevant to the achievement of outcomes.
- Outcomes: The likely or achieved short-term and medium-term effects of an intervention's outputs.
- Impacts: Positive and negative, primary and secondary long-term effects produced by a development intervention, directly or indirectly, intended or unintended.
- Results chain: The causal sequence for a development intervention that stipulates the necessary sequence to achieve desired objectives beginning with inputs, moving through activities and outputs, and culminating in outcomes, impacts, and feedback.

The OECD/DAC framework is relatively simple, which enhances its usefulness in the context of impact assessment as part of hydropower planning and long-term monitoring. The format has the advantage that it plays directly into Social Impact Assessment methods that will be undertaken by government agencies and/or private companies as part of hydropower planning.

Table 3 – Ex Ante Poverty Impact Assessment generic reporting table

Transmission channel			Results by Transmission Channel Categories			
Transmission Channels	Details	Details of changes due to hydro-power	Short Term (+/-)	Medium Term (+/-)	Details	Risks
Prices Employment	Production					
	Consumption					
	Wages					
Tax and Transfers	Taxes					
	Subsidies and transfers					
	Private remittances					
Access to goods and services	Electricity					
	Roads					
Authority	Formal organizations					
	Informal relations					
Assets	Physical					
	Natural					
	Human					
	Social					
	Financial					

Example of scores: ++ Very positive; + Positive; 0 Not relevant; - Negative; -- Very negative

The framework uses the concept of 'transmission channels' from intervention to impact (Table 3). The impacts can be given values based on qualitative assessments. For analysis of 'assets', the format uses the concepts of the 'five capitals' from the sustainable livelihoods approach.

To link the socio-economic parameters with this analytical structure it would a possibility to 'tag' the different parameters with reference to their place in the table. However, it is not proposed to apply the structure as the overall framework for the organization of the socio-economic database as there are other considerations in this respect as discussed elsewhere in this section. In sum, there are a number of different frameworks for organising socio-economic information.

2.4 Important Considerations for Best Practice Monitoring

With the planning and construction horizons of large hydropower infrastructures in the Mekong, the system for socio-economic monitoring with data collection, data management, and making data accessible, must be able to function over many years. It must be able to produce data that are comparable over time and between countries even in the face of inevitable institutional changes in the countries, changes in MRC itself, and changes in the level of funding for this purpose. Thus a key consideration for the monitoring system is how it is to be sustained over time. This is a challenging task that requires building a strong institutional base and institutional linkages for the system, and ensuring resources for its management, operation and maintenance.

With regard to macroeconomic and other national statistical data these are routinely collected by the national agencies in each of the LMB countries. These are collected for many different purposes of which MRC information needs is just one. MRC activities must therefore adapt to the procedures, timelines and regulations that govern these activities in each countries. Regional and global efforts and standardisation and harmonisation are likewise driven by concerns other than those of the MRC, but can result in the provision of information useful to the MRC needs for hydropower relevant information. National level statistics available from international institutions to which the LMB member countries belong, such as the Asian Development Bank, the United Nations Development Programme, the World Bank, and the International Monetary Fund are useful as they are subject to the standardisation and harmonisation procedures of these international entities.

The system for monitoring hydropower relevant socio-economic data need the to consider the following (Kusek 2004).

Ownership: Stakeholder ownership at every level is critical; if there is no ownership at some levels stakeholders will not be willing to invest time and resources in the system and it will degenerate. Ownership is most effectively achieved through primarily financial, subsidiary in-kind, or human resource contributions of the involved parties. As this is planned to occur some years into the future, the on going work on establishing the MRC socio-economic database focuses on building ownership through engaging NMCs and national statistical agencies directly, and using the opportunity for further international collaboration between the statistical agencies as an incentive for participating. At the establishment phase MRC is seen as the owner of the socio-economic database, and this may continue for some time. Within MRC there is a need for identifying the longer-term 'primary custodian' of the socio-economic database and allocate the necessary resources. The Scoping Report for the Establishment of the Socio-economic Database (MRC December 2013) outlines options for institutional anchoring in MRC and for oversight arrangements.

Management: It must be clear who, how and where the system will be managed. It is essential to agree on a data management system that will ensure data quality, data comparability, and routine updating. Further data users must know which data are available. The socio-economic data management system is set in the context of decentralization of MRC core functions. It is proposed to apply a DevInfo software platform, which can be managed centrally in MRC while having national implementations that can be linked to existing databases in the countries. Whether NMCs will establish socio-economic database teams operating national databases, or a leaner, more centralized setup will be used is planned to be worked out in 2014. Further, as mentioned, it is proposed to establish a Socio-economic Expert Technical Working Group in MRC comprising national statistical experts and socio-economists from the MRC programmes, as well as socio-economists from the NMCs. This working group would oversee the management, operation, maintenance and updating of the socio-economic database.

Maintenance: The monitoring system will require periodical rebuilding, renewal and strengthening. As in the case of data management, maintenance of the monitoring data system requires incentives and sufficient financial, human and technical resources for the involved organizations: NMCs, national statistical agencies and MRC. Individual and organizational responsibilities must be clear

for all involved. New advances in data management and technology should also be taken into account.

Credibility: Especially in the transboundary context of the LMB, credibility of data is essential for the monitoring system to fulfil its purpose. If people think the data and information is motivated or tainted by political or special interests they will not trust and use it. The socio-economic database will contain only official statistics from the member countries. Credibility is thereby vested in the national government agencies. For SIMVA data, credibility is sought through the extensive consultation process with NMCs and national stakeholders.

3 Literature Review and State of Knowledge

This section provides a review of available literature and state of the knowledge with regard to socio-economic baseline information with hydropower relevance, focussing on socio-economic monitoring activities undertaken by MRC and information held more generally by the MRC. A more complete review of the literature is included in the Annotated Bibliography, which is included as Attachment 1 to this annex. Table 4 provides a summary of socio-economics information currently held and/or coordinated by the MRC. A few of the more important areas of past or current effort are described in the sub-sections below.

Table 4 – MRC Currently-Held Socio-Economics information

MRC-Held Historical Information	<p>Earliest is the Social Atlas of the LMB (2003), containing data collected in 1998 for Cambodia, 1995 for Lao PDR, 2000 for Thailand, and 1999 for Viet Nam. Differing definitions and methodologies were used, making it difficult to compare indicators across the four countries.</p> <p>Latest are national census data being provided for the BDP socio-economics database.</p>
MRC Monitoring Programme Name	<p>Social Impact Monitoring & Vulnerability Assessment (SIMVA), managed by EP.</p> <p>BDP Socio Economic Database 2013 (in progress) sourced from National Statistics agencies and other national sample surveys.</p>
Locations	<p>SIMVA: 2011 survey covered 135 villages and 2,720 households within 15 km on each side of the Lower Mekong River, increasing to 40 km at the floodplains. 2014 SIMVA to increase sample size to ~5,000 households, and reduce included area around flooded areas to 15 km.</p> <p>Other: National census data is country-wide, and sometimes commune or district level.</p>
Timing/Frequency	<p>SIMVA: Pilot survey in 2009, baseline survey in 2011 and next survey planned for 2014. Planned to be recurrent bi-yearly, depending on budget and scope.</p> <p>Other: National census data is collected 5 yearly and other sample surveys more frequent.</p>
Parameters	<p>SIMVA: Quantitative household survey; for 2014 planned qualitative data collection from key informants and focus groups; secondary data collection; GIS mapping of corridor.</p> <p>Other: National census and survey data collection covers a very broad range.</p>
Analyses	<p>SIMVA: 63 indicators covering baseline vulnerability; dependence on fish, OAAs, and irrigation and riverbank cultivation; resilience; shocks and trends; and climate change. 2014 survey planned to apply a sample that is representative of zones and sub-zones, which will enhance analytical power.</p>
Information Management	<p>SIMVA: Collected data are quality checked and entered at the national level. A dedicated specialist in EP manages SIMVA. Consultants carry out the analysis and report.</p> <p>Other: BDP Socio Economic database currently under design and development, working through national statistical officers from the Member Countries.</p>
Information End-Uses	<p>MRC Technical Papers.</p>

3.1 Basin-wide Socio-economic Data

As described in the ISH11 Phase I report, the basin-wide socio-economic data that are available in MRC at the moment comprise the following: ‘Social Atlas of the Lower Mekong Basin, March 2003’ and ‘BDP Planning Atlas of the Lower Mekong Basin, 2011’.

Table 5 summarizes these data sets and the available data for each country.

The Socio-economic data for the Social Atlas, 2003 were collected in Cambodia, Lao PDR, Thailand, and Viet Nam at different times: 1998 in Cambodia, 1995 in Lao PDR, 2000 in Thailand, and 1999 in Viet Nam. As the countries used different definitions for some variables it was in many cases impossible to generate a dataset for an indicator that was perfectly comparable across the four countries. The same problem also limited the number of basin-wide variables that could be included in the BDP Planning Atlas of 2011.

Table 5 – Available Official Socio-economic Data

Socio-economics	Comments
<p>Whole LMB</p> <p>Oldest MRC data: Social Atlas of the Lower Mekong Basin. March 2003</p> <p>Most recent MRC data: BDP Planning Atlas of the Lower Mekong Basin, 2011</p>	<p>The Social Atlas 2003 was based on data collected in Cambodia, Lao PDR, Thailand, and Viet Nam at different times: 1998 for Cambodia, 1995 for Lao PDR, 2000 for Thailand, and 1999 for Viet Nam. Differing definitions and methodologies used: therefore often impossible to generate a dataset comparable across the four countries. There were also important differences in the definitions of indicators.</p> <p>BDP Planning Atlas, 2011, presents a broad range of socio-economic data, which includes a chapter on Social Attributes. The data comprise a number of basic socio-economic parameters obtained by BDP from line agencies in the four countries and processed under SIMVA in 2010 (listed below). Because the data were in different formats, and parameters were for different levels i.e., by province or by country SIMVA focused on only 12 parameters as follows:</p> <ol style="list-style-type: none"> 1. Poverty rate; 2. Infant mortality rate, 3. % Child malnutrition, 4. Unemployment rate, 5. Proportion of population finished lower secondary school, 6. Proportion of employment in agriculture sector, 7. Proportion of population with access to electricity, 8. Proportion of population with access to sanitation, 9. Proportion of population with access to safe water. 10. Total fertility rate, 11. Household size, 12. Dependency ratio
<p>Lao PDR</p> <p>Most recent MRC data: LECS IV 2007/08</p>	<p>LECSIV: sample survey, acquired by BDP for Social Assessment of Scenarios. Paper copy of the ‘Geography of Poverty Atlas: The Geography of Poverty and Inequality in the Lao PDR’, based on Lao Expenditure and Consumption Survey (LECSIII) (NSC, 2004) carried out in 2002/03, and the 2005. Population and Housing Census, 2006.</p>
<p>Cambodia</p> <p>Most recent MRC data: Census 2007/08, Commune database 2007/08</p>	<p>Acquired by BDP for Social Assessment of Scenarios. Contains a very broad range of socio-economic variables at commune level.</p>
<p>Thailand</p> <p>Most recent MRC data: Social Atlas of the Lower Mekong Basin. March 2003</p>	<p>Thailand did not provide any district level socio-economic data to BDP in 2010.</p> <p>Data for the BDP Atlas are from the Statistical Yearbook.</p>
<p>Vietnam</p> <p>Most recent MRC data: 2009 Census; Vietnam Household Living Standards Survey (VHLSS) 2010</p>	<p>At District and Province level. Acquired by BDP for Social Assessment of Scenarios</p>

3.2 Socio-economic Monitoring Data: SIMVA

The Social Impact Monitoring and Vulnerability Assessment (SIMVA) is MRCS's tool for obtaining longitudinal information on the social conditions of the LMB, especially along the mainstream, where use and dependence on aquatic resources is most visible. The Environment Programme under MRCS has carried out SIMVA since 2004 and has completed three phases: Phase 1 was an extensive literature review conducted from 2004-2006; Phase 2 was a preliminary or pilot survey to determine the validity of indicators and research tools, from 2008-2009; Phase 3 was a baseline study to generate baseline data on socio-economic, dependence on water resources, resilience, shocks & trends, and climate change associated vulnerabilities conducted from 2011-2012.

The social impact monitoring has the objective of describing how changes in the availability of aquatic resources affect social vulnerability over time, and the vulnerability assessment describes how vulnerabilities in food and livelihoods are related to the availability of these resources. In 2009 they were combined into a single data collection and analytical process. In the Phase 2 pilot survey the sample size of 1360 households in a 15 km corridor along the mainstream and a 40 km buffer zone around flooded areas along the same and Tonle Sap, was considered sufficient to suggest conclusions about the social situation in those specific sites. Phase 3 was a more comprehensive sampling of 2720 households in 136 villages within the same mainstream and flooded area corridor. This time additional indicators to reflect vulnerability to climate change were included. SIMVA Phase 3 is referred to as the baseline study from which indicators can be monitored on a regular periodic basis. Figure 1 shows the planned schedule that will ensure data points that eventually will provide the basis for identifying trends.

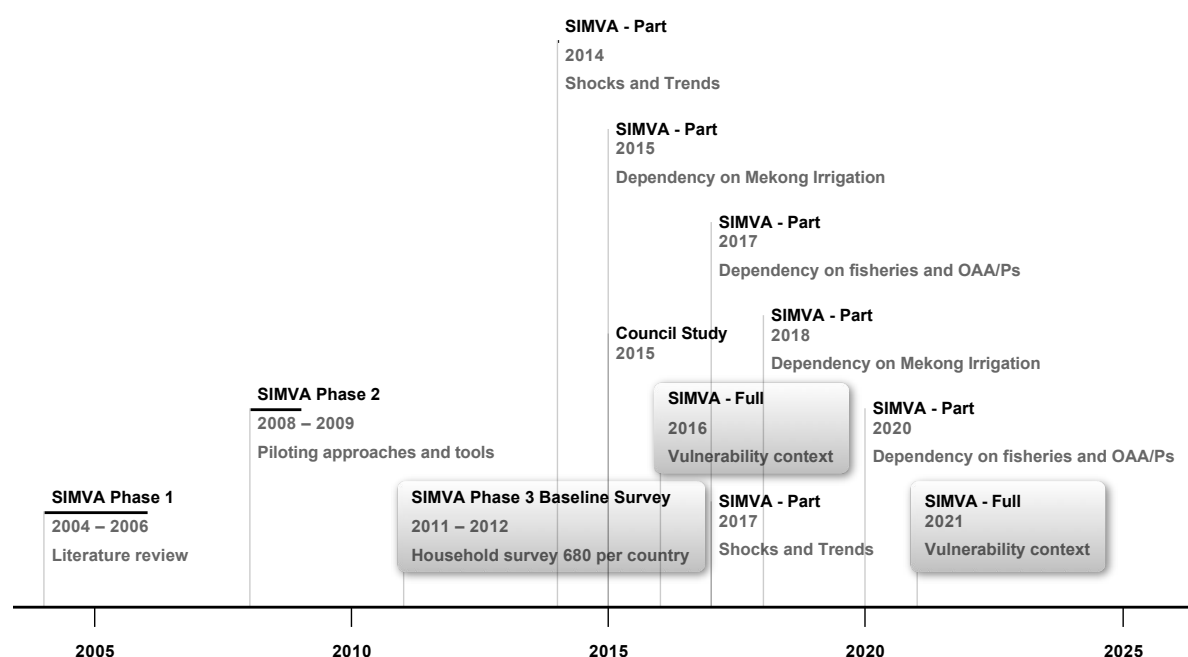


Figure 1 – SIMVA Timeline

SIMVA repeated long-term data collection is expected to follow this schedule:

- Vulnerability context – 5 to 10 years
- Dependency on fish – 3 years
- Dependency on OAAs – 3 years
- Dependency on Mekong irrigation – 3 years
- Shocks and trends – yearly (originally intended, but probably every 3 years)

As SIMVA focuses on socio-ecological functionality, the mainstream corridor has been divided into social-ecological systems identified through earlier work carried out by WWF (with MRC support) in 2006. These use a classification framework for sub-basins and streams based on ecological functionality, which in turn is based on hydro-geomorphic characteristics. A ‘social-ecological system’ (SES) is defined as ‘an integrated system of ecosystems and human society with reciprocal feedback and interdependence’. The concept emphasizes the ‘humans-in-nature’ perspective (Resilience Alliance 2007).

