

# **Water management and impact assessment in the Mekong Basin: analyzing the linkages between local, national and regional levels**

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## **Abstract**

Mekong River in Southeast Asia is among the greatest rivers of the world. Altogether six countries –China, Burma/Myanmar, Thailand, Laos, Cambodia and Vietnam– fall partly within its basin. The river basin is currently facing rapid changes, including intensive plans for water development projects. While the different water development projects –most notably the construction of large hydropower dams– are considered important for countries' economic development, also the negative impacts that they are likely to cause for ecosystems as well as for livelihoods of millions of people are estimated to be huge. Despite the potentially remarkable environmental, social and economic impacts, the existing impact assessment processes in the basin are relatively poorly coordinated, and seem in many cases not really be able to capture properly the actual scale of the impacts at different levels.

This article first looks at the different impact assessment processes in the basin, and then discusses the challenges related to them. Based on these existing challenges, it is argued that in this kind of dynamic and complex setting, there is a need to shift from pre-defined, top-down impact assessment approaches that currently dominate the basin towards a more flexible approach combining assessments from local level up to the regional level and applying truly interdisciplinary approach in its analysis.

## 1. Introduction

Mekong River in Southeast Asia is among the greatest rivers of the world: it is estimated to be 10th largest in the world both in terms of its total length of 4909 km and mean annual flow of 475 km<sup>3</sup> (Shaochuang 2007; MRC 2005). Altogether six countries –China, Myanmar, Thailand, Laos, Cambodia and Vietnam– fall partly within its basin (Fig. 1).



**Fig. 1. The map of the Mekong Basin (map by Matti Kummu).**

The Mekong River Basin is currently facing rapid changes: population is growing and urbanizing and riparian countries' economies are developing rapidly. Yet at the same time disparities are growing both between and within the countries, and water and related resources are under increasing pressure. While the on-going and planned water development projects –

most notably the construction of large hydropower dams— are considered important for countries' economic development, the negative impacts that they are likely to cause for river-dependent ecosystems and for livelihoods of millions of people are estimated to be huge (see e.g. IUCN et al. 2007a; MRCS/WUP-FIN 2007a; MRC 2006a). In addition, the benefits and losses related to water development are in many cases to be felt in different countries, making water development in the basin also a sensitive transboundary issue.

Consequently, together with the plans for water development, concerns about the negative environmental and social impacts of this development are increasing. Still, the discussion about the development plans and their potential impacts remains weak. What is even more worrying is that no-one seems really to possess the knowledge about the kind of cumulative impacts the different development plans are actually going to have in different parts of the basin. Although there are several different impact assessments undertaken in the basin, their estimates range remarkably (see e.g. Kummu & Sarkkula forthcoming) and particularly the basin-wide impact assessments face several challenges. Additional challenge is that many of the development processes are not particularly transparent, and as a result information available on different plans is rarely enough for proper cumulative impact assessment to take place – at least on time i.e. before the plans are actually realized.

This article argues that in this dynamic and complex setting, there is a need for more comprehensive, multi-level impact assessment process. Based on practical experience from different parts of the basin it is shown that a regional level impact assessment that includes thorough analysis of local complexities is often more coherent and also better focused on most relevant issues. At the same time, many of the challenges linked with more macro-scale, top-down impact assessment approaches became less severe. The impact assessment process in this kind of large, transboundary basin should also not be built around just one discipline –be it hydrological, environmental, economic or other field– but it should be truly interdisciplinary, looking innovatively for new approaches. There is also a need for more transparency in both development plans and their impact assessments to really facilitate discussion –both in national and in regional level– about the development impacts, and ultimately about the trade-offs following from the planned development.

## **2. Mekong is developing – where is the information and discussion about the impacts?**

The Mekong River system is home to a high variety of fish and other aquatic species, and the fishery in the basin is believed to be one of the largest and most significant in the world (Poulsen et al. 2004). The Mekong also supports a variety of wetlands and floodplains and provides water for agriculture that forms the main source of livelihood in rural areas (MRC 2003). These water-related resources support majority of the basin population, many of whom are poor. The on-going and planned water development projects, most notably the construction of large-scale hydropower dams and irrigation projects, are likely to cause remarkable changes for the availability of these resources, and consequently for the livelihoods of millions of people (MRCS/WUP-FIN 2007a, 2007c; IUCN et al. 2007a). Yet, open discussion about the basin development and its potential impacts is strikingly absent in the region, and even the information on the development plans and their impacts remains largely insufficient.

