Negotiating trade-offs in water resources development in the Mekong Basin: implications for fisheries and fishery-based livelihoods

Richard M. Friend\textsuperscript{a} and David J. H. Blake\textsuperscript{b}

\textsuperscript{a}Corresponding author. Mekong Programme on Water, Environment & Resilience (MPOWER), Unit for Social and Environmental Research (USER), Faculty of Social Sciences, Chiang Mai University, PO Box 144, Muang Chiang Mai 50202, Thailand. E-mail: richardfriend@hotmail.com

\textsuperscript{b}School of International Development, University of East Anglia, Norwich NR4 7TJ, United Kingdom

Abstract

A revitalised hydropower development narrative is emerging in the Mekong in which the concept of ‘trade-offs’ plays a central role. The importance of and risks to capture fisheries in the Mekong is such that any degradation has huge social, economic and environmental implications. While potential impacts of hydropower development on capture fisheries are acknowledged in this emerging narrative, it is argued that these are less than anticipated previously, that impacts can be assessed, mitigation measures introduced and trade-offs negotiated. The concept of trade-offs has an immediate appeal but it is also problematic. It draws attention away from considering development objectives and options towards focusing on impacts, and infers a technical approach as opposed to a political process of decision making. This paper draws on anthropological approaches to development policy to consider the implications of a hydropower narrative based on trade-offs in light of experience in the Mekong Basin, and to consider alternative ways of framing debate on hydropower and capture fisheries.

Keywords: Capture fisheries; Development narratives; Hydropower; Mekong Basin; Trade-offs

1. Introduction

Large-scale water resource infrastructure development, particularly hydropower, is back on the development agenda in the Mekong Basin. Inevitably, the refashioning of rivers and floodplains that these schemes will bring about will have an impact on the rich capture fisheries of the Mekong Basin, and on the livelihoods of the people who depend on these resources (Molle \textit{et al.}, 2009). These potential impacts have been keenly contested over the last decade, with fisheries concerns becoming a key element of campaigns against dams and similar projects. Along with this move towards more vigorous
promotion of hydropower there has been a noticeable change in the language of water resource debates. A new discourse is emerging that actively dismisses positions of the last decade as being ‘risk-averse’ and overly ‘precautionary’ (WB/ADB, 2006). It is argued that ‘trade-offs’ can be made as negative impacts will be less than previously expected, and that these can be identified, assessed and mitigated (e.g. Blackmore et al., 2004; WB/ADB, 2006)¹.

The term ‘trade-offs’ is central to this emerging agenda, appearing prominently in many of the documents, speeches and presentations. This marks a significant shift in the direction and content of water resource debates. Trade-offs has important resonance. It has both a technical and everyday commonsense meaning with positive connotations of making tough decisions in difficult circumstances through balance, reasonableness and compromise. It is therefore difficult to be against trade-offs, without taking the risk of sounding unreasonable or inflexible. The potency of the term lies in these key elements—the combination of the scientific, technical and commonsense with these positive connotations.

Our concern in this paper is not to provide a critique of any specific development strategy, but to consider the implications of taking the notion of ‘trade-offs’ at face value. The term itself, and the ways in which it is used are worthy of the kind of further scrutiny that have been applied to other keywords of development policy. Walsh (2004) has written on the value of applying anthropological approaches to policy analysis in order to scrutinize the use of the term ‘consensus’ as it is applied in the discourse of water resource management. The increasingly widespread, uncritical use of the term ‘trade-offs’ as a basis for water resource management in the Mekong Basin is worthy of similar scrutiny.

The use of the term ‘trade-offs’ is becoming more prevalent in water resource debates in the region and beyond, as reflected in this current collection of papers. This has occurred without serious critique. While trade-offs has an innate appeal, it is also problematic. Our concern is that discussing water resources management in terms of trade-offs narrows the scope for debate, research and negotiation by diverting attention away from assessing development objectives and options for meeting these, towards focusing attention on dealing with impacts of an established development agenda. This is all the more problematic when we consider capture fisheries in the Mekong. Capture fisheries are hugely important for rural livelihoods and national economies, and thus for addressing poverty reduction. There are concerns that impacts on capture fisheries of hydropower development across the basin could be on such a scale that assessment and mitigation would not be possible and thus trade-offs not viable.