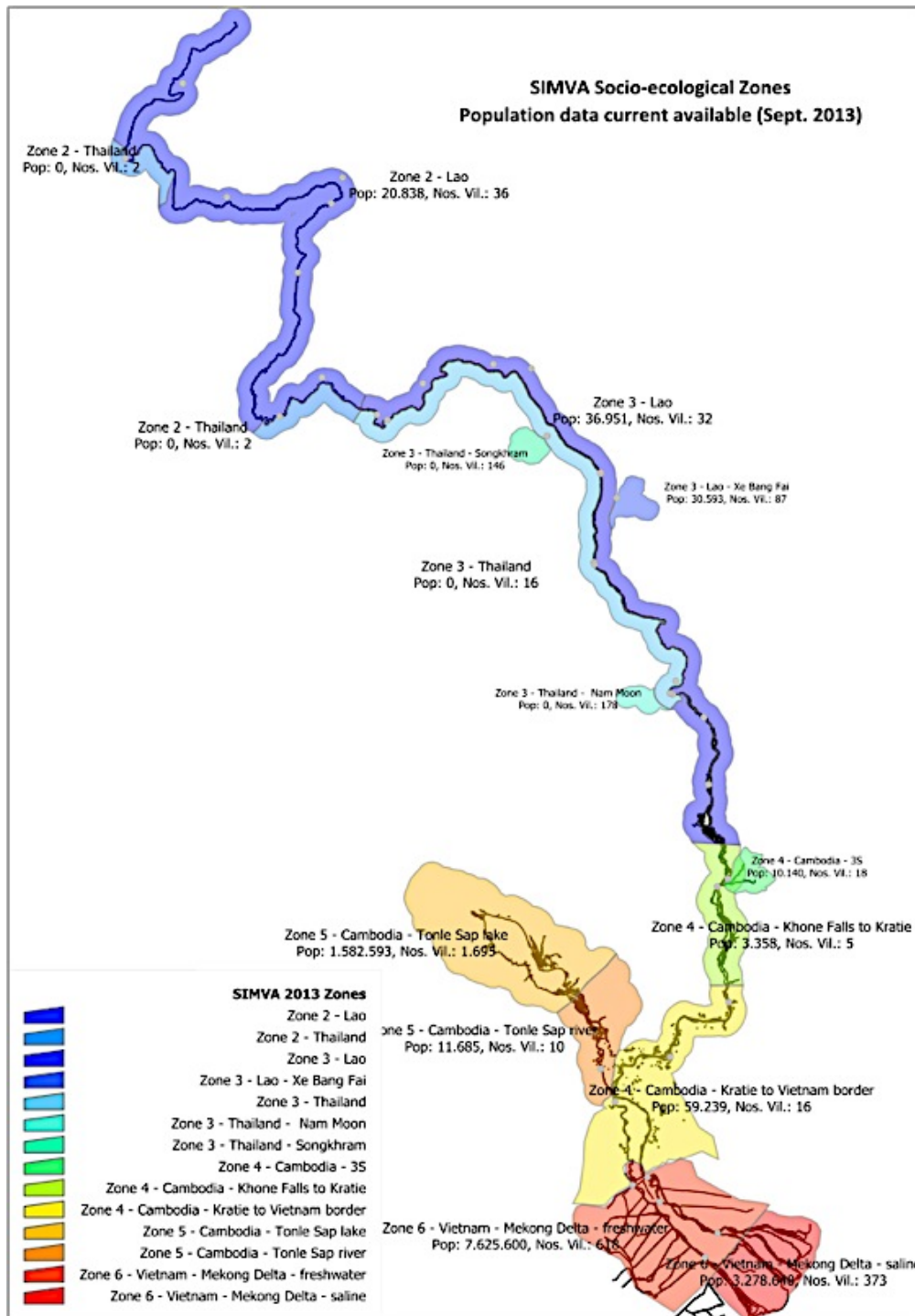


Figure 2 – SIMVA Socio-ecological Zones and Sub-zones for 2014

The categories considered are:

- System type (e.g., headwater vs. pass-through watershed, small vs. large streams, floodplain type)
- Elevation (and derivatives, e.g., slope)
- Geology
- Vegetation
- Hydrology (e.g., surface runoff, river discharge)
- Stream network characteristics (e.g., river density, sinuosity)

The SIMVA 2014 is under preparation, this time with a focus on 'shocks and trends'.

3.3 Macroeconomic Data

MRC programmes do not regularly collect macroeconomic information from Member Countries for presentation or analysis. Occasional projects do however deploy macroeconomic information for their various purposes. For example the Economics Baseline Assessment Working Paper of the 2010 Strategic Environmental Assessment provides a set of graphs and discussions with respect to macroeconomic variables (ICEM 2010). For general macroeconomic conditions and trends the study examines the following information:

- Average gross domestic product (GDP) growth for Member Countries and the region for 1994 to 2008
- Sectoral sources of GDP for Member Countries and the region for 1994 to 2007
- Changes in GDP/capita, household consumption expenditure/capita for 1998 to 2008
- Population and urban population
- Projections of real economic growth rates and GDP through 2030

The data comes from various World Bank and Asian Development Bank sources.

The Working Paper goes on to examine two macroeconomic impacts of hydropower development in the region: multiplier effects of foreign direct investment (FDI) and changes in the relative terms of trade between sectors/counties and debt default risk in Lao PDR. This effort involves developing information for Lao PDR, and to a lesser extent Cambodia, on:

- National accounts for 2003 to 2008 including exports, imports, current account balance, reserves, and capital account including FDI and FDI as proportion of GDP
- industry distribution of FDI for various years from 1988 to 2008
- Composition of exports 1998-2006
- FDI flows to LMB countries and as a percent of GDP 1996 to 2007
- Investment in LMB hydropower 1990 to 2009, and projected to 2016 (based on the hydropower product database)
- Contribution of mining and hydropower to growth in Lao PDR, 2000 to 2007

And finally, later in the ICEM working paper sections on poverty and inequality report on poverty head counts and Gini indexes for LMB countries. While this information is useful and can be linked, even if indirectly to hydropower, such efforts are project-based and occasional and therefore do not provide MRC with a baseline set of information for which to draw on for routine or special project use.

3.4 State of Knowledge regarding Hydropower-Relevant Socio-Economics

There is a wealth of available socio-economic data from the member countries, and thus also for the geographical areas in the LMB. However, identifying, sorting, compiling and processing the data that pertains to the LMB so they are comparable between countries as to give a comprehensive picture of the socio-economic conditions in the basin as such, has been and is a challenging job, as described in this report. More general descriptions of socio-economic conditions in the whole basin, in the member countries, or in larger regions within the countries, are provided in the Social Atlas of 2003, in the State of Basin report (MRC 2010), and in the BDP Planning Atlas (MRC 2011b). However, the available hydropower relevant socio-economic data, with the required level of spatial detail is fragmented.

The State of the Basin report 2010 includes a section on the economy of the basin, including brief sections on growth, trade and inflation and on regional cooperation; and a brief section on population, economy and social indicators. Included is the below table of main socio-economic indicators. The sources for the table are also presented to give a sense of the type of data that were available at that time; notice that only three sources are national statistics.

Table 6 – MRC 2010 State of the Basin, Socio-economic Indicators

Indicators	Cambodia	Lao PDR	Thailand	Viet Nam
Total area (km ²)	181,035	236,800	513,120	332,000
Total LMB area (km ²) ¹	156,435	206,620	203,060	34,373 (Mekong Delta) 32,400 (Central Highlands)
Population 2007 (million) ²	14.4	5.9	63.9	87.4
LMB population 2007 (million) ¹	13.0	5.2	23.1	18.7
Number of provinces	25	17	75	58
Number of provinces in LMB	23	17	25	20
Composition of ethnic groups (% of total) ^{3, 4}	Khmer (90) Vietnamese (5) Chinese (1) Mon-Khmer (2) others (2)	Lao (55) Khmu (11) Hmong (8) others (26)	Thai (75), Chinese (14) others (11)	Kinh (Viet) (86.2), Tay (1.9), Tai (1.7), Muong (1.5), Khmer (1.4), Hoa (1.1), Nun (1.1), Hmong (1), others (4.1)
Languages	Khmer	Lao	Thai	Vietnamese
Religions	Buddhism	Buddhism	Buddhism	Buddhism
Average annual population growth rate (%; 2007) ⁶	1.9	2.1	0.8	1.2
Population density (people per km ² , 2007) ²	80	25	125	265
Rural population (% of total population, 2007) ⁸	78	69	68* ⁷	72*
Rural population density (people per km ² of arable land, 2005) ^{7, 5}	303	450	323 (1999)	930
Access to clean drinking water (% of population, 2006) ⁹	65	60	98	92
Improved sanitation (% of population with access to, 2006) ²	28	56 ¹⁵	96	65
GDP per capita (US\$, 2006) ¹⁴	648	674	3000	900
Proportion of population below national poverty line (%) ²	35 (2004)	33 (2003)	10 (2006) ¹⁶	16 (2006)
Life expectancy at birth (years, 2007) ²	59	64	71	74
Infant mortality (rate per 1000 live birth, 2006) ²	65	59	7	15

Malnutrition rate (% , 2007) ¹⁰	28	36 (2000)	7	20
Global hunger index level (2009) ¹¹	Alarming/high vulnerability	Serious/ high vulnerability	-	Serious/high vulnerability
Net primary school enrolment rate (% , 2007) ⁹	89	86	94	98
Adult literacy rate (% , 2007) ^{2, 13}	76	73	94	90
Freshwater withdrawal for agriculture (% , 2002) ²	98	90	95	68.1
World corruption ranking (2007) ^{12, **}	134	140	67	98

Sources:

1. MRC BDP database
2. UNESCAP 2008. Statistical Year Book for Asia and the Pacific 2008
3. CIA World Fact Book 2008. Central Intelligence Agency, United State of America
<https://www.cia.gov/library/publications/the-world-factbook/geos/cb.html>
4. Viet Nam Population Census 1999
5. GMS Atlas of the Environment, GMS Environment Operations Centre, accessible website: www.gms-eoc.org/Country/Country.aspx
6. ADB 2008. Key Indicator for Asia and the Pacific 2008 (39th Edition): Special Chapter Comparing Poverty across Countries: The Role of Purchasing Power Parities
7. International Fund for Agricultural Development (IFAD). Rural Poverty Portal Statistic and World Development Indicators
8. Population and Housing Censuses of Thailand in FAO 2005: Rural population ageing and farm structure in Thailand
9. UN MDG Indicators online, <http://mdgs.un.org/mdg/SeriesDetail.aspx?srid=665>
10. The World Bank. An online atlas of the MDG: <http://devdata.worldbank.org/atlas-mdg/>
11. International Food Policy Research Institute (2009): 2009 Global Hunger Index: the Challenge of Hunger: focus on Financial Crisis and Gender Inequality
12. The World Democracy Audit (2007): 2007 Corruption Ranking
13. UNDP 2009 Human Development Report, Viet Nam Country Fact Sheet
14. World Bank database 2009
15. UNICEF and WHO 2008. Progress on drinking water and sanitation
16. NSO 2006. National Statistical Office, Thailand

Further the State of Basin report includes sections on indices of human development from 1990-2007; progress towards the MDGs by country; characteristics of poverty also by country, mainly based on sources from WHO, UN, WFP, IFAD, and the Study of fish Consumption by Hortle 2007, with brief descriptions of the areas of Thailand and Vietnam that are in the LMB; water resources related livelihoods and food security, based on SIMVA 2010 and the Social Atlas of 2003. Citing SIMVA 2010, the State of Basin Report highlight the importance of water related occupations in the LMB (farming, fishing, collection of other aquatic animals, or edible plants, aquaculture, use of mini-hydro, fish processing, fish marketing, marketing of other water-dependent products, net making/ repairing, boat making and/or repairing and farm labour).

The BDP Planning Atlas of the Lower Mekong Basin presents the following data in the section called 'Social Attributes': Population, Population Density, Population Growth, Dependency Ratio, Gender Ratio, Household Size, Female Head of Household, Primary School Enrolment, Secondary School Enrolment, Access to Improved Water, Access to Sanitation, Access to Electricity (MRC 2011b). These data are from a variety of sources from different years. The sources of these data are mainly national statistics from the latest census.

The BDP Social Assessment of Basin-wide Scenarios contains an analysis of social impacts from hydropower development as it was defined in a number of scenarios (MRC 2011a). The assessed impacts were mainly on fisheries and collection of aquatic products as these are the most direct impacts. This assessment was based on a detailed analysis of the available national statistical data at that time. The assessment focused on the impacts arising principally from hydropower dam construction, flow regime change and depletion of capture fisheries, taking into account also the outcomes of the fisheries and environmental assessments. The social assessment explicitly did not assess the severity of impacts, and further, the assessment was based on current livelihoods without

considering general socio-economic development and changes that will occur regardless of hydropower. The assessment dimensions and key indicators used are summarized in the table below.

Table 7 – BDP Assessment of Social Impacts of Hydropower Development

Dimensions	Definition	Key indicators
Dependency	The proportion of the population for whom river resources are important for upholding livelihoods, health and well-being.	% Part-time fishers % Full-time fishers % Households (HHs) engaged in collection OAA/P Consumption of fish/fish products
Exposure	The state of being exposed to contact with something - here defined by location viz. hydropower dams and rivers that are affected by dam construction.	Location in areas directly affected by hydropower dams – upstream/downstream Location on floodplains Proximity to rivers, tributaries and wetlands connected to the main river system Impacts on fish and OAA/P Increase in irrigation area Flooding risks
Sensitivity	The degree to which a system (e.g., human, environmental, biological, etc.) is affected by and responds to stimuli in proportion to their magnitude.	Dependency value/rank (percent fishers) Importance of fish and OAA for food security
Resilience	The capacity of a system (e.g., human, environmental, biological, etc.) to absorb disturbance and reorganize while undergoing change so as to still retain essentially the same function, structure, identity, and feedbacks	Poverty rate Access to social services Alternative livelihoods, incl. aquaculture Literacy rate

The assessment of social impacts analyzed the number of people exposed to changes in the river water resources and connected wetlands, and the number of people who are dependent on these resources for their livelihoods (MRC 2011a). The overall findings for LMB countries of livelihoods that would be affected by hydropower in the different scenarios are shown in the table below.