The lack of information on and discussion about the water development plans can be linked to the challenges with water governance as well as to the issue of scales. In terms of governance, none of the riparian countries in the region is truly a democratic one, and the planning and decision-making processes remain often non-participatory and non-transparent. This is particularly the case in many water-related sectors such as hydropower, roads and large-scale irrigation that require considerable amount of financial capital and are thus focus of major investments by donors, development banks and, increasingly, private sector. In particular the growing involvement of private sector in water development plans in the basin has increased concerns about the transparency of and actual motivations for these projects. Due to the crosscutting nature of the water and its crucial importance for people's livelihoods, management of water resources also falls under several different ministries and institutes. Both vertical and horizontal discontinuities and even institutional rivalries follow, making water governance particularly challenging to coordinate (Keskinen et al. 2007; Sokhem & Sunada 2006).

The issue of scales includes both spatial and temporal dimension. The overall challenge with scales is that the impacts of water developments in the Mekong Basin are –like in any other transboundary river basin– essentially felt in the local level, but coordinated decision-making and impact assessment requires regional approach. As a result, many of the regional impact assessment focus on macro-scale analyses that oversimplify and even misrepresent the actual impacts on the ground. In addition, the im-

pacts felt due to basin developments may be radically different depending on the time scale used, with longer-term impacts usually being more difficult to assess.

### **2.1. Mekong River Commission (MRC)**

In terms of water-related impact assessment in the basin, the most relevant regional coordination body is the Mekong River Commission (MRC)<sup>1</sup>. The MRC aims to guide balanced water resources development in the basin, and it was established in its current form in 1995 by four downstream countries of Laos, Thailand, Cambodia and Vietnam (MRC 1995). The Commission's task is, however, challenged by the absence of China, the most upstream country with massive plans for hydropower development in the Mekong mainstream. The MRC has also its own, internal challenges; many consider the Commission to be too insensitive to local realities, too technically orientated and not transparent enough to really facilitate open discussion about the development plans, their impacts and consequent trade-offs (see e.g. Backer 2006; Hirsch et al. 2006; Phillips et al. 2006; Sneddon and Fox 2006; Keskinen et al. forthcoming).

Perhaps the biggest challenge of the MRC is that despite the often highlighted will by riparian countries' governments for coordinated development in the basin –labeled even as “the Mekong Spirit” (Nakayama 1999)–, the MRC is in reality being increasingly sidelined from the actual planning processes of large-scale water development in its member countries. Particularly in the biggest member countries, Thailand and Vietnam, the Mekong and its cooperation seems to stand in a real periphery in terms of national plans<sup>2</sup>. While this is in a way understandable as only relatively small parts of the two countries fall within the basin and they thus have not so much to gain, or lose, from the Mekong cooperation, the paradox is that Thailand and Vietnam are regularly also the most vocal countries in the Commission, often hindering its operations. At the same time the political elites of all riparian countries seem to share similar aspirations for economic development, and development plans' potential negative local level impacts are thus not always even taken properly into consideration in the

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<sup>1</sup> Other regional cooperation mechanisms that have water-related activities include the Greater Mekong Subregion (GMS) Programme, the Association of Southeast Asian Nations (ASEAN) as well as different kinds of research and NGO networks such as the M-POWER. Also several more focused cooperation arrangements exist. For more information, see e.g. Keskinen et al. (forthcoming).

<sup>2</sup> When I recently asked about the role of the MRC in Thailand's water-related development plans, a Thai academic well knowledgeable about the situation both in the MRC and Thai government replied that “the MRC does not matter in Thailand at all – not at all”.

national and regional level discussions – be it at the MRC or elsewhere (Keskinen et al. 2007).

## **2.2. Different impact assessment approaches**

While the available information about the potential impacts of Mekong development remains relatively insufficient, it does not mean that there would not be impact assessment processes on the way in the basin. On the contrary; there actually exist several initiatives to assess the development impacts in the basin. Numerous impact assessment (IA) methodologies have been applied and even more proposed by different actors such as the MRC and the Asian Development Bank. Most of these impact assessments have focused on basic hydrological assessments and common Environmental Impact Assessments (EIA), but also broader, strategic assessments drawing e.g. on Cumulative Effects Assessment or Strategic Environmental Assessment have been proposed.