This paper attempts to unravel the metaphors and language of emerging water resource policy initiatives by considering the underlying arguments of this shift in direction (Apthorpe, 1997) and by considering alternative ways of framing the hydropower–fisheries debate. This is most closely in evidence in initiatives led by the World Bank, the Asian Development Bank (ADB) and the Mekong River Commission (MRC), such as the Mekong Water Resources Assistance Strategy (MWRAS) that evolved into the Mekong Water Resources Partnership Programme (MWARP. However, the use of ‘trade-offs’ and the underlying arguments are not confined to these particular initiatives, and the drive for hydropower does not reside solely within these programmes. Hydropower is central to national development strategies for China and Lao PDR and a high priority in the other Mekong countries, with a range of private sector developers becoming involved (Molle et al., 2009).

¹ This paper was originally presented at the CPWF special session on trade-offs as part of the Vientiane Conference in 2006, and prepared for publication in 2007. While the paper has been updated to accommodate recent changes the original focus on the shift in development discourse in the Mekong that occurred in 2006 and 2007 remains.
This paper is based on both a discussion of shifting discourse through analysis of texts, speeches and presentations based on both authors’ participation in informal meetings, workshops and conferences, and also a review of experience of assessment and mitigation. The paper begins with a discussion of how anthropological approaches to policy analysis can be applied to a critique of this ‘trade-offs’ based narrative (Gasper & Apthorpe, 1996; Grillo & Stirrat, 1997; Shore & Wright, 1997; Walsh, 2004). The following section discusses shifts in the ways in which the relationship between hydropower and capture fisheries have been presented in the development literature. This is followed by a discussion of how trade-offs is both appealing and problematic within the current drive for hydropower development. The paper then moves on to assess the key arguments of the emerging trade-offs narrative, by considering the relationship between fisheries and poverty and with a discussion of the potential scale of impact of hydropower on capture fisheries. This is followed by a discussion of the capacity to predict potential impacts, drawing on two case studies, with a final session discussing feasibility of implementing successful mitigation. In conclusion, we consider whether alternative ways of framing water resource development might offer greater potential to meet the development challenges of the region.

2. Development narratives: views from policy analysis

The processes by which policy is produced, articulated and implemented have become areas for serious critical investigation from a range of social science disciplines. In particular, social anthropologists have taken on the challenge of considering policy processes and policy makers as the subjects of anthropological enquiry (Gasper & Apthorpe, 1996; Grillo & Stirrat, 1997; Shore & Wright, 1997; Brock et al., 2001; Walsh, 2004). Maintaining interest in the more traditional themes of anthropological enquiry, the metaphors, rituals, language, tools and practice of development policy are now keenly scrutinised.

By considering the shifts in discourse surrounding water resource development and fisheries in the Mekong, we attempt to respond to two of the questions posed by Shore & Wright (1997; p. 3):

*How are major shifts in discourse made authoritative? How are normative claims used to present a particular way of defining a problem and its solution, as if these were the only ones possible, while enforcing closure of silence on other ways of thinking or talking?*