Table 8 – Vulnerability to Hydropower Development

Scenario	Nos of exposed vulnerable resource users (-000 people)			
	Lao PDR	Cambodia	Vietnam	Thailand
Upper Mekong Dams	47*		423	
Definite Future	296	62	442	46
20 year without mainstream dams	698	274	451	201
20 Year without LMB dams	781	294	770	201
20 Year without Cambodia mainstream dams	781	321	1,088	514
20 Year without Thai mainstream dams	906	1,212	1,724	259
20 Year with mainstream dams	906	1,212	1,724	514
2060 Long-term Development	1,028	1,223	1,737	514
2060 Very High Development	1,106	1,230	1,741	514

4 Gap Analysis with Respect to ISH11 Guiding Framework

4.1 Socio-Economic Information Needs

Socio-economic information is needed to provide an understanding of the social and economic conditions for, and of the positive and negative impacts of hydropower development, based on a common understanding among key stakeholders of the desired outcomes for 'sustainable hydropower'. The information is needed at various time scales: short, medium and long-term changes; and various levels: local, national, basin-wide, and even global drivers and impacts of hydropower, as in Figure 3 and 4.

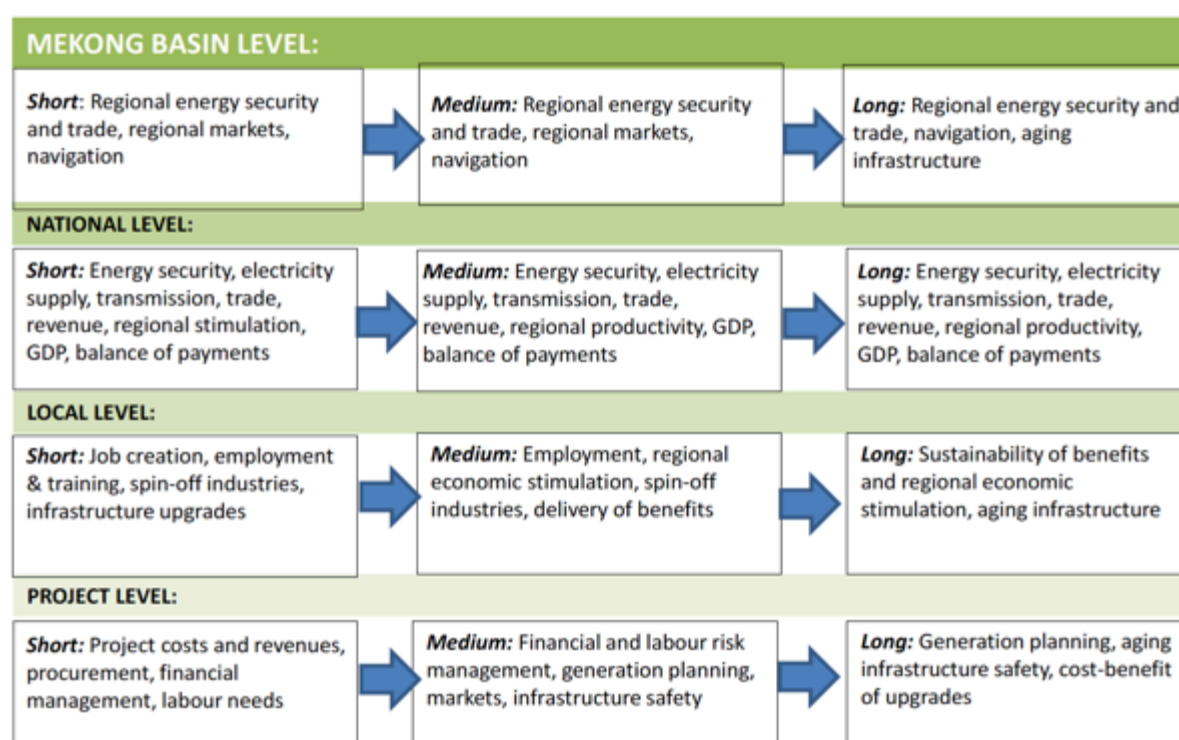


Figure 3 – Information Needs Relating to Economic Dimension

4.2 Present Status

As summarized in Section 3 the MRC has occasionally made efforts to draw together socio-economic data from the LMB. These efforts however have been limited and, with the exception of SIMVA, occasional in nature. MRC does not collect, store and make available comprehensive socio-economic data on the LMB, or with respect to hydropower *per se*. The importance of having consistent, comprehensive and updated socio-economic data available in the MRCS has been realised for some time. Key initiatives to address this are:

- 1) Establishment of a MRC socio-economic database, led by BDP; and
 - 2) The Social Impact Monitoring and Vulnerability Assessment (SIMVA), led by EP.
 - 3) The current ISH11 project to gather hydropower relevant socio-economic information, led by ISH
- In the course of implementation of the ISH11 study, from inception in November 2012 to November 2013, a number of workshops and discussions with MRC programmes have provided a platform

for ensuring that hydropower relevant socio-economic data will be included in MRC's core mechanisms for collection of socio-economic data. Consequently there are only a few gaps relating to socio-economics data that are not presently being addressed through the socio-economics database and SIMVA.

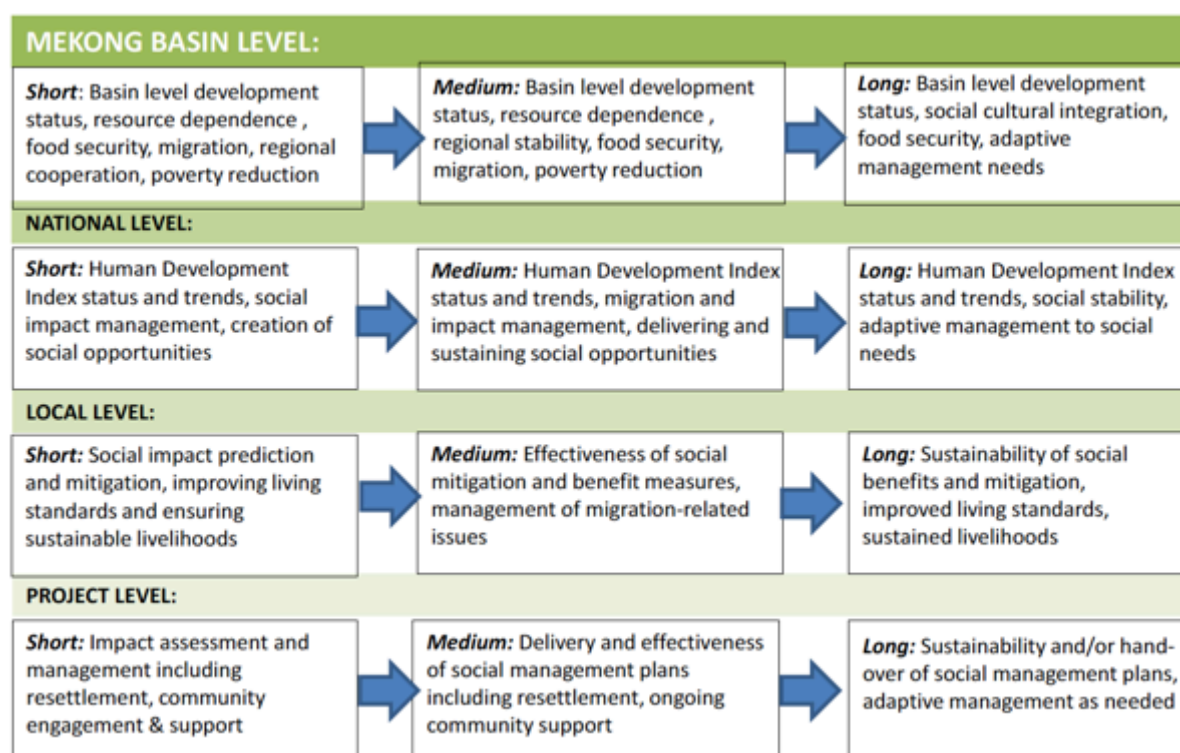


Figure 4 - Information Needs Relating to Social Dimension

The BDP project to establish a socio-economic database aims to provide easy access to good quality official socio-economic data in a sustainable manner. The work began in April 2013, and has progressed with the establishment of a team of national statistical experts from the statistical agencies of each LMB country. It is planned that government agencies, private sector and other stakeholders in the Member Countries will be provided with easy access to basin-wide official social and economic statistical data. The MRC socio-economic database will be an important resource to the work of all MRC Programmes including for hydropower planning, the State of the Basin Report, scenario forecasts, impact assessments and so forth. All official socio-economic statistics for the MRC use will be contained in the database. The predefined thematic groupings of the data will be subject-specific according to their relevance for different purposes. Thematic grouping will be flexible so new thematic groupings can be added.

The following presents the analysis of status and gaps against the main components of the Guiding Framework.

4.3 Gap Analysis - Locations

For planning specific hydropower plants and monitoring socio-economic conditions and impacts from these as well as cumulative impacts from cascades of hydropower plants, the socio-economic data must be available from local areas such as village, commune or at least district. In general, to be useful for planning of location specific development activities and projects socio-economic data should be from the lowest administrative level available. In GIS terminology, the spatial resolution of the data should be as high as possible.

Some official socio-economic data are not sample based and are collected at commune or village level, such as national Census, Agricultural Census, or the Commune Database in Cambodia. However, many other socio-economic data are sample based and are statistically representative for higher administrative levels and larger areas such as province or sub-national regional levels. For the purpose of MRC's development scenarios and State of the Basin reporting, socio-economic data that are representative for the district level would be desirable and adequate.

For assessments of transboundary issues it is desirable to have basin-wide views of socio-economic conditions at the local level so that comparisons of similar parameters between countries can be made. This requires that the data are consistent across countries (and the MRC programmes) with respect to terminology and concepts.

Official data obtained through sample surveys, such as Living Standard Measurement Surveys, or agricultural surveys will typically describe the scope for extrapolation of the data with the error margins resulting from this statistical operation¹. In terms of the temporal extent of the parameters in relation to hydropower planning, many general economic and social data are relevant in all time perspectives as they are indicators of overall societal development and are both conditions for and goals of development efforts, including hydropower development.

It is recognised that official statistical data does not include all the MRC relevant socio-economic parameters at locations close to the mainstream. SIMVA is the main survey tool to address this need. The SIMVA survey 2011 was designed to be representative of a corridor of 15 km on both sides of the Mekong mainstream and 40 km around flooded areas. ISH11 arranged a workshop on SIMVA and provided comments with a view to improve the approach and methodology for the next SIMVA to be done in 2014. Thus SIMVA will narrow its geographical scope and apply a 15 km buffer also around the flooded areas. Further, the sampling frame will be increased as to allow the survey to be representative of each of the 8 to 13 sub-zones (under discussion) within the corridor. This will improve the usefulness of SIMVA in terms of linkages to hydropower development impacts as measured at the zone or sub-zone level.

From a hydropower-information perspective, the present approaches to data gathering do not specifically cover the locations identified as needed by the ISH11 study. Therefore a complementary qualitative study of trends over the past 10 years at community level is proposed to be carried out at the ISH11 proposed monitoring locations. Whilst this is a proposal to augment the interpretative value of SIMVA, the focus on the locations most meaningful for hydropower-relevant information is an opportunity to achieve further hydropower-relevant objectives.

National level data on macroeconomic and energy statistics will be provided for each Member Country. For data to be comparable, national data would need to be harmonized, so this data will be compared with data available from international financial institutions to which the members belong, i.e. the Asian Development Bank (ADB), the World Bank and the International Monetary Fund (IMF), and which have existing harmonization procedures in place.

¹ This is also the case for the primary data collected by SIMVA 2011, however with the added problem of ensuring that the sampling frame and sampling methodology is statistically valid, which is an issue identified in Phase 1 and addressed in the design of SIMVA 2014.

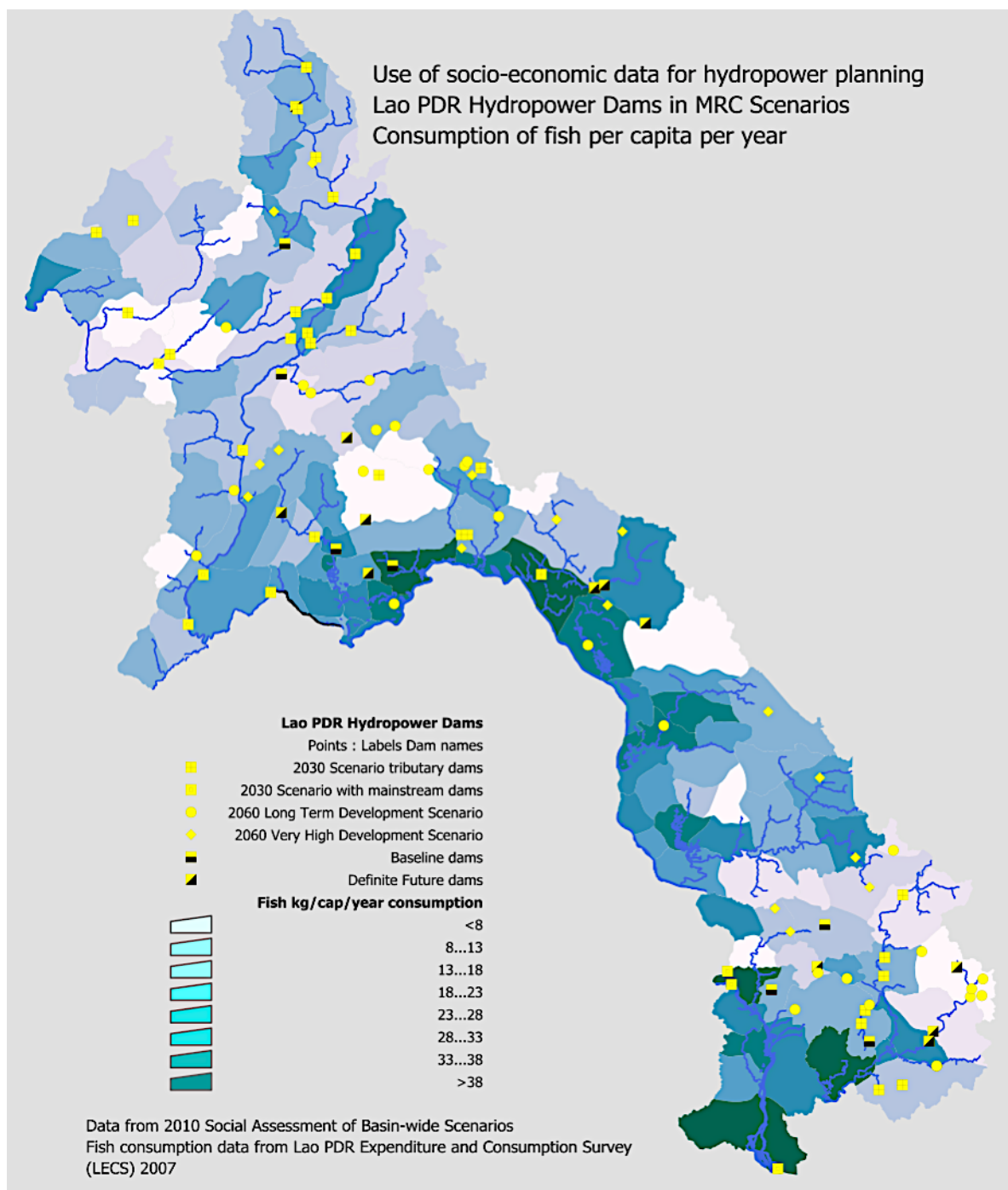


Figure 5 – Example of Spatial Use of Socio-economic Data – Hydropower Locations and District Level Data

4.4 Gap Analysis - Parameters

The parameters in the socio-economic database come from an original ‘long-list’ of socio-economic data that was used for earlier State of the Basin reports and for the assessment of basin-wide development scenarios in 2010-11. This long-list is comprehensive and furthermore is dynamic and open for inclusion of additional relevant parameters. While the social parameters included in the original long-list include all the hydropower-relevant social parameters, additional economic parameters specifically relevant for hydropower are an identified gap.