Within the MRC, the most important program for impact assessment is the Basin Development Plan (BDP) which entered its second phase in 2007. Despite for over decade of functioning, the MRC does not, however, have a common impact assessment approach that would be applied systematically and in coordinated manner. Instead, the BDP and other MRC programs such as Water Utilization Programme (WUP) and Environment Programme (EP) have been developing and applying several different kinds of IA methods over the past years, often with relatively poor coordination between the programs. Most of the proposed and used IA approaches build on the hydrological information provided by the MRC's Decision Support Framework (DSF).

Different IA methods proposed within the MRC vary rather remarkably in both their approach and scope. Within the BDP, for example, at least Environmental Assessment system and Social Impact Assessment system making use of Social Development approach have been proposed and developed (ERM 2002; Chaudhry 2004; MRC/BDP 2005). IA methods proposed within the Environment Programme include e.g. Social Impact Monitoring and Vulnerability Assessment (Fisher et al. 2006; MRCS/WUP-FIN 2007b). Finally, one of the broader IA approaches being developed within the MRC is the Integrated Basin Flow Management (IBFM) process that has been developed under WUP and EP (MRC 2006b). Common to most of these approaches is that they are planned in a relatively top-down manner, their design is usually based on rigid, pre-defined structures and they make mainly use of macro-scale data available at relatively high levels such as provincial or even national level.

## 2.2. Example of cumulative impact assessments: impacts to the Tonle Sap water level

Due to a large variety of different development plans and the complexity of the interconnections between hydrology, ecosystems and livelihoods, the prediction of cumulative impacts in the Mekong Basin is extremely challenging. For example, existing cumulative impacts assessment (CIA) studies focusing on flow changes apply somewhat different approaches with different raw data, and provide therefore differing estimates for potential flow alterations. This is well captured in Table 1 that presents a summary of three different cumulative impact studies as presented in Kummu & Sarkkula (forthcoming). The table focused on predicted impacts to one of the most critical ecosystems in the basin, the Tonle Sap Lake of Cambodia. The CIA studies included in the table include:

- CIA 1 by the Mekong River Commission (MRC); developed under its IBFM process and using the Decision Support Framework modelling tools in its predictions
- CIA 2 by the Asian Development Bank (ADB); basin-wide CIA conducted as part of the environmental impact assessment study of the Nam Thuon 2 Dam in Laos
- CIA 3 by Adamson; compiled analysis of the downstream hydrological impact of the planned Chinese dams

*Table 1. Summary of predicted flow changes according to different cumulative impact assessments (CIA). Source: Kummu & Sarkkula (forthcoming). Note: \* = only reservoirs planned in China considered.*

	<b>CIA 1: MRC</b>	<b>CIA 2: ADB</b>	<b>CIA 3: Adamson</b>
<b>Basic assumptions and methods</b>			
Increased storage in the basin	49.5 km <sup>3</sup>	54.9 km <sup>3</sup>	22.7 km <sup>3</sup> *
Increased irrigation	+ 53%	–	–
Other development activities taken into account	Increased domestic and industrial usage of water; basin diversions	Increased domestic and industrial usage of water	–
Method used to estimate the devel-	Hydrological and hydrodynamic	Water balance and hydrody-	Statistical analysis

Development impact on flow alterations	model	dynamic model	
<b>Changes in water levels of Tonle Sap Lake, Cambodia</b>			
Wet season water level	- 0.36 m	- 0.54 m	N/A
Dry season water level	+ 0.15 m	+0.60 m	+ 0.30 m

The differences between the different CIAs in predicted flow changes illustrate well the basic challenges with the impact assessment in the Mekong Basin. While the difference of few dozens of centimeters in the estimated dry season water levels of the Tonle Sap Lake may at first sight seem rather insignificant, this variation in estimates does actually have a remarkable difference for the flooded forests of the Tonle Sap. Depending on different estimates, up to over 40% of the remaining flooded forests would be permanently submerged – in essence destroyed, having dramatic impacts both for the ecosystem and the livelihoods (Kummu & Sarkkula forthcoming; Keskinen et al. 2007). The different impact assessments thus provide dramatically different estimates about potential environmental, social and economic impacts, and consequently, about the trade-offs resulting from basin development.