Development policy aims to shape the world and generate change. In doing so, policy constructs versions of how the world is and how it should be. The language, speeches, reports, plans and other documents are essential tools for policy development and implementation (Apthorpe, 1997). Policy constructs what Roe (1995) has referred to as ‘development narratives’, complete stories with a beginning, middle and an end. For Johnson (2006; p. 751) ‘narratives...are broadly shared stories that structure perception and action and are normally subconscious, only being brought to the surface for analysis with considerable effort’. Such narratives are more than policy statements or policy documents. They are rather, the common threads of a story of description and prescription that permeate through the speech, statements and documents of policy. Development narratives help to ‘define problems and justify interventions’ (Fairhead & Leach, 1997, p. 35) becoming so pervasive that they convey a sense of conventional wisdom to the extent that the assumptions and arguments...
on which they are based are rarely challenged. Roe (1995) has addressed ‘crisis narratives’—a crisis scenario, with limited empirical justification that necessitates specific policy interventions. Examples of such crisis narratives include Mehta’s (2001) ‘water scarcity’ narrative as a justification for large dam development in Gujarat. These narratives are the ‘primary means whereby development experts and institutions for which they work claim rights to stewardship over land and resources they do not own.’ (Roe, 1995, p. 1066). As Fairhead & Leach (1997) argue, narratives also determine the data that can and cannot be considered in policy debates. In addition to such ‘crisis narratives’ there are what we would term ‘opportunity narratives’ in which a scenario of opportunity, for example for hydropower development, is similarly presented to justify specific types of policy intervention, by specific actors with their particular agendas.

Development narratives recognise that the world is complex, but also seek to simplify this complexity. They describe the world and set out a course of action to affect change in such a way that they harness support for specific actors, institutions and actions. The purpose of policy, whether at the stage of proposals, plans or implementation, is to identify and frame a complex problem to be resolved by a simple solution. In simplifying the complex, policy arguments become the more compelling the more they are able to appear as inevitable, as if no other strategy could be feasible or conceivable. Keywords (cf Williams, 1976), catch-phrases and terms assist in the simplification of complexity. The language of development is dominated by key words: poverty reduction, participation, empowerment, community, sustainability. Each of these words has diverse meanings and is interpreted in a range of competing types of policy interventions. Differences in interpretation are founded on competing values of development (cf Ratner, 2004).

3. Hydropower and capture fisheries: from “a dam or nothing” to “my friendly dam”

3.1. Focus on untapped hydropower potential and aquaculture as a substitute to capture fisheries

A development narrative based around hydropower as the basis for economic development in the Mekong has a long history (Bakker, 1999; Sneddon & Fox, 2006; Molle et al., 2009). As well as supporting one of the most productive and biodiversity rich fisheries in the world, the Mekong Basin has been viewed as having huge potential for infrastructure-based water resources development, particularly hydropower with large-scale plans dating back to the 1950s (Molle et al., 2009). Current estimates suggest that only 10% of the basin’s hydropower potential is currently operational (WB/ADB 2006). The desire to meet this unrealized potential for regional hydropower development underpins the overall objective around which the current trade-offs narrative needs to be considered. There is now said to be both a ‘strong, pent-up demand’ for development in general, (WB/ADB, 2006, p. 17) and a specific need for hydropower development in order to generate economic growth and thereby address poverty (WB/ADB, 2006). Yet recent hydropower development is being driven by a new set of private sector actors and national governments, rather than the multilateral development banks as previously was the case (Molle et al., 2009).

There is an inevitable tension between hydropower development and the management of capture fisheries (Marmulla, 2001). Historically, there have been various shifts in the way this tension has been argued. For many years from the 1960s onwards, regional development was focused largely on hydropower, and fisheries were simply ignored. There was limited interest in capture fisheries
among governments and the Mekong Committee, as they were perceived to have limited potential for development. This was a position shared by many governments (see Masae & McGregor (1996) for a discussion of Thailand). Potential for aquatic resources was only recognised and promoted through the development of aquaculture, usually presented as the ‘blue revolution’ in an attempt to create an explicit comparison with the earlier ‘green revolution’ (Bush, 2003). In this context the promotion of hydropower was identified as an opportunity for the emerging aquaculture sector, stimulating demand for aquaculture as a result of dam impacts on capture fisheries, and providing reservoirs for stocking (Edwards & Demaine, 1997). Where the tensions between capture fisheries and hydropower development were addressed directly these were presented as a choice between fish and conservation on the one hand, and people and economic development on the other (see Chapman & Daming, 1996).