4.4.1 Parameters identified in Phase I

The socio-economic parameters that were identified as particularly relevant for hydropower planning in the ISH11 Phase I Report are listed in Table 8 and 9. The parameters were divided into social and economic for the sake of overview, however the distinction should not be considered strict (the various statistical surveys carried out by the national statistical agencies do not follow a strict terminology in this respect either). The table groups the parameters in thematic groups that will be used in the socio-economic database. The second column provides examples of the parameters' relevance to hydropower planning and monitoring.

Additional parameters for climate change, natural resource economics and governance were mooted at that time. As governance extends beyond the current remit of the socio-economics effort under ISH11 only the potential climate change and nature resource economics parameters are provided in the below table. It can be argued that these parameters belong to the economic group since they are increasingly included in cost-benefit analysis of hydropower development.

Table 9 – Social Parameters and Hydropower Relevance

Parameter group/Theme	Examples of relevance to Hydropower planning and monitoring	Parameter Type	Examples of parameters / data
Population & Demographics	<ul style="list-style-type: none"> ➤ Communities grow and shrink over time in response to hydropower development needs as well as opportunities arising ➤ Hydropower can result in migrations inwards and outwards at various stages during project development ➤ Consideration of vulnerable social groups requires special attention in implementing safeguards 	Population, structure	Urban, rural, household size, growth rates, locations
		Migration	Inter- and intra- national migration within region; temporary foreign migrants; permanent foreign migrants
		Vulnerable Social Groups	Ethnic minorities, indigenous peoples, disabled, elderly
Livelihoods	<ul style="list-style-type: none"> ➤ Hydropower can offer new employment opportunities ➤ Training and capacity-building schemes can be part of benefits offered by hydropower projects ➤ Traditional livelihood practices and resources can be impacted by hydropower, and are often the subject of mitigation measures 	Occupation	Sector-wise primary and secondary occupations
		Training	Forms of training, sectors, availability, attendance
		Access to Resources	Fisheries, river bank gardens, agricultural land, water resources, non-timber resources, community forest
Living Standards ▪ <i>Individual and household perspective</i>	<ul style="list-style-type: none"> ➤ Education level is a measure of households' capacity to adapt to changes and hydropower may increase access to education ➤ Hydropower may contribute to increase or decrease in income amount and stability ➤ Housing standards and assets are a measure of wealth/poverty; they are often considered in resettlement /compensation schemes for hydropower impacts ➤ Hydropower may provide opportunities for immediate benefits in terms of access to reliable and affordable electricity 	Education	Household education level, distance to nearest educational facility
		Income	Household income, sources
		Employment	Full-time, part-time, casual, duration
		Housing	House construction materials; house size
		Assets	Land, vehicles, boats, livestock
Energy	Electricity availability, electricity source, affordability, reliability, other energy sources		
Living Standards <i>Community perspective</i>	<ul style="list-style-type: none"> ➤ Hydropower may provide benefits in terms of increased access to and quality of services 	Access to services	Access to markets, communication, health services, clean drinking water - location, scale, staffing, services, assets, accessibility
Health	<ul style="list-style-type: none"> ➤ Hydropower may affect water related and communicable diseases dur- 	Disease	Malaria, liver fluke, HIV/AIDs, STDs

Parameter group/Theme	Examples of relevance to Hydropower planning and monitoring	Parameter Type	Examples of parameters / data
	ing and after construction, either positively or negatively ➤ Hydropower may impact access to aquatic foods and provide opportunities for substitutes, thereby influencing food security positively or negatively	Nutrition	Malnutrition cases, food sources, food accessibility
Culture and religion	➤ Hydropower schemes may affect aspects of a community's culture positively or negatively, and in direct and indirect ways, such as by increased protection, enhancements or impacts to cultural or religious sites, change in water flows impacting river related festivals, or new cultural events.	Religion	Religious affiliation, religious structures (churches, shrines, temples)
		Cultural Sites	Sites of cultural significance, level of protection, resources, accessibility
		Cultural Traditions	Festivals, events, traditions

Table 10 – Economic Parameters and Hydropower Relevance

Parameter Group	Relevance to Hydropower	Parameter Type	Examples of parameters / data
Energy Security & Distribution	➤ Hydropower schemes can support energy security needs ➤ Transmission systems are necessary to realise the benefits of hydropower schemes ➤ Electricity trade can be an opportunity arising from hydropower developments	Electricity Demand	Amount, timing, sources
		Electricity Supply	Amount, timing, reliability, efficiency, load-shedding
		Electricity Transmission	Sub-stations, transmission lines, losses
		Electricity Trade	Amount, timing, sources, destinations
Income & Revenue	➤ Hydropower projects generate revenue through electricity sales ➤ Additional revenues can be gained through taxes ➤ Trust funds and other financial benefit-sharing schemes can sometimes accompany hydropower projects ➤ Hydropower projects can stimulate regional economies which in turn can increase GDP for a region	Electricity Sales	Tariffs, revenues, timing, sources
		Taxes	Type, amount
		Trust Funds & Disbursement Schemes	Type, amount, destinations, purpose
		GDP	Amount, timing, sectors
Industries	➤ Hydropower projects stimulate regional economies through their demand for goods and services ➤ Hydropower projects support industries through their provision of electricity ➤ New industries can emerge leveraging off of opportunities created by a hydropower project	Goods & Service Industries	Sectors, scale, location, longevity
		Power Off-Takers	Electricity wholesalers, major industries; scale, location, longevity
		Spin-Off Industries	Sectors, scale, location, longevity
Employment	➤ Hydropower projects create direct employment to varying degrees during their life cycle stages ➤ Indirect employment can be created in a range of sectors through goods and service industries, power off-takers, and spin-off industries ➤ Labour can be sourced locally or from abroad, and can be housed on a construction site or in the communities ➤ Cost of labour can be an important economic factor ➤ Training needs can vary depending on	Job Creation	Direct, indirect; numbers, types
		Labour Force	Source, skills, residency, wages, entitlements
		Training	Capacity-building initiatives, training institutions, accessibility, attendance

Parameter Group	Relevance to Hydropower	Parameter Type	Examples of parameters / data
	recruitment strategies, available skills, and capacity-building initiatives		
Infrastructure	<ul style="list-style-type: none"> ➤ Hydropower projects represent substantial infrastructure investments in a region ➤ Associated infrastructure can include weirs, bridges, tunnels, outlying buildings etc. ➤ A hydropower project can affect local infrastructure positively or negatively, and in direct and indirect ways 	Project Infrastructure	Dam, power station, tunnels, weirs, roads, sub-stations, buildings
		Associated Infrastructure	Ship-locks, ship-lifts, ports, bridges, fuelling stations, storage facilities
		Local Infrastructure	Buildings, roads, boat ramps
		Instream structures	Dams, levee banks, groynes
Transport	<ul style="list-style-type: none"> ➤ Hydropower projects can affect local and regional transport positively or negatively, and in direct and indirect ways 	Automotive	Cars, busses, trucks; domestic, commercial
		Navigation	Boats: scale, purpose, usage, range
Markets	<ul style="list-style-type: none"> ➤ Hydropower projects can affect local and regional markets positively or negatively, and in direct and indirect ways 	Regional Markets	Type, goods and services, utilisation, accessibility, longevity
		Local Markets	Type, goods and services, utilisation, accessibility, longevity
Costs	<ul style="list-style-type: none"> ➤ Costs of a project must be weighed up against the benefits to support decision-making about hydropower projects 	Direct Project Costs	Goods, services, materials, labour, taxes
		Subsidies	Type, amount

Note: the individual and household perspectives on some of these parameter groups are described under the Social Parameters.

Table 11 – Potential Climate Change and Natural Capital Parameters

Parameter type	Specific Parameters
Climate change, assessing and monitoring benefits	Displacement of non-renewable energy by hydropower in Power Development Plans
	National CO ₂ emission intensity (kg CO ₂ per US\$ of GDP)
Natural Capital	Degree of hydrological regulation caused by dams
	Area of land taken by hydropower (reservoir + transmission)
	Area of agricultural land taken by hydropower (reservoir + transmission)
	Area of forest cover taken by hydropower (reservoir + transmission)

The addition of the economist to the ISH11 team lead to a restructuring of the above lists of social and economic parameters/indicators into a proposed integrated list of socio-economic indicators, shown in Table 12.

The ISH11 improvement proposals are designed to further define and elaborate on these hydro-power relevant indicators, where this is not already being undertaken under the BDP socio-economic database work.

Table 12 – Combined and Restructured List of Social and Economic Parameters

Indicator Group	Hydropower Relevance	Potential Indicators	Possible Parameters (if needed to form indicator)	
Population and Demographics	Used for per capita calculations, and to isolate changes for gender, minorities, or other vulnerable groups		Population	
			Dependency ratio	
			Household size	
	Hydropower may lead to resettlement	Nos of HHs resettled	Nos and % of ethnic minorities	
Income / Employment / Poverty	Hydropower as a development activity suggests that these indicators should improve at local and/or national scale		Gross domestic product	
			Power purchasing parity exchange rate (PPP)	
			Unemployment (%)	
			Ratio of gender employment	
Macroeconomics	Hydropower may assist economic growth		Gross domestic product	
			Export and import of power	
	Possibly decrease inequality of income distribution	Gini coefficient of income distribution		
	Hydropower projects may increase foreign direct investment	Foreign direct investment		
	Hydropower projects may spur industrialisation	Industrial Sector as % of GDP	Sectoral Accounts	
	Hydropower project affect capital formation	Private and Government Investment	National Accounts	
	Large hydropower projects may affect Macroeconomic Stability		Inflation	CPI or PPI, traded vs nontradeables
			Balance of Trade	Exports, imports
			Current Accounts	BoT, factor income, cash accounts
			Capital Accounts	FDI, other portfolio/investment
Large hydropower projects may lead to Exchange Rate Appreciation	Real Exchange Rate			
Energy	Hydropower may improve access to, and security of, energy, for households	Electrification	Nos and % of HHs connected to grid	
		Electricity Use per capita	GWh/capita	
	Hydropower may enhance industrial development opportunities	Energy Intensity	GDP / Energy Use	
		Industrialization	Industry share of GDP	
	Hydropower may stabilize power prices	Power Price	retail price of power	
	Hydropower may improve electric power system reliability	Power Reliability		
	Countries Investing in Hydropower may see direct benefits in terms of foreign exchange earnings	Power Exports		
	Countries investing in hydropower should see an increase in sectoral employment and output	Sectoral Employment		
Hydropower development will avoid emissions costs	Sectoral Share/Amount of GDP			
Capture Fisheries	Development of hydropower facilities may increase reservoir fishery but decrease riverine fishery		Avoided Emission Costs	
			Avoided GHG Costs	
			Fishery Capital	
			Fishery Effort	
			Fish Catch	
			Sectoral Employment	Full-time, part-time Part-Time
Rural Development	Development of hydropower facilities may increase funding flows to rural development		Sectoral Share/Amount of GDP	
			Areal Extent	
			Production (physical Units)	
			Sectoral Employment	
Transport and Navigation	Development of hydropower may increase road and river transport opportunities		Sectoral Share/Amount of GDP	
			Distance to main road	
			Time to reach market	
Health	Hydropower as a development activity suggests that these social and economic indicators of development should improve at local and/or national scale: positive or negative change in these indicators may particularly be observed in communities near hydropower facilities		Nos of HHs using river transport	
			Life expectancy at birth	
			Disease Occurrence	Occurrence HIV/AIDS Occurrence of Liver Fluke Occurrence of Malaria
			Access to Health Care	HH average distance and travel time to facilities
			Access to Clean Water	Nos and % of HHs with clean drinking water
			Access to Sanitation	Nos and % of HHs with access to sanitation
			Food Security	Malnutrition rate
			Protein (by source)	
			Sectoral Employment	No. Employed
			Sectoral Share/Amount of GDP	\$ in PPP
Education	Hydropower as a development activity suggests that these social and economic indicators of development should improve at local and/or national scale: positive or negative change in these indicators may particularly be observed in communities near hydropower facilities		Access to Education	
			Education Achievement Level	Education Achievement Literacy Rate
			Sectoral Employment	No. Employed
			Sectoral Share/Amount of GDP	\$ in PPP
Culture and Religion	Hydropower projects may endanger cultural and religious sites and disrupt local cultures		Retention of established religious and cultural sites of importance	
			Retention of or funding for cultural traditions	

4.4.2 Hydropower relevant socio-economic indicators and parameters in MRC context

In 2013 broader MRC work under the BDP programme aimed at the establishment of a socio-economic database. The BDP 'Scoping Report for Establishment of a Socio-economic Database', (draft), December 3, 2013, presents the current socio-economic (social and economic) parameters that are planned to go into the database (they will be called indicators to align with the nomenclature of the DevInfo software that will be used for the database). All of parameters in the combined list in Table 9 above are included in the current indicators for the socio-economic database.

4.4.3 Need for data from line agencies

During the work on the socio-economic database it has become clear that some of the hydropower relevant indicators require data from the line agencies that are not routinely collected by the national statistical agencies. Data that would come from Ministry of Energy include resettlement figures, size of labour force engaged in hydropower construction, and economic and financial data on hydropower projects. Data that would possibly come from Ministry of Education would include the number of hydropower engineers in the country. Data from Ministry of Environment and Natural Resources would include vulnerability assessments and the socio-economic data underpinning such. Clarity on which data must be obtained from line agencies will emerge from detailed screening of available socio-economic statistics. Data identification often requires review of the survey or census questionnaires since not all collected data are presented in publications. Thus it will require human resources to identify such data, and then to establish collaboration between the national statistical agency and the line ministry with the specific purpose of obtaining these data.

Cultural parameters

Information on cultural and religious sites is not well documented at present within the MRC information system, and some attention would be well put to this area as it has relevance to hydropower information needs.

Macroeconomics

Work is needed to identify the most informative and feasible set of macroeconomic and energy indicators with respect to trend variables for this information. Relevant literature review is also needed, as the MRC has neither existing capacity nor prior systematic efforts in these areas.

4.5 Gap Analysis - Timing

The general economic and social data currently collected are relevant for the planning horizons for hydropower as they are indicators of overall societal development. The data represent both conditions for, and goals of, development efforts including hydropower development. Time series of socio-economic data will be required for making projections into the future and scenarios of different development options.