It is also critically important to remember that the impact assessment studies of Table 1 present only the very first step for actual assessment of potential environmental, social and economic impacts in the basin. A river is more than a hydrograph, and the estimations about hydrological changes cannot thus be used to draw direct conclusions about ecological and social impacts (IUCN et al. 2007b). Instead, proper environmental and/or social impact assessments require consideration of much broader themes and their linkages – an approach that is still dominantly lacking in the basin.

### **3. Challenges for basin-wide impact assessment in the Mekong Basin**

Previous chapter demonstrates that the lack of coherent information about the development impacts in the Mekong Basin is not due to the lack of impact assessment approaches *per se* – actually vice versa. Why then the existing impact assessment approaches are not providing enough information about the impacts likely to occur in different parts of the basin?

The main challenge for the impact assessments in the basin is that few of the existing approaches are able to assess reliably the impacts in different levels. Instead, most of the existing assessments either focus on the impacts in a relatively small area –for example in a part of a tributary or even within a village–, or look at the impacts at a very high level, focusing on costs and benefits of studied projects e.g. on provincial or even only on national level<sup>3</sup>. These two approaches are rarely combined or even analyzed systematically together. As a result, very few existing impact assessment approaches are actually able to assess the impacts in a manner that would be consistent at the basin-wide level and at the same time would not oversimplify, or even misrepresent, the impacts at the lower levels.

As was discussed above, majority of current basin-wide impact assessment approaches build on top-down approaches that are mostly based on rigid, standardized structures and methods and make predominantly use of macro-level data (MRCS/WUP-FIN 2007b). However, based on practical experience from different impact assessments within the basin as well as on the review of different impact assessment approaches proposed for the region<sup>4</sup>, some key challenges for this kind of approach can be recognized. Next, five most relevant –and, I believe, most common– challenges are discussed in more detail.

### **3.1 Challenges with data reliability & local level diversity**

A great majority of the basin-wide analyses and assessments applied in the Mekong Basin build –quite naturally– on available macro-scale social, economic and environmental data from the region, with data usually available only at national and/or provincial levels. There are, however, several cases where the comparison of this macro-level data with information available from local level has indicated that severe biases and even errors in the data (see e.g. Keskinen 2006; MRCS/WUP-FIN 2007b, 2007c).

These biases seem to be mainly due to misrepresentations and simplifications that scaling up of the data causes as well as due to biases in the actual enumeration methods (Keskinen 2006). The experience from different case studies (MRCS/WUP-FIN 2007b) strongly indicate that local level

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<sup>3</sup> Commonly (and quite logically), the former kind of assessments are carried out e.g. by NGOs and/or researchers, while the latter, more regional assessments are mainly applied by the regional organizations such as the MRC.

<sup>4</sup> This experience has been gained through academic research activities and different consultancy projects since 2002, and it covers four Lower Mekong Basin countries of Cambodia, Laos, Thailand and Vietnam. Most important and influential consultancy work has been that within the WUP-FIN Project under the MRC. For more information on the project, have a look at <http://www.eia.fi/wup-fin>

analyses –building on both quantitative and qualitative information– help to reduce significantly the risk for misinterpretations of this macro-level data, and also facilitate the recognition of possibly missing, relevant indicators in it.

Following from this, it seems that many, if not most, of the current basin-wide impact assessments fail to capture properly the complexity and huge regional differences of social, cultural, economic, political, environmental and hydrological issues and their interconnections, and instead represents the different parts of the Mekong in a relatively similar manner. The simple fact that the Mekong Region is both geographically and culturally such an enormous area with great regional differences –both between and within the countries– indicates that the assessments relying on a macro-level data are likely to present overly simplified and ‘standardized’ picture of the this vast area. It seems that these kinds of regional impact assessment approaches offer little flexibility in their indicators or in their actual research methods, but instead they force –in the name of comparability and clarity– different areas into the same kind of format by using standardized and pre-decided indicators. While this ensures better comparability, a great deal about the actual diversity prevalent in the basin is lost.