Timing of national census's and surveys follows national schedules

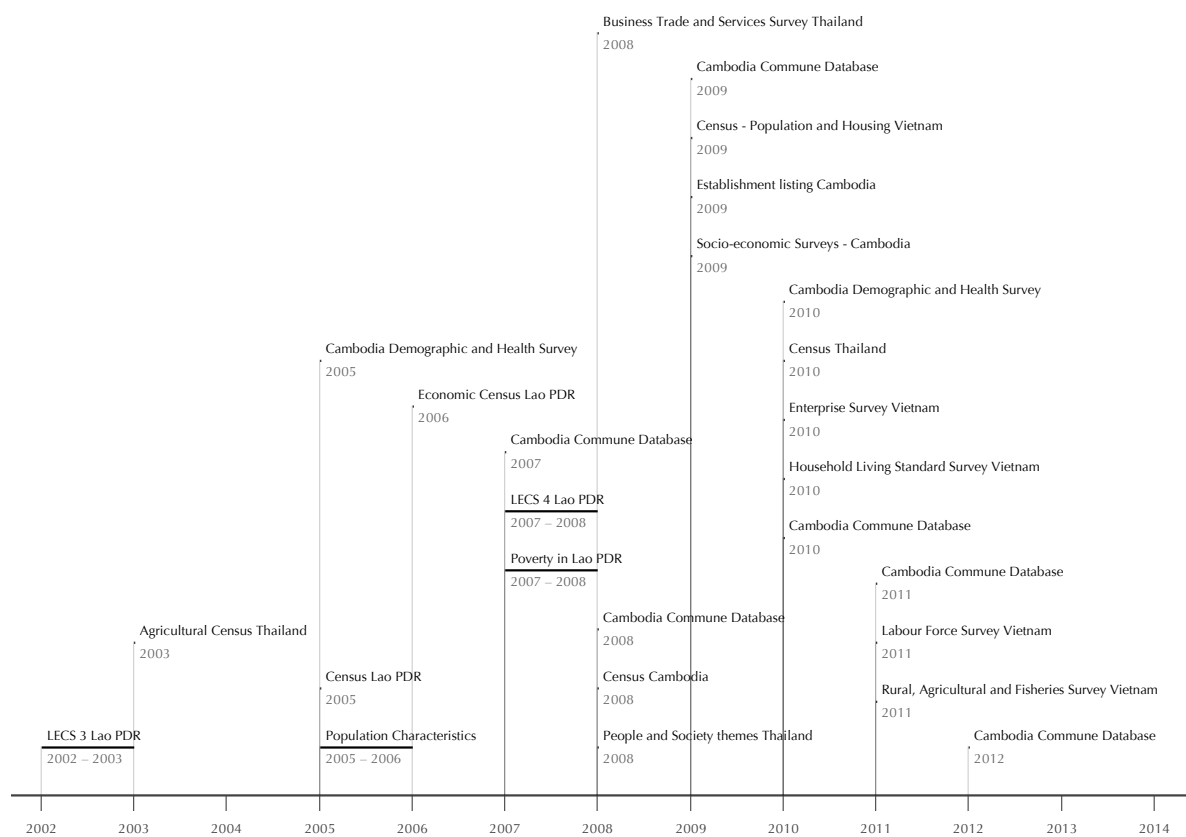


Figure 6) and it requires data harmonization based on agreed principles to establish a baseline. In the past lack of time series has been a serious limitation of social assessments of scenarios. In the establishment of the socio-economic database the starting point is to obtain the most recent data and then in the next stages to get time series of those variables. Macroeconomic and energy information would need to be collected on an annual basis, and systems need to be set up to enable this.

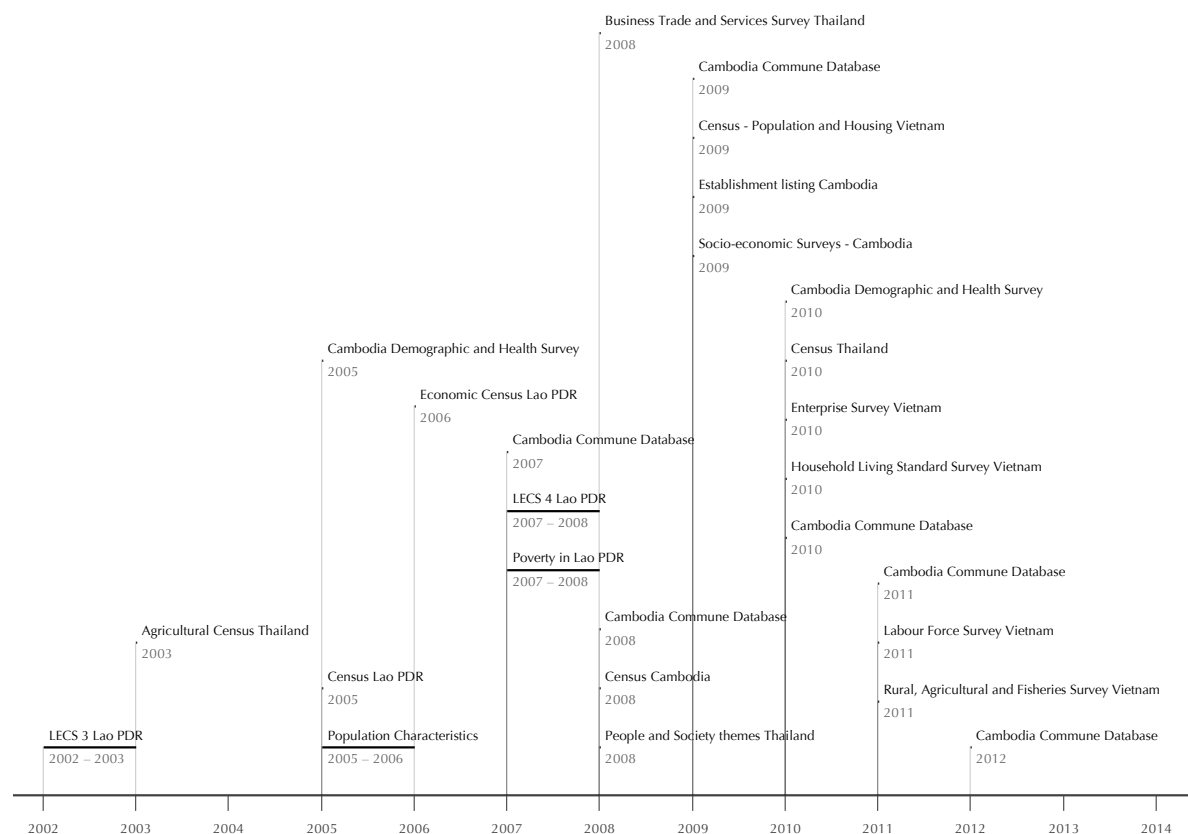


Figure 6 – Timeline of National Census's and Surveys

Data on perceived trends

The planned qualitative study under SIMVA focuses on trends over 10 years in communities along the mainstream, which offers considerable potential to get greater interpretation from presently held data and could provide a useful basis for later follow-up.

For SIMVA 2013-14 the data for establishing trends is planned to be the following:

The quantitative survey at village and household level: answers to questions about what has happened during the last 12 months can be compared to the answers to the same questions in SIMVA 2011 (which however will not establish a trend since there are only two data points), and then in the future compare with future SIMA surveys. A few questions are included that asks for a comparison of the most recent flooding event compared to earlier years, unspecified.

The qualitative study at village level: establish village timelines for water related events that have happened over the past 10 years. By combining the timelines form around 25-30 villages it should be possible to detect any trends.

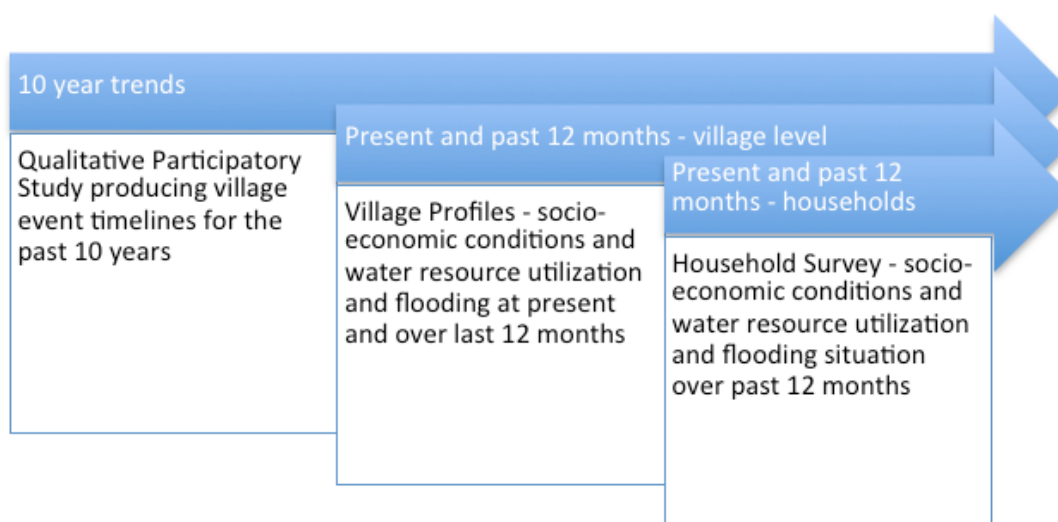


Figure 7 – Time Dimensions of the 3 SIMVA Data Collection Instruments

4.6 Gap Analysis - Information Management

Table 13 gives an overview of the different sources of socio-economic data. The table is reproduced from project reports from BDP's on-going Establishment of a Socio-economic Database for MRC. The table has been used in meetings with NMCs and national statistical agencies to provide a common understanding of the different data sources and the data management arrangements.

Table 13 – Overview of MRC's Socio-economic Data Sources

	Main data sources		Other sample surveys	Case Studies	Specific data for ISH11
	MRC Socio-economic database	SIMVA			
Basic type	Official national data	MRC primary data		Both	
Institutional anchoring - National level	NMCs and National Statistical Agencies	NMCs	NMCs and MRC Programmes and collaborating line agencies		
- Basin level	BDP - IKMP	Environment Programme	MRC programmes: Agriculture and Irrigation; Navigation; Fisheries; Flood Management and Mitigation; Climate Change and Adaptation		
Input data source	Official statistics: Census. Living Condition/Expenditure Surveys. Sector specific surveys, e.g., Agriculture, Fisheries, and Enterprises.	Mekong mainstream 30 km corridor + 15 km buffer of flooded areas. 8 socio-ecological zones.	Varying: HH and village, market and fishery surveys; other	Varying: qualitative studies; some based on secondary data	International financial institutions; Country line agencies, e.g., department of energy;
	Sample Surveys representative of various administrative levels or zones	Sample to be representative of the whole mainstream corridor and zones.			ISH11 Proposal: SIMVA qualitative study in monitoring locations

For the MRC socio-economic database the National Statistical Experts from the national statistical agencies on the project team ensure that data collection and provision to the MRC is through official processes. Approaches for data harmonisation and standard procedures are under development.

The socio-economic database will be the container of all socio-economic data, including the specific hydropower relevant parameters. A comprehensive system is being designed for information management. The database will be based on DevInfo software, which is used in all the countries (in Thailand to a limited degree), and which is designed for harmonisation of data from different sources, and countries, using the Statistical Data and Metadata Exchange (SDMX) standard. It is the intention to establish national level installation of the DevInfo database into which the national statistical agencies can feed data using predefined templates that fit the database structure. The templates include comprehensive metadata descriptions. It is currently being discussed which unit in MRCS will be the custodian and manager of the central database.

The cost of obtaining official socio-economic statistical data is relatively low, but it is critical that resources and funds are allocated for data acquisition, data entry and data management.

The current setup of SIMVA data collection is costly, and it could be lowered by collaboration with and future integration into national statistical systems, which could involve self-monitoring approaches.

4.7 Gap Analysis - Information Use

The socio-economic database will be available on the web. Data will be able to be searched through various thematic groups, by location, country, year etc. The web-based interface will include a GIS component as well as table and graph functions so data can be viewed in different ways. Data can be downloaded for further statistical analysis. Macroeconomic and energy information, once better targeted and collected, should be available for programme use and, in particular, available for use in periodic State of the Basin reports.

4.7.1 Capacity for Data Analysis

A high level of analytical capability is required to make the socio-economic data collected in the socio-economic monitoring system and contained in the MRC socio-economic database, and in SIMVA reports, relevant for planning and monitoring hydropower. The different spatial levels to be considered, the time dimension, and not least attribution of cause to effect issues are challenges when trying to predict socio-economic development as the context for hydropower planning decisions, and when assessing the impacts of hydropower as plants are constructed and become operational. Thus social scientists and economists must be involved in the analysis of data.

Further, the use of GIS will be indispensable for organizing and presenting the baseline data and the M&E system data since impacts of hydropower development to a large degree will be localized along river stretches and connected wetlands including Tonle Sap and the Mekong Delta.

As mentioned it is proposed to build MRC's capacity for socio-economic analysis by establishing a Socio-economic Expert Technical Working Group. This group would also oversee the information management aspects of socio-economic data in MRC.

5 Socio-Economics Improvement Proposals for Hydropower Information

Three socio-economics improvement proposals– in additions to the activities related in the previous sections – are planned for ISH11.

5.1 Approach and Rationale

Notable initiatives are in progress by the MRC Programmes in acknowledgement of the importance of having consistent, comprehensive and updated socio-economic data available in the MRCS. The approach taken by the ISH11 study with regard to improvements of socio-economic data has been to integrate hydropower-relevant data collection into existing, or emerging data collection tools and mechanisms, in the context of the planned restructuring of MRC and decentralisation of some core functions to the NMCs. The rationale has been to avoid parallel and duplicate systems of socio-economic data collection. ISH11 has already established a close working relationship with BDP on the establishment of the MRC socio-economic database and on the inclusion of hydropower-relevant parameters into the list of MRC parameters in that database. Also ISH11 has been working with EP on improvements to the SIMVA data collection. Consequently there are only three proposals for additional activities to improve on socio-economic information for hydropower-relevant needs.

Proposals SE1 ‘Macroeconomic and Energy Indicators for Hydropower Information’ and SE3 ‘Mekong River Cultural and Religious Sites’ address parameter gaps in the guiding framework for hydropower information that do not presently have any MRC attention directed to them.

Proposal SE2, ‘SIMVA Enhancements for Hydropower Information’, is a proposed qualitative study to complement the SIMVA quantitative survey. Because it is proposed to be conducted at the 33 hydropower-relevant locations identified by ISH11, it is included here as it would strengthen the socio-economic information at hydropower locations.

Further background and supporting information for these improvement proposals can be found in the Socio-Economics Annex to the Phase 2 Report.

5.2 SE1: Macro-Economic and Energy Indicators for Hydropower Information

Gap Addressed in Guiding Framework: The following Guiding Framework criterion would be addressed or enhanced by this proposal.

- *2. Parameters Monitored; 2a) Provide inputs to indicators related to hydropower planning and management.* Macroeconomics and energy indicators require development.

Objective and Description: The objective of this proposal is to provide the MRC with a set of macroeconomic parameters and indicators. Here national energy statistics are included alongside the more purely macroeconomic indicators. The effort is to trial the compilation of a historical dataset for the Member Countries in order to portray current conditions as well as long-term trends. Various efforts have been made as part of other MRC studies to assess macroeconomic issues and examine these trends in various ways. The effort proposed here is simply to attempt to develop an appropriate database of comparable figures for the Member Countries that can be readily and easily updated on a periodic basis.

Linkages:

- This proposal complements ISH Output 3.1a on Macroeconomics and Hydropower.

- This proposal supports Output 2.1 of the BDP work plan to develop an MRC socio-economic database, and the BDP project to develop an MRC indicator framework.
- Up-to-date information on macroeconomics and energy indicators can provide inputs into the BDP scenario assessments and State of the Basin reporting. This proposal can also potentially support the Council Study, capacity-building in association with decentralisation, and RSAT information needs.

Relevant MRC Procedures or Guidelines: None identified.

Proposed Activities and Outputs: Activities proposed for ISH11 Phase 3 include the following.

1. Review literature and consult with stakeholders to develop the parameter groups, parameters, and data.
2. Assess and consult regarding potential national and international data sources.
3. Develop a historical database of selected data.
4. Compute selected parameters and prepare tables/graphs for presentation of conditions and trends.
5. Develop instructions on the source and downloading of parameters. In the first instance, all the data are secondary and will be obtained from national or international datasets, and no processing of the data is envisioned. Combinations of parameters would be clearly specified where necessary to derive indicator time series data.
6. Prepare a Macroeconomic Indicators Annex Report for the ISH11 Phase 3 Report.

Resource Requirements and Implementation Commitments: Inputs to deliver this proposal include:

- Work under ISH11 Phase 3 for the IC Economist (estimated 30 days).
- Support from and collaboration with BDP team;
- Consideration should be given to the recruitment of a Riparian Economist either to ISH or BDP as this is currently a major gap in the MRC staffing skills.

Sustainability Considerations: At present the MRCS does not have an economist on staff thus there is no natural liaison for this effort within the institution. The potential for developing such capacity, perhaps as a Riparian Professional, would be explored as part of the proposal.

Outcomes and Benefits: This data will be available to users as part of the socio-economics database. It will be available to the State of the Basin Report and other studies that would normally need to develop such information for their own purpose and analysis.

5.3 SE2: SIMVA Enhancements for Hydropower Information

Gaps Addressed in Guiding Framework: The following Guiding Framework criteria would be addressed or enhanced by this proposal.

- *1. Locations of Data Collection; 1b) Near proposed or operational hydropower project or group of projects.* SIMVA locations for in-depth study are proposed to be aligned with priority hydropower locations.
- *3. Timing of Data Collection; 3b) Frequency captures natural or operational system changes and migratory cycle.* Proposed SIMVA qualitative study focuses on trends over ten years in main-stream communities.

Objective and Description: Objectives of this proposal are to obtain qualitative socio-economic information on community perceptions of the most important factors over time, with focus on water-related factors that influence the socio-economic situation and community well-being of villages near the Mekong River, and to obtain more information on the deeper causes that has led to changes in the socio-economic status.

Linkages:

- This proposal would support SIMVA, which is in EP's work plan.
- Outputs could potentially contribute to the Council Study and to RSAT information needs.

Relevant MRC Procedures or Guidelines: None identified.

Proposed Activities and Outputs:

1. A study guideline has been drafted and is currently circulated for comments. The study guideline provides more details of approach, selection of communities for research, field research activities in focus groups, and outputs in terms of data structure, and analysis. The study proposes to apply a participatory method to create a timeline of important events that have influenced the general community well-being and socio-economic status in the selected villages.
2. The relationship between events - cause-effect - would be discussed with villagers and the positive or negative impacts of each event would be assessed.
3. The analysis would map the events to a list of key words, which would allow for quantification of similar types of events across the villages.
4. The study is not meant to be statistically representative of villages along the Mekong in a strong sense (which will be done through the Village and Household survey),
5. The study will yield data that can provide a picture of common issues affecting communities, with focus on those related to river water resources.
6. The study would focus on villages located near the 33 hydropower-relevant monitoring locations identified by ISH11. This selection of locations would allow for correlating the water quality, fisheries, and sediments, biological and hydrological data with the results on long-term trends that the study will provide.

The study is planned to be carried out in conjunction with the SIMVA quantitative survey in the first half of 2014. The output would be a study report.

Piloting a self-monitoring system:

Community self-monitoring is a method that is being used for a variety of purposes in different contexts by development agencies and organizations such as for health monitoring, natural resource impact monitoring, water supply and hygiene monitoring, social and socio-economic development monitoring.

The qualitative study could be used as a starting point for piloting a self-monitoring system through which villages and/or district administrations fill out and send a relatively simple questionnaire to the NMCs every year with updates on key social (and economic) parameters relating to the river and their use of it. The data could be sent by mail or internet to the NMCs and forwarded to MRC. Spot checks would be used for data quality assessment.

The data could include, among others:

- Drinking water supply from the river
- Irrigation from the river
- Number and size of river bank gardens in the district

- Proportion of full-time, part-time and occasional fishers
- Proportion of people engaged in aquaculture
- Income from fishing licenses if applicable
- Number of types of fishing gears
- Number of river transport boats with their base in the district
- Number of landings for commercial transport of products (in bulk) and also people
- Tax and other income from river transport
- Logging and river transport of logs
- Pollution streams into the river

Resource Requirements and Implementation Commitments: The study outline as currently planned would require the following, noting that the tentative budget needs to be reviewed.

- IC Social Specialist/Socio-economist 20 days (over and above existing SIMVA commitments)
- Payment of field research, incl. research team, logistics, training, community focus group discussions, data entry and quality check
- Total commitment from the MRC of \$50,000 estimated.

Sustainability Considerations: In a long-term perspective, it is the intention that the study would form the basis for establishing a long-term collaboration with the research villages, so they eventually would be able to monitor relevant socio-economic changes themselves, i.e. self-monitoring. This links to the development of improved long-term monitoring supported by ISH11. The institutional anchoring needs to be explored. At the lowest level, it could be anchored in individual communities, sub-basin organisations, district statistical offices, or NGOs. At the national level it could be anchored in the NMCs, supported by the national statistical agency, being responsible for collecting and quality assuring the data. In the MRCS, the anchor would be EP, and later, after MRC restructuring, a possible Socio-Economics Expert Group. The costs would be low, requiring incentives to participating communities and regular visits to same, as well as data entry, but this could be done automatically via electronic forms or web-based survey tools.

Outcomes and Benefits: The study supports a number of aspects of the ISH11's proposed guiding framework for hydropower-relevant information. The immediate benefit of the study would be to obtain more reliable data on perceived trends, and causes of events that have had an positive or negative impact on communities near the Mekong mainstream and Tonle Sap over the past 10 years. This would provide a baseline with which to compare later regularly submitted community data from self-monitoring. By asking for perceived causes it will be possible to distinguish hydro-power impacts from other development or socio-economic activities. The community self-monitoring would be a potentially sustainable low cost source of detailed local level information on river related activities and changes, and would further enhance stakeholder involvement in MRC's activities.

By supporting this qualitative study, ISH11 could achieve progress on several aspects of the Guiding Framework for hydropower information, namely:

- adding socio-economic research at the hydropower-relevant monitoring locations, with the potential to merge this information with that collected by other disciplines, hence augmenting not only SIMVA but environmental data collection with interpretive insights for already collected information;

- potentially contributing to transboundary understanding in that communities may attribute events and changes to causes occurring in another country; and
- exploring communities' own explanations of cause-effect relationships in major events that have affected their community over the past 10 years, which will contribute to the ability to distinguish cause-and-effect of changes due to hydropower versus other developments.

5.4 SE3: Mekong River Cultural and Religious Sites

Gap Addressed in Guiding Framework: The following Guiding Framework criterion would be addressed or enhanced by this proposal.

- *2. Parameters Monitored; 2a) Provide inputs to indicators related to hydropower planning and management.* Information on cultural and religious sites requires development.

Objective and Description: The objective of the inventory would be to provide information and locations on cultural and religious sites related to the Mekong River.

The Mekong and surrounding areas has a very rich culture and religious beliefs related to the river and water bodies, as also recognized by UNESCO (2004), which states "The Mekong River, the 'Mother of Waters' is a complex ecosystem and an important part of life and spirituality in South-east Asia", and further "The rivers play an essential role in the life of the local communities. For centuries, the Tai and Lao people have relied on and integrated their cultures into the lowland water systems of Southeast Asia. In recognition of its importance, water and its surrounding elements are integrated into the ritual and festival calendars of the Tai and Lao cultures. Pimai, or Lao New Year, is an important annual ceremony combining water, water spirits, religion and social events with the reaffirmation of traditional kinship".

An interesting study of the 'naga' in Lao PDR includes maps of sacred places related to the rivers and the 'naga's that reside in or close to them (Ngaosrivathana and Ngaosrivathana 2009). Attachment 3 presents a map and an excerpt from the book that illustrates the richness of religious and cultural beliefs associated with the Mekong and tributary rivers

Cultural and religious beliefs are often linked to local resource management systems and are also of value in their own right. That this is being taken seriously by cultural conservationists is exemplified in the fact that in Luang Prabang in Lao PDR, the area under the protection of the World Heritage Convention includes the banks of the Mekong and Khan rivers on the other side of the peninsula.

Culture is an important parameter group under the social dimension, and it would be valuable for the ISH11 project to show that it is contributing directly to obtaining information in this currently under researched area. In Phase I it was proposed to include in the Joint Mekong River Survey a mapping of river spirits and sacred areas in or around the river at the ISH11 priority monitoring locations. Since the One River Survey idea has been abandoned, such mapping could be included in the piloting of a village and/or district self-monitoring system.

It would therefore be valuable for the ISH11 study to contribute to obtaining information in this currently under researched area.

Linkages:

- Currently there is no programme that deals with cultural and religious sites. This activity would be GIS-based so there is a potential link to IKMP in terms of data presentation.
- This proposal could support BDP processes including the State of the Basin report, and RSAT information needs.

Relevant MRC Procedures or Guidelines: None identified.

Proposed Activities and Outputs: The inventory is proposed to be based on secondary sources, and mapping to be done as a desk study. Activities would include:

1. identification of data sources: books, maps, studies, web sites such as ADB GMS-EOC;
2. mapping of cultural and religious sites and entering the relevant descriptions of their nature, background, history, present status, etc; and
3. developing a GIS layer with cultural and religious sites published on the MRC web site and planning atlas.

Resource Requirements and Implementation Commitments: The initial estimate of the resource requirement includes:

- Scoping and specification (IC Social specialist, 3 days)
- Research and mapping (IC Social specialist 5 days; Field researcher 10 days; GIS specialist 7 days)
- Total commitment required – 25 person-days, or \$12,500

Sustainability Considerations: Once the GIS layer is produced it can be updated as new information becomes available. This could be decentralised to the NMCs.

Outcomes and Benefits: Cultural sites could be taken into consideration in the planning of hydro-power projects.

6 Conclusion

Many of the hydropower-relevant information needs are currently being addressed through the establishment of a socio-economic database for MRC, led by BDP, which will centralise socio-economic information collected by the Member Countries and promote sharing and accessibility.

The MRC EP coordinates a field-based socio-economic data collection programme, SIMVA, which is responsive to the specific information needs for hydropower and other sectors, and has been continuously improving the methodology for the survey.

Some parameter gaps identified by the ISH11 study relate to macroeconomic and energy statistics indicators, and cultural values. ISH11 has also identified an opportunity to increase SIMVA's relevance for hydropower by targeting communities at the 33 ISH11 priority monitoring locations for the qualitative study of the 2014 SIMVA.

7 References

- Aylward, B., J. Berkhoff, C. Green, P. Gutman, A. Lagman, M. Manion, A. Markandya, B. McKenny, K. Naudascher-Jankowski, B. Oud, A. Penman, S. Porter, C. Rajapakse, D. Southgate, and R. Unsworth (2001) *Financial, Economic and Distributional Analysis*. World Commission on Dams Thematic Paper 3.1, Cape Town.
- Colantonio, A. (2007) *Social Sustainability: An Exploratory Analysis of its Definition, Assessment Methods, Metrics and Tools*. European Investment Bank, Oxford Institute for Sustainable Development (OISD).
- Hall, B. & L. Leebouapao (2005) Economic Valuation of Alternative Lower Mekong River Flow Regimes (Incomplete Draft). Submitted to the Mekong River Commission as part of the Integrated Basin Flow Management (IBFM) Phase II.
- ICEM (2010) Economics Baseline Assessment Working Paper. MRC SEA for Hydropower on the Mekong Mainstream. International Centre for Environmental Management, Hanoi
- IHA (2010) *Hydropower Sustainability Assessment Protocol*. International Hydropower Association, Sutton, London, UK.
- Kusek, Jody Zall (2004) *Ten steps to a results-based monitoring and evaluation system : a handbook for development practitioners* Jody Zall Kusek and Ray C. Rist. The World Bank
- Lange, G.-M., and R. Hassan (2006) *The Economics of Water Management in Southern Africa: An Environmental Accounting Approach*. Edward Elgar, Cheltenham.
- Laplante, B. 2005. Economic analysis of the environmental and social impacts of the Nam Theun 2 Hydroelectricity Power Project: Final Draft Report. Submitted to The World Bank.
- Mayoury Ngaosrivathana and Pheuiphanh Ngaosrivathana (2009) *The Enduring Sacred Landscape of the Naga*. Chaing Mai, Mekong Press.
- MRC (2010) State of the Basin Report 2010. Mekong River Commission, Vientiane, Lao PDR. 232 pp.
- MRC (2011a) BDP Programme Phase 2 Assessment of Basin-wide Development Scenarios. Mekong River Commission, Vientiane, Lao PDR. Main Report 229 pp.
- MRC (2011b) BDP Programme Planning Atlas of the Lower Mekong River Basin. Mekong River Commission, Vientiane, Lao PDR. 101 pp. River Commission, Vientiane, Lao PDR.
- Millennium Ecosystem Assessment (2005) *Ecosystems and Human Well-being: Synthesis*. Island Press, Washington DC.
- OECD (2002) "Glossary of Key Terms in Evaluation and Results Based Management. Evaluation and Aid Effectiveness." No 6 <http://www.oecd.org/dataoecd/29/21/2754804.pdf>
- OECD (2007) *Promoting Pro-Poor Growth: Practical Guide to Ex Ante Poverty Impact Assessment, DAC Guidelines And Reference Series*, OECD, Paris.
- Pearce, D., E.B. Barbier, and A. Markandya (1990) *Sustainable Development: Economics and Environment in the Third World*. Earthscan, London.
- Resilience Alliance (2007) *Assessing and managing resilience in social-ecological systems: A practitioner's workbook*. Version 1.0 June 2007.
- UNESCO (2004) *IMPACT: The Effects of Tourism on Culture and the Environment in Asia and the Pacific: Tourism and Heritage Site Management in Luang Prabang*, Lao PDR. Bangkok, United Nations Educational, Scientific and Cultural Organization.
- UNSD (1993) *Handbook of National Accounting - Integrated Environmental and Economic Accounting*. Vol. No. 61. United Nations Statistics Division, New York.

World Bank Tools for Institutional, Political and Social Analysis of Policy Reform: A Sourcebook for Development Practitioners or TIPS, World Bank

WCD (2000) *Dams and Development: A New Framework for Decision-Making*. Report of the World Commission on Dams, Earthscan, London.

WCED (1987) World Commission on Environment and Development: Our Common Future. Oxford University Press, Oxford.