### **3.2 Challenge with spatial and temporal scales**

The issue of scales has two dimensions; that of time and that of space. The challenge with spatial scales is that while the impacts of water developments in the basin are essentially felt in the local level, coordinated decision-making and impact assessment requires regional approach. Consequently, the scope of truly meaningful basin-wide impact assessments should thus extend from very local level to regional level and, in some aspects, even to global level<sup>5</sup>. In addition, the benefits and losses due to water development are often felt across the borders, making water development a delicate transboundary issue. Consequently, balanced planning of water development must assess and understand comprehensively the needs and potential impacts at different levels as well as the diverse linkages between these levels. It is also important to recognize that assessments in higher levels are always unavoidably simplifications of the complexities and diversities at more local levels.

The need for this kind of spatially multilevel assessment is further challenged with the issue of time scales; the impacts of water development plans tend to be different depending on the used time scale, with short-

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<sup>5</sup> For example the newly emerged drive for hydropower development in the region by national governments as well as by private sector can be linked to the increasing emphasis on renewable energy production to mitigate climate change.

term and longer-term impacts being potentially radically different. This is both due to differing responses to the occurring changes with some impacts being felt immediately (e.g. submersion of agricultural land due to hydropower dam construction) and others more slowly over the time (e.g. impacts to fisheries due to gradual habitat changes).

The issue of time must also be remembered when analyzing the estimation provided by different impact assessments. Cumulative impacts occurring over longer period of time due to different projects can be more dramatic than the estimated short-term impacts of a single project. However, the situation may also be vice versa; many cumulative impact assessments, for example, combine in their estimations hydropower and agricultural development, which typically leads the potential flow changes of these two developments to cancel each other out. This is, however, not necessarily true as the hydropower and agricultural projects are rarely planned in a coordinated manner, and the projects may thus be completed at very different times. Resulting from this, the short-term impacts of certain water developments may actually be radically different than those anticipated in cumulative impact assessment<sup>6</sup>.

### **3.3 Challenge with the orders of magnitude**

The third major challenge of basin-wide impact assessments is linked to the problem of realizing the actual orders of magnitude within the basin. Due to the diversities at the lower assessment levels, there is a natural need to focus the regional assessments to limited number of key issues for the assessments to be really implementable. Since this kind of selectivity leads unavoidably to simplifications and leaves out some important, locally relevant issues, the process of selecting the regional key issues needs to be particularly sound and transparent.

Successful selection of regional key issues requires in particular two things; sufficient knowledge about the diversities occurring at the local levels, and thorough understanding of the orders of magnitude. In terms of socially sustainable development of water resources, achieving the latter

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<sup>6</sup> An example: the first CIA by MRC presented in previous chapter includes not only hydropower dams but also increased agricultural water use in its scenario. This combined scenario is estimated to result in 15cm increase in dry season water level of the Tonle Sap. It is, however, very likely that the implementation of these two forms of water development will happen at different time scales, with hydropower development occurring first. This would lead to a situation where the dry season water level would actually be considerably higher than estimated in the years before irrigation projects included in the scenario would have been accomplished. In terms of flooded forest, already few years of higher dry season water level would leave to permanent destruction of the forest, notwithstanding what the final water level will be.

requires a systematic analysis of existing socio-economic information, with particular focus on the following questions: where most of the people –in particular the poorest– live in the basin; what are their main livelihood sources and possible alternative livelihood sources; and to what extent their livelihoods are dependent on different water-related natural resources. Information on all these questions needs to be collected from lowest possible level<sup>7</sup> throughout the basin, and then combined together for regional scale analysis.

Although this may sound to be even too obvious, it seems that for surprisingly many basin-wide impact assessments acknowledging and really understanding the orders of magnitude poses a real challenge<sup>8</sup>. As a result, many of the basin-wide impact assessments seem to be focusing on environmental and social issues that are actually not always the most relevant ones for the majority of the people in the basin (MRCS/WUP-FIN 2007b).

### **3.4 Challenge with the impacts to crosscutting issues**

The last major challenge related to current basin-wide impact assessment practices is related to the problem of assessing the impacts of different basin developments to particularly complex, crosscutting issues. The actual impact to these kinds crosscutting issues consists typically of an array of different, smaller changes that have both direct and indirect linkages with an issue of question. Consequently, successful impact assessment requires a comprehensive approach that integrates expertise from several different disciplines, and, in many cases, also requires entirely new kind of methods to assess the actual impacts.