Attachment 1 – Annotated Bibliography

Year	Reference	Comment
2010	MRC: The ‘Social Assessment, Assessment of Basin-wide Development Scenarios’	The social assessment calculates social impacts of the different development scenarios with a focus on the impacts from dam construction; flow regime change and depletion of capture fisheries. The key indicators are grouped in four dimensions <u>Dependency</u> , <u>Exposure</u> , <u>Sensitivity</u> , and <u>Resilience</u> . The study covered both the areas along the mainstream and areas along tributaries where hydropower dams are planned. The assessment was based on District level official statistical data for the whole LMB, except for Thailand for which the data were not available in time. For Thailand the assessment was based on the approach of the SIMVA (see below). The report includes a list of reference literature, which is included in the present list as it has been considered in the drafting of the approach to the social and economic baseline monitoring under ISH11.
2009	MRC: The ‘Stakeholder Participation and Communication Plan for Basin Development Planning in the Lower Mekong Basin’	The report outlines approaches, strategies and mechanisms for MRC engagement with the wider set of stakeholders. It describes processes of sub-area analysis with the objectives of bringing local perspectives into basin planning and basin perspectives into national planning. Sub-area analysis is part of the IWRM strategy. During the first phase, sub-area profiles will be prepared, including a classification of sub-tributary catchments into development catchments, conservation catchments, and critical catchments (with significant development-protection trade-offs). During phase 2, a Sub-area IWRM Strategy will be prepared in a participatory manner, which facilitates the development and management of the land, water and related resources in each of these catchments. The baseline monitoring for sustainable hydropower will have to align with these sub-areas.

2003	Hook <i>et al</i>: The 'Social Atlas of the Lower Mekong Basin'	This was the MRC's first and most comprehensive work on presenting social conditions and issues across the LMB. When published in 2003 it was the only document of its kind to focus on social indicators at the province level in Cambodia, Lao PDR, Thailand, and Viet Nam. The 45 social maps include country overviews, and cover population, labour force, living standards, health and education. Given that data were collected in Cambodia, Lao PDR, Thailand, and Viet Nam at different times using differing definitions and methodologies, it was often impossible to generate a dataset for an indicator that is perfectly comparable across the four countries. One major problem comes from having to compare data values that come from different years. These problems are still there and will have to be addressed in all future efforts to compile basin-level sociological data. The data in the Social Atlas are from 1995-2000 and are mostly of historical interest today.
2011	MRC: 'BDP Planning Atlas'	A broad range of socio-economic data is summarised in the atlas. Which includes a chapter on Social Attributes. The data include a number of basic socio-economic parameters obtained by BDP from line agencies in the four countries and processed under SIMVA in 2010. Because the data were in different formats, and parameters were for different levels i.e., by province or by country SIMVA focussed on only 12 parameters as follows: <ol style="list-style-type: none"> 1. Poverty rate 2. Infant mortality rate 3. % Child malnutrition 4. Unemployment rate 5. Proportion of population finished lower secondary school 6. Proportion of employment in agriculture sector 7. Proportion of population with access to electricity 8. Proportion of population with access to sanitation 9. Proportion of population with access to safe water 10. Total fertility rate 11. Household size 12. Dependency ratio
2012	ADB: Greater Mekong Sub-region Atlas of the Environment'	This is a comprehensive atlas and source of information for the wider GMS, including LMB. Chapter 7 has tables with all the data that are presented in the maps. Data are from a very comprehensive list of sources. For the socio-economic aspects the most relevant are the sections on: country; peoples and cultures; poverty and environment; agriculture, fisheries and food security; energy; urbanisation; transport; tourism; and human resource development.
2008	NCCR & IDPRI: 'The Geography of Poverty and Inequality in the Lao PDR'	It contains poverty mapping based on the third Lao Expenditure and Consumption Survey (LECS III) (NSC, 2004) carried out in 2002-03, and the 2005 Population and Housing Census (Government of the Lao PDR, 2006). The maps provide a national-

		level baseline for the 'pre-hydropower' situation, as there were very few plants in operation at the time. Further, the book presents a number of regression models of poverty based on per capita expenditure.
--	--	---

Other selected documents reviewed (sorted descending by year):

Year	Reference	Comment
2013	David J.H. Blake (M-POWER): Irrigation drivers, dilemmas and logics in Northeast Thailand in the early 21st century. David J.H. Blake: M-POWER Research Fellow, affiliated to the Mekong Sub-Regional Social Research Centre (MSSRC), Faculty of Liberal Arts, Ubon Ratchatani University. In SIWI/IWMI Shared Waters Partnership. Workshop on Food Security in the Mekong – The Water, Food, Energy Nexus Revisited Chiang Rai, 11-13 March, 2013	Background on irrigation development trends in Issan.
2013	Diana Suhardiman and Mark Giordano (SIWI/IWMI): Legal plurality: An analysis of power interplay in Mekong hydropower. In Food Security in the Mekong The Water, Food, Energy Nexus Revisited Chiang Rai, Thailand 11-13 March 2013	Presentation on legal and institutional aspects of sustainable hydropower development
2013	J. Armstrong: Food security in the Lower Mekong. Conceptual approaches and the regional context. Presented by J.Armstrong. PhD Candidate, City University, London, Centre for Food Policy Studies.	Background on food and nutrition security in LMB.
2013	David Dumaresq: Food Balance, Trade and Vulnerability in the Lower Mekong Basin: Moving to a Food Sovereignty Model of Food Systems Adaptation. David Dumaresq, Fenner School of Environment and Society. Australian National University. In Food Security in the Mekong . Shared Waters Workshop. Chiang Rai ,11-13 March 2013	Background on food security and trade in LMB.
2013	Dr Jamie Pittock: Hydropower and food along the Mekong River. Dr Jamie Pittock Fenner School of Environment & Society. In Food security in the Mekong – The water, food and energy nexus revisited, Chiang Rai, 12th March 2013	Background on food security and hydropower in LMB.
2012	Ms. Sureerat Santipaporn (Director of Social Statistics Bureau National Statistical Office, Thailand): Country presentation: Food Insecurity Assessment In Thailand. 24th Session of APCAS 8-12 October 2012 Da Lat, Viet Nam.	Description of methodology for food security analysis and results of analysis for Thailand

2012	Ministry of Energy, Thailand: Summary Of Thailand Power Development Plan 2012 – 2030 (Pdp2010: Revision 3). Energy Policy and Planning Office, Ministry of Energy.	Background on power sector in Thailand.
2012	Nguyen Anh Tuan: A Case Study on Power Sector Restructuring in Vietnam. Pacific Energy Summit, 2012	The study argues that as a result of unbundling, competition in the electricity sector is increasing and the quality of power networks has improved.
2012	World Bank: Lao PDR Power to the People: Twenty Years of National Electrification. Asia Sustainable and Alternative Energy Program IBRD, World Bank.	Report on the ‘success story’ of electrification in Lao PDR.
2011	Electricite Du Laos (EDL): Electricity Statistics, Lao PDR. Statistics-Planning Office, EDL.	The Statistical Yearbook is a reference serving as background for researching, planning or general knowledge to readers on the various sectors.
2011	Nguyen Minh Duc (Nong Lam University, Vietnam): Value Chain Analysis, Fisheries Sector, Vietnam.	Study of value chain of fisheries in Vietnam. Background info for monitoring of impacts on fisheries in Mekong Delta.
2011	Diana Suhardiman, Sanjiv de Silva (IWMI), and Jeremy Carew-Reid (ICEM): Policy Review and Institutional Analysis of the Hydropower Sector In Lao Pdr, Cambodia, and Vietnam. Final Report May 2011.	Background on institutional and policy aspects of hydropower in LMB.
2011	Claudio O. Delang and Matthew Toro: Hydropower-induced displacement and resettlement in the Lao PDR. South East Asia Research, 19, 3, pp 567–594 doi: 10.5367/sear.2011.0056	Case study that describes the attitudes of the farmers displaced due to the construction of dams
2010	Johnston, R. M.; Hoanh, C. T.; Lacombe, G.; Noble, A. N.; Smakhtin, V.; Suhardiman, D.; Kam, S. P.; Choo, P. S. (IWMI): Rethinking agriculture in the Greater Mekong Sub-region: how to sustainably meet food needs, enhance ecosystem services and cope with climate change. Colombo, Sri Lanka: IWMI. 26p. doi:10.3910/2010.207	Background on agriculture in LMB.
2010	MRC: Agricultural Impact Assessment. Technical Note 8. Basin Development Plan Programme, Phase 2	BDP assessment of impacts of hydropower development on agriculture.
2010	MRC: Social Impact Monitoring and Vulnerability Assess-	BDP assessment of social

	ment (SIMVA). Environment Programme	impacts and vulnerability in villages in the 15 km corridor along the mainstream Mekong and Tonle Sap.
2010	Somsak Boromthanasart (TNMC and MRC): National Report of the Social Impact Monitoring and Vulnerability Assessment Phase II.	SIMVA report from Thailand.
2010	Pornchai Wisuttisak: Regulatory Framework of Thai Electricity Sector. Pornchai Wisuttisak. PhD candidate. School of Business Law and Taxation. Australian School of Business. The University of New South Wales, Sydney, Australia	The research paper aims to critically examine the issue in the regulatory framework and competition policy in Thai electricity sector
2009	Baird, Ian G. (Rivers Coalition in Cambodia, Phnom Penh): Best Practices in Compensation and Resettlement for Large Dams: The Case of the Planned Lower Sesan 2 Hydropower Project in Northeastern Cambodia.	Background information on resettlement issues in LMB.
2009	The Expansion of Mining Activities and Indigenous Peoples' Rights in Mondulkiri Province. Case studies in Gati village, Keo Seima district, and Pou Rapeth viilage, Pechreada district. CCC, November 2009: .Analyzing Development Issue Project.	Case study with background info on ethnic groups and land rights in Cambodia.
2009	MAFF, Cambodia: Overview of Economic Land Concessions in Cambodia. Website accessed through: http://www.elc.maff.gov.kh/overview.html	Info on land issues in Cambodia.
2009	NESDB, Thailand: National Income of Thailand, 2008 Edition. National Economic and Social Development Board. Kingdom of Thailand.	Background info on economic situation in Thailand.
2009	UNEP (Asian Institute of Technology): Freshwater Under Threat, South East Asia: Vulnerability Assessment of Freshwater Resources to Environmental Change.	Background on threats to freshwater in SE Asia.
2009	Isvilanonda S. and I. Bunyasiri: Food Security in Thailand Status, Rural Poor Vulnerability, and Some Policy Options. ARE Working Paper No. 2552/1. (September 2009)	Background on food security in Thailand
2009	World Bank: Country Social Analysis: Ethnicity and Development in Vietnam. WB Social Development Unit.	Background on ethnic groups in Vietnam.
2008	ADB: Lao Peoples Democratic Republic: Sustainable Natural Resource Management and Productivity Enhancement Project.	Proposed Asian Development Fund Grant and Technical Assistance

		Grant. Project Number: 37579-03. Background information on natural resources in Lao PDR.
2008	Corey-Boulet, R.: Emerging trends threaten health gains. Phnom Penh Post. February 27. 2008	Background info on health issues in Cambodia
2008	International Rivers: Power Surge: The Impacts of Rapid Dam Development in Laos.	Background on hydro-power development in Lao PDR.
2008	IRN and NGOF: Cambodia's Hydropower Development and China's Involvement.	Background on hydro-power development in Cambodia.
2008	IUCN: Fish, frogs and forest vegetables: Role of wild products in human nutrition and food security in Lao PDR. Joost Foppes.	Document on food security in Lao PDR.
2008	Environmental Management Plan (EMP). Lower Sesan 2 Hydropower Project, (draft). Key Consultants Cambodia, Phnom Penh, June 2008.	Environmental management plan for a specific hydropower dam in Cambodia.
2008	Key facts Sesan II dam for NGO meeting 27 June 2008. Key Consultants Cambodia, Phnom Penh, 3 pp	Background on Sesan 2 hydropower dam in Cambodia.
2008	Ministry of Health, Lao PDR: National Nutrition Policy.	Info on food security in Lao PDR.
2008	Lower Sesan: Main parameters of Lower Se San 2 Hydro-power Project.	Report on specific hydro-power project in Cambodia.
2007	Chanthay, S (The NGO Forum on Cambodia): The Kamchay Hydroelectric Dam. Brief Paper.	Info on a specific hydro-power dam in Cambodia.
2007	Hanssen, C.H.: Lao Land Concessions, Development for the People? Paper presented to the International Conference on Poverty Reduction and Forests: Tenure, Market and Policy Reform (Bangkok, Thailand: 3-7 September 2007).	Background on land and resettlement issues in Lao PDR.
2007	NGO Forum: NGO Position Papers on Cambodia's Development in 2006: monitoring of Joint Monitoring Indicators and Implementation of National Strategic Development Plan 2006-2010. Phnom Penh, June 2007.	Various background info on development issues in Cambodia.
2007	Oopatham Pawaputanon Na Mahasarakarm: An Introduction to the Mekong Fisheries in Thailand. Mekong Development Series No.5, Mekong River Commission, Vientiane,	Background on fisheries in Thailand.

	Laos PDR. 54 pages	
2007	UN-OHCHR: Economic Land Concessions in Cambodia: a human rights perspective. UN Cambodia Office of the High Commissioner for Human Rights.	Land issues in Cambodia.
2007	Eric Baran, Teemu Jantunen, Chong Chiew Kieok (Worldfish Center): Values Of Inland Fisheries in The Mekong River Basin.	The study gives an overview of each GSM country's economic, fisheries and social situation then details the values documented for river fisheries in each country.
2006-10	Pongsri, C. and Sukumasavin, N.: National Aquaculture Sector Overview. Thailand. National Aquaculture Sector Overview Fact Sheets. In: FAO Fisheries and Aquaculture Department [online]. Rome. Updated 1 February 2005. [Cited 6 May 2010]. http://www.fao.org/fishery/countrysector/naso_thailand/en	Info on aquaculture in Thailand.
2006	Biddulph, Robin: Landlessness, Land Redistribution and Justice in Rural Cambodia. NIAS Nytt, 700+ words	Background info on land issues in Cambodia.
2006	Kusakabe, K. et al (World Fish Center): Women in Fish Border Trade: The Case of Fish Trade Between Cambodia and Thailand. In Global Symposium on Gender and Fisheries: Seventh Asian Fisheries Forum.	Study of fisheries in Cambodia and Thailand.
2006	NGO Forum on Cambodia: Indigenous Peoples in Cambodia.	Info on issues related to ethnic groups in Cambodia
2006	Rigg, J.D.: Forests, Marketization, Livelihoods and the Poor in the Lao PDR. Land Degradation and Development 17 (2006), pp. 123-133.	Background paper on forestry and livelihoods in Lao PDR.
2006	World Bank: Cambodia. Halving poverty by 2015? Poverty Assessment 2006. The World Bank, Phnom Penh, p.17	Poverty issues in Cambodia.
2006	Laos PDR: Comprehensive Food Security and Vulnerability Analysis (CFSVA). WFP, November, Draft	Main study on food security in Lao PDR.
2005	FAO: The Kingdom of Cambodia: General Economic Data.	General socio-economic data on Cambodia
2005	NGO Forum: Fastwood Concessions: Economic Concessions and Local Livelihoods in Cambodia: field investigations in Koh Kong, Kampong Speu, Pursat, Mondulhiri, Prey Veng and Svay Rieng provinces. NGO Forum. Environmental Forum Core Team, Phnom Penh, August 2005	Case studies of effects of land concessions in Cambodia.

2004	Chaudhry, P. and Juntopas, M.: Water, Poverty and Livelihoods in the Lower Mekong Basin. Basin Development Plan Working Paper	BDP produced working paper on social issues in LMB.
2004	MAF, Lao PDR: Gender, Forest Resources and Livelihoods. National Agriculture and Forestry Extension Service. Sustainable Forestry And Rural Development Project.	Background info on livelihoods relating to forestry in Lao PDR.
2004	World Bank: A Fair Share for Women. Cambodia. Gender Assessment. The World Bank. Phnom Penh, p. 60	Gender issues in Cambodia.
2003	Where do you go? – Migration and Urbanisation in Cambodia, WUP-FIN Socio-economic Studies on Tonle Sap. Haapala, Ulla. 9, MRCS/WUP-FIN, Phnom Penh.	Background info on migration in Cambodia.
2003	MIME and CNMC: Hydropower. National Sector Review.	Hydropower sector review of Cambodia.
2003	Van Brakel, ML. Muir, JF and Ross, LG.: Modelling for Aquaculture Related Development, Poverty and Needs in the Mekong Basin'. Institute of Aquaculture, University of Sterling.	Background on aquaculture related development.
2002	Prompakping, B.: Village economy in Isaan during the last five decades since the end of World War Two: A case study of Ban Tha. Office of Research Support Fund (Sor Gor Wor).	Study of socio-economic development trends in Issan.
2002	World Bank: Operational Policy on Involuntary Resettlement (OP 4.12). World Bank, Washington D.C.	Reference document related to resettlement.
2001	Sjorslev, J.G. (Ed.): An Giang Fisheries Survey, Assessment of Mekong Fisheries Component. (AMFC)/Mekong River Commission (MRC) MRC and Research Institute for Aquaculture 2 (RIA 2, HCMC, Vietnam); Vientiane.	Fisheries survey from Mekong Delta, Viet Nam, covering 1000 households, socio-economic status and fisheries practices.
2001	Sjorslev J.G.: Assessment of consumption of fish and aquatic animals in the Lower Mekong Basin. Draft report for the Mekong Development Series. 35 pp.	Background study for Hortle KG (2007) Consumption and the yield of fish and other aquatic animals from the lower Mekong basin. MRC Technical Paper 16: 1-88.
2000	MAF, Lao PDR: Lao PDR Food Security Strategy in the Period of 2001-2010.	Food security in Lao PDR.
2000	Oliver, R.: International Trade and Food Security in Asia. Asia Productivity Organization (APO): Tokyo. 340 pages	Background on food security in general.
2000	Sjorslev, J.G. (Ed.): Luangprabang Fisheries Survey, Assessment of Mekong Fisheries Component (AMFC)/Mekong Riv-	Fisheries survey of 127 households covering so-

	er Commission (MRC) and Living Aquatic Resources Research Center (LARReC)/NAFRI; Vientiane, 2000	cio-economic status and fisheries practices
1998	ADB: Handbook on Resettlement: A guide to good practice. Asian Development Bank, Manila, 115 pp.	Reference for resettlement issues and data requirements

Attachment 2 – Comments and Responses Regarding Socio-Economics Data in the ISH11 Report

The comments below are those relating to socio-economics arising from ISH11 regional and national consultations, MRC Programmes consultations and technical workshops.

MRC Data Sources and Member Country Data Sources

Comment: Sources for the socio-economic monitoring for hydropower information go beyond those being collected for the BDP socio-economic database and SIMVA; other socio-economic data sources in the MRC include FP, FMMP, AIP and other programmes.

Comment: National statistics agencies do not collect data on all the ISH11 priority socio-economic parameters; a number are collected from other ministries.

Response: It has been the case in the past that MRC programmes collected socio-economic information independently and in an uncoordinated manner. The results have been duplication of efforts in obtaining general socio-economic official statistical data, and existence of spatially fragmented databases from sector specific surveys. Since most of these surveys, except SIMVA, have been one-off, and will not be repeated in the same manner, they are difficult to use for monitoring purposes. Hydropower relevant socio-economic parameters have been included in the list of indicators for the socio-economic database. Some of these data will have to come from line agencies such as ministry of energy as they are not routinely submitted to the national statistical agencies. This is discussed in Section 4.4.3 in Annex.

Locations

Comment: Since the socio-economics data need is only for areas along the Mekong mainstream and some tributary locations, it is suggested to delineate the targeted area so that the necessary data can be compiled accordingly.

Response: The socio-economic database aims to cover the whole basin, thus including the Mekong mainstream. It does not make sense to collect official statistics only from say Districts along the Mekong, as most of the same parameters will also have to be collected from all other Districts. SIMVA specifically surveys the mainstream corridor and the areas on the floodplains in Cambodia and the Mekong delta.

Navigation

Comment: Navigation is an important sector for some Member Countries and closely linked to hydropower considerations, and should be considered in the socio-economics parameters.

Response: Included in the navigation parameters in the socio-economic database list of indicators is the following (with their tentative numbering in the database):

10.1 Net economic value of navigation; 10.2 Navigable days by class; 10.3 Quantity of Cargo in upstream parts of the Mekong; 10.4 Quantity of Cargo in lower parts of the Mekong; 10.5 Volume of freight; 10.6 Number of passengers; 10.7 Number of registered vessels, pilots, skippers.

Agriculture and Parameters

Comment: Is ISH11 going to consider agricultural activities in the area of hydropower plants, particularly downstream, and the implications of HPPs to agriculture?

Comment: The parameter lists appear comprehensive. Some of the socio-economic parameters need to be much more specific, e.g. relating to agriculture-related information (crop types, areas, yields, etc).

Response: Yes, the socio-economic database has an extensive list of agricultural indicators and other related, as follows (with the tentative numbering in the database): 2.2 Nos and % HHs engaged in agriculture as primary or secondary occupation or economic activity; 3.1.4 HH ownership to land; 3.1.9 Household income: proportion of income from water resource related activities; 3.1.10 Damages to HH from floods and droughts; 8.1 Rice area harvested; 8.2 Rice production; 8.3 Rice yield; 8.4 Water productivity of rice; 8.5 Unit yield per rice production (t per ha per crop); 8.6 Total irrigated area; 8.7 Actual area with 2 or 3 crops per year; 8.8 Total irrigated cropped area; 8.9 Value of agricultural production; 8.10 Monthly net surface withdrawals for irrigation; 11.1 Net economic value of flood damage; 11.2 Economic value of flood control.

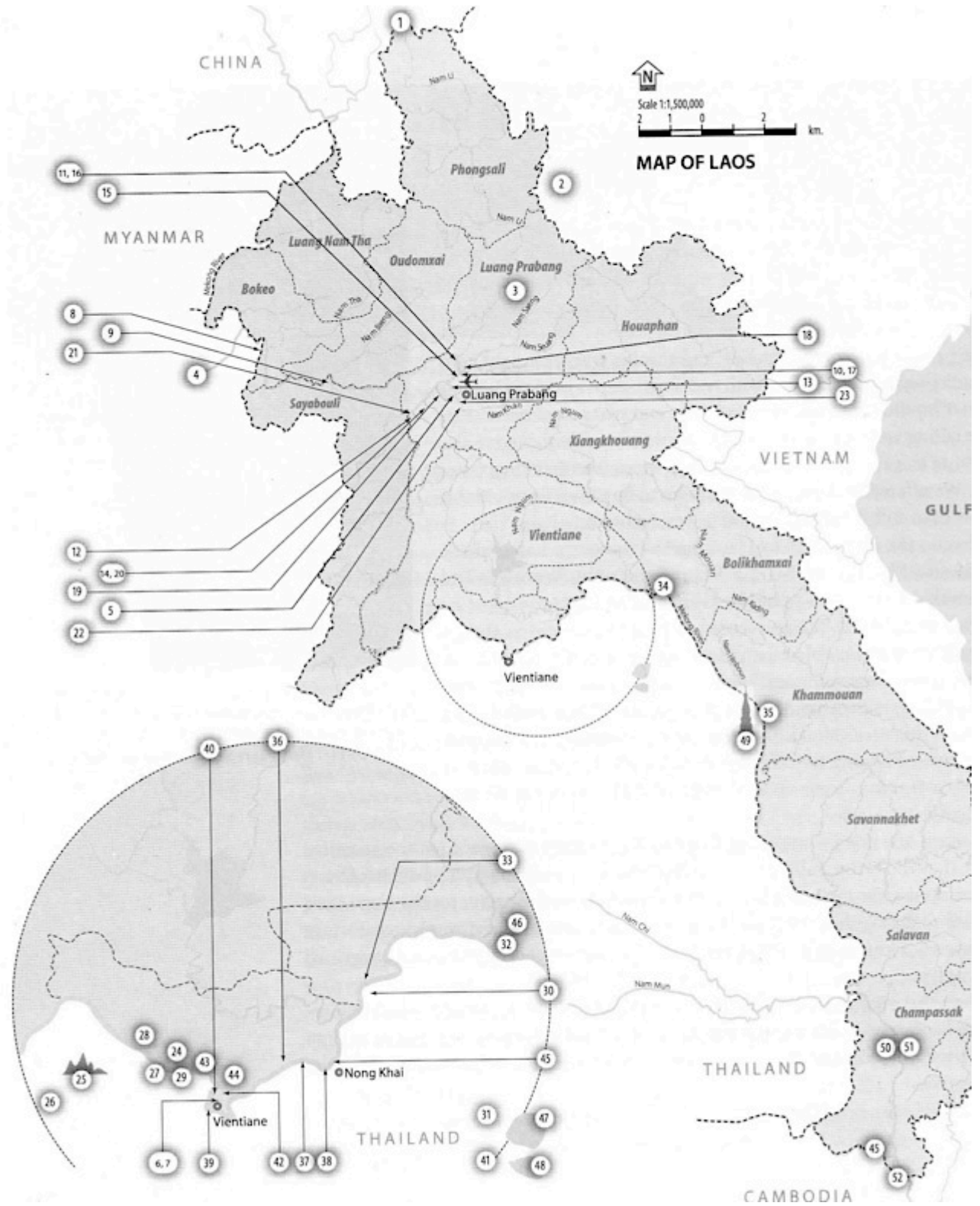
Historical versus Future Data

Comment: The BDP socio-economics database is focussed on receiving the most updated data; how will the ISH11 team deal with collecting and compiling historical socio-economic data important to hydropower?

Response: This is discussed briefly in Section 4.5. Refer also to Scoping Report for Establishment of a Socio-economic Database, December 2013. In the establishment phase of the socio-economic database the most recent data will be collected. Once the system for retrieval from national database has been tested and is functioning the aim is to populate the socio-economic database further with historical data.

Attachment 3 – Sacred sites on the Mekong and tributaries in Lao PDR

Reproduced without permission from the book: 'The Enduring Sacred Landscape of the Naga', by Mayoury and Pheuiphanh Ngaosrivathana, 2009.



Locations on the Map

Dwelling Places of the Naga Lords and Other Sacred Sites Ancient Lao civilization sites

1. Nong Sae (Nong Kasae Saen Yaan), northern reach of ancient Lao civilization; original home of the Naga Lords
2. Dien Bien Phu (Muang Thaen), site where the seven sons of the legendary T'ai ruler of Laos Khun Borom settled
3. Muang Ngoi, area possibly ruled by Khun Borom's second son; razed during the war of the 1960s and 70s
4. Menam Ping (Phin River), the naga Phinthayonakhavattinag gave his name to this river
5. Ban Nounsavath (Ban Noun), likely the ancient center of Muang Swa, today's Luang Prabang
6. That Luang stupa, likely the center of Nong Khan Thae Phi Seu Nam, today's Vientiane
7. That Luang marsh, also likely part of Nong Khan Thae Phi Seu Nam; a preferred spot of the naga Setthasayanag

Sacred river mouths of Luang Prabang

8. Pak Tha
9. Pak Baeng
10. Pak Seuang
11. Pak U
12. Pak Mood
13. Pak Khan
14. Pak Nam Dong

Original sacred abodes of Luang Prabang *naga*

15. Tham Ting caves (Pha Ting)
16. Sop U
17. Sop Seuang
18. Saen Khao Kham
19. Sop Hop
20. Sop Dong
21. Pha Kab Kae Tang Nai (Pha Tad Kae)

Sacred abodes of Luang Prabang's progenitors

22. Phou Suang (Tham Phou Suang/Luang Suang), abode of python progenitor Phaya Ngu Luam
23. Ptiou Sang, abode of ngeuak progenitor Nang Phaya Ngeuak

Phou Couvien Settlement- Home of the Naga Lords after their expulsion from Nang Sae

24. Doi Nantha Kang Hi, abode of Naga Lord Suvannanag on the eastern bank of the Mekong; the Buddha is said to have seen a seven-headed naga on this hill
25. Phu Phrabat Historical Park (Phou Couvien/Suvannaphum), abode of Naga Lord Suvannanag on the western bank of the Mekong; one of fourteen settlements belonging to the Sikhottabong Empire
26. Nong Bua Ban lake, marking western edge of Phou Couvien settlement; abode of Naga Lord Phutthothapanag
27. Phrabat Veun Coom (Phrabat Khuak Suak), Buddha footprint marking eastern edge of Phou Couvien settlement

Dwelling places of selected Naga Lords and some of their fellow *naga*

28. Vat Hin Mak Peng, today a site of the naga fireballs
29. Ban Ang, today a site of the naga fireballs
30. Phonphisai, today a site of the naga fireballs
31. Wat Kham Chanot, one of the abodes of Naga Lord Sisotho (also known as Sukhanthanag)
32. Phrabat Veun Pa (Vuen Load), possibly the abode of Naga Lord Sookhhattinag
33. Veun Souk, abode of Naga Lord Khahatthinag (and Naga Lord Sookhahattinag, as some believe)
34. Khong Kham (Muang Pak Chao), abode of Sathon, King of the Ngeuak
35. Muang Sikhottabong , abode of the naga Thanamunlanag

Auspicious Vientiane sites protected by the *naga*

36. Tha Nam Neua landing, abode of the naga Khanthapphanag
37. Tha Nam Tai landing, abode of the naga Sitthiphokhanag
38. Tha Phan Phao landing (Hua Hong), frequently visited by the naga Sahatsaphalanag
39. Haad Sai Fong sand beach (Haad Sai Pho Lam Neung), one of the preferred spots of the naga Setthasayanag
40. Khok Kham river rock (near Tha Phalansay landing), abode of the naga Sirivathanag

Sites associated with Burichan Uai Luai, anointed by the *naga* as Vientiane 's first ruler

41. Muang Nong Han, Burichan Uai Luai's birthplace
42. Ban Fay (Hong Sakae), site of settlement founded by Burichan Uai Luai
43. Nong Chan marsh, named after Burichan Uai Luai
44. Ban Chiempang village, likely named after Goddess Nang Inthasirichiempang , Vientiane's chief deity, who together with Naga Lord Suvannanag helped arrange Burichan Uai Luai's marriage to Nang Inthasavanglonghod
45. Muang Sirichiempang, former muang in southern Laos probably named after Goddess Nang Inthasirichiempang but no longer exists

Other sacred sites

46. Phrabat Phonsan, one of the most sacred Buddhist sites in Laos said to shelter a Buddha footprint left at the request of a naga
47. Nong Han Luang lake, created by the naga Thanamunlanag
48. Nang Han Noi lake, created by the naga Kutthothapapanag
49. That Phanom, 5th century reliquary sacred to the Lao and north-eastern Thai; protected by ngeuak Ai Tong Kwang
50. Vat Phou temple, adorned with ngu suang, an invisible man-eating mythical serpent; one of the most sacred sites in Southeast Asia
51. Huai Torno, site where ngu suang appear
52. Li Phi (Ko Khinag), dam built by a naga lord

Note: Parenthetical material refers to older and/or alternative place names.