A prime example of this kind of crosscutting issue within the Mekong Basin is the flood pulse system<sup>9</sup> of the Tonle Sap Lake and floodplains in Cambodia. The flood pulse of the lake is believed to be the main driver for ecosystem productivity of the lake and floodplains that provides source of food and livelihoods for millions of people in Cambodia (Keskinen 2006; Lamberts 2006). Consequently, assessing the possible impacts to the flood pulse is critically important from environmental, social as well as economic point of view. Yet, as discussed in great detail in Lamberts (forthcom-

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<sup>7</sup> This level is often commune and sometimes even household level.

<sup>8</sup> An example; the IBFM process of MRC is according to author's knowledge the first regional impact assessment that actually seeks to gain systematic, basin-wide data on where people dependent on river resources are actually located in terms of their actual numbers (MRC/IBFM 2006).

<sup>9</sup> Flood pulse is a term for an ecological paradigm integrating the processes of productivity in river-floodplain ecosystems, with a particular focus on the lateral exchange of water, nutrients and organisms between a water body and the connected floodplain. For more information, see Junk et al. (1989) and Lamberts (2006).

ing), the current environmental impact assessment practices fail to assess the actual impacts to such crosscutting processes, and thus fail to identify the full consequences of flow alterations for the Tonle Sap ecosystem<sup>10</sup>.

Another major crosscutting issue in the basin is, of course, fish that is not only environmental issue but also very much a social and economic issue due to its critical importance for food and income. Due to extensive fish migration both in the Mekong mainstream and between mainstream and tributaries, fish production is particularly vulnerable to flow changes – and for the same reason the actual social and economic impacts caused by decreased fish production may be felt in very different areas than where the decrease is caused.

#### **4. Way forward: multilevel, interdisciplinary approach for impact assessment**

While it is rather easy to list challenges of current basin-wide impact assessment practices, the real difficulty is to recognize how these challenges could actually be overcome – this chapter seeks to provide insights on this. First of all it is important to acknowledge that every case is different, and that also basin-wide impact assessment approaches should thus be context-specific, building on thorough understanding of the actual situation.

While this also means that there is no single solution that would provide answer to each and every challenge presented above, some general principles that make these challenges less severe can still be recognized and recommended<sup>11</sup>. Overall, practically all of the challenges described above are related to the issue of scales and to the problems with linking information from different levels together in a meaningful way. In terms of basin-wide impact assessment, particularly challenging seems to capture properly the diversities at the local level. Consequently, the most important recommendation to improve basin-wide impact assessment in the Mekong Basin is to shift from top-down, pre-defined impact assessment approaches that are currently dominating e.g. the MRC's work towards more flexible,

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<sup>10</sup> Based on the case study, Lamberts (forthcoming) also points out that it is currently possible to meet the environmental safeguarding requirements of the World Bank and the ADB without really assessing the actual impacts to integrative processes such as flood pulse.

<sup>11</sup> The recommendations provided in this chapter are largely based on the author's work on socio-economic and policy analyses and basin-wide impact assessment within the WUP-FIN Project, and supported by work carried out within the IBFM process as well as in so-called Built Structures Project. For more information on these, have a look at MRCS/WUP-FIN (2007a; 2007b), MRC/IBFM (2006) and Ratner et al. (2007).

multilevel impact assessments that make use of truly interdisciplinary approaches.

#### **4.1 Multilevel impact assessment**

What this kind of flexible, multilevel impact assessment would then in reality be? Based on the experience from different case studies (MRCS/WUP-FIN 2007a, 2007b), it can be concluded that a successful multilevel impact assessment should combine regional, macro-scale analysis with more detailed, local level assessments. The approach would thus make use of the strengths of both approaches, with macro-scale analysis providing the bigger picture and identifying the orders of magnitude, and the local level assessments capturing the complexities at the local level. To overcome the biases with quantitative data, the approach should also encourage utilization of both quantitative and qualitative research methods, particularly at the lower assessment levels (Keskinen 2006).

Ideally, the assessments at different levels are based on common impact assessment framework that defines already from the very beginning the main themes and the general working methods for the assessments. This kind of framework ensures that the assessments in different levels – although carried out flexibly based on specific context in each level– focus on same main themes, and that the results from the assessments in different levels can be compared. The social assessment framework proposed by the IBFM provides one promising example of this kind of approach (MRC 2006b).

In reality, however, there rarely is enough time and resources for an assessment that would include thorough analyses from the very local level all the way to the regional level. Consequently, it is also important to make much better use of already existing analyses –there already exist several analyses particularly at the local level–, and increase coordination between different assessments and analyses. Also in this case a common impact assessment framework helps to combine –and compare– the information available from different assessments better together.

#### **4.2 Towards interdisciplinary approaches**

Another major challenge for basin-wide impact assessments is the assessment of actual cumulative impacts of different development plans. Indeed, it seems that many of the current IA processes fail to properly assess these kinds of cumulative impacts due to their sectoral approach and/or their focus on selected plans and projects only (Lamberts 2006, forthcoming; MRCS/WUP-FIN 2007a).

Consequently, in order to address the cumulative impacts in a meaningful and truly integrated way, the impact assessment processes must shift from multidisciplinary approaches towards greater interdisciplinarity<sup>12</sup>. Multidisciplinary approach for impact assessment is getting more and more common also in the Mekong Basin, and it already provides a major step forward in impact assessment. However, multidisciplinary approaches are not going to challenge the dominance of sectoral approaches and lack of truly holistically views in impact assessments (MRCS(WUP-FIN 2007a, 2007c). Consequently, while multidisciplinary presents a promising start, the impact assessments need nevertheless to move towards greater interdisciplinarity in order to be successful also in assessing the impacts to complex, crosscutting issues such as flood pulse and fisheries.

Among the main challenges in truly interdisciplinary approaches seems to be the lack of understanding what the approach actually means. As a result, it is rarely really understood how much time and effort development of truly interdisciplinary approach requires, and not enough attention is given for a team to agree on its objectives, tasks and, overall, on the actual interdisciplinary approach. Setting up an interdisciplinary approach for impact assessment is a slow and evolving process, and time and patience as well as emphasis on team building should therefore be emphasized more than with the usual, single-disciplinary or even multidisciplinary approaches. In addition, the experts involved in interdisciplinary process must be ready to give up some of their 'disciplinary sovereignty', and to modify the methods and approaches they have used to apply within their own disciplines.

## 5. Conclusions

This article has discussed the current development of water resources in the Mekong Basin with a specific emphasis on basin-wide impact assessment practices and their major challenges. Related to these, recommendations for the way forward to overcome these challenges were provided as well. It can be concluded that instead of pre-defined, top-down impact assessment approaches that currently dominate the basin, a more flexible approach combining assessments from local level up to the regional level and applying truly interdisciplinary approach in its analysis should be used.

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<sup>12</sup> In this context, multidisciplinary approach means viewing the research topic from a variety of disciplinary perspectives, but yet producing set of disciplinary information on the topic by using common methods already available within each discipline. Interdisciplinary approach is seen to be more application-orientated, as it seeks to integrate both knowledge and methods from different disciplines into a novel interpretation to be able to better understand and assess a particularly complex, crosscutting problem.

The good news is that there already exist several different kinds of analyses and assessments of development impacts at different levels in the basin. The past and on-going assessment processes thus provide an enormous knowledge base both in terms of information on actual impacts and in terms of knowledge about the successes and failures of different assessment methods. Consequently, instead of building yet another entirely new impact assessment approach, there is a need for better coordination between the different assessment processes and, in particular, increased interaction between the assessments by different actors at different levels.

The kind of practical issues described above provide, however, only a starting point for a successful impact assessment. A truly meaningful impact assessment requires also the recognition of the highly political nature of water development, and consequently, of impact assessment. The impact assessment is thus not only about neutral numbers and estimates, but also very much about the values given –consciously and subconsciously– to different issues and impacts. Following from this, the impact assessment results are likely to be contested and interpreted differently by different actors and, due to omnipresent issue of uncertainty, their reliability is going to be questioned.

Consequently, all impact assessments should build on transparent processes, and include as an integral part an open dialogue with different stakeholders about the methods and assumptions used and the results achieved in the process. In the present context of the Mekong River Basin, there is thus a need for increased capacity to publish and communicate –in all riparian languages– both the principles and results of different impact assessments. These kinds of more open and transparent impact assessment approached would help to facilitate discussion –both in national and in regional level– about the development impacts and consequent trade-offs, and, ultimately, lead the way towards more balanced and integrated water resources management in the Mekong Basin.

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