3.2. Appreciating the importance of capture fisheries and a shift to more precautionary approaches

In the mid-1990s there was a shift towards greater concern for the capture fisheries. Dams had generated intense controversy in Thailand with several projects abandoned in the face of public protests (Bakker, 1999), and the World Commission on Dams’ final report (released in 2000) provided a comprehensive review of the impacts of dams on fisheries and livelihoods, including a case study of the Pak Mun dam in Thailand (Amornsakchai et al., 2000). With international donor support, the Mekong River Commission itself began to play an important role by developing a fisheries project to assess the productivity of the basin, as the basis for assessing potential impacts and mitigation needs. Considerable information was generated about the capture fisheries of the Mekong within the MRC and among other agencies, with a resulting shift in the way that fisheries issues were discussed. The importance of capture fisheries in rural livelihoods and the implications of fisheries degradation for poverty began to be better documented and more widely acknowledged. The fundamental importance of hydrology, floodplain connectivity and habitat diversity to fisheries productivity has been extensively researched and documented (Baran et al., 2001; Coates et al., 2003; MRC, 2003; Baran, 2007). Infrastructure development became more readily identified as constituting the major threat to their sustainability. For example, in their environmental assessment of the Greater Mekong Sub-region, the ADB points to the development of dams and weirs, the Lancang cascade and mainstream dams in Mekong riparian countries, the Upper Mekong Navigation Improvements (China, Burma, Laos and Thailand), and pollution as the main threats to the fisheries (ADB, 2004: 96–98). In its 2003 State of the Basin report, the MRC said of the situation in the Lower Mekong:

*The ecology of the many fish species is intimately linked to the hydrology of the system. Fish are still abundant and the stocks are healthy due to a relatively unpolluted and intact environment with no dams on the mainstream outside China.* (MRC, 2003: 132)

With this recognition of the importance of capture fisheries to the Mekong Basin, there was a noticeable shift towards a more precautionary approach. During this period, the language of the MRC for

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2 The Mekong Committee was established in 1957, becoming the Mekong River Commission Secretariat with the signing of the 1995 Mekong Agreement.
example emphasized concepts of sustainable development and cooperation, and concerns for maintaining the natural productivity of the basin. The CEO of the time presented the ‘new vision of Mekong cooperation’, as:

*A vision that builds around the prevention of wasteful use of the basin’s waters, consistent with the need to protect, prevent and enhance the environmental and aquatic conditions and maintenance of the ecological balance of the Mekong River Basin.* *(Kristensen, 2001)*

### 3.3. Vigorous promotion of hydropower and managing trade-offs

Over the last four years, the discourse has shifted once again with the more vigorous promotion of hydropower. The current narrative presents a determined move away from an era in which it is argued that precautionary approaches and an ecological focus stifled development *(Blackmore *et al.*, 2004; *WB/ADB*, 2006). Yet the potential environmental impacts of hydropower development cannot be ignored entirely. As hydropower promotion once again comes to the fore, the concept of ‘trade-offs’ appears more widely. This has also generated a re-framing of the ‘problem’ of capture fisheries, and the means of dealing with infrastructure impacts.

The confidence that is now being placed in the technical capacity to model the hydrological changes as a result of planned water resources development, and then to assess and manage their impacts, making necessary trade-offs plays an important role in this renewed drive for hydropower *(MRC, 2008)*. Hydrological modeling of the Mekong has been attempted for many years *(Adamson, 2001; Sneddon & Fox, 2006; Sarkkula *et al.*, 2007)*. Within the last five years, a model-based approach around scenarios of development has been developed by the MRC and partners with financial support from the World Bank and other donors. The apparently low level of impact on the hydrograph in the scenario of large-scale development (e.g. *Adamson, 2001*) has come to be a justification for this very development, despite warnings from hydrologists that this needs further scientific investigation. The potential for hydropower as revealed by one particular scientific approach (hydrological modeling) has become a justification for this particular kind of development, with trade-offs the mechanism for dealing with impacts.

This hydrological model lies at the heart of much of the debate around current hydropower initiatives. The following passage provides a succinct summary of the approach:

*The bottom line message of this Mekong Water Resources Assistance Strategy is that the analytical work on development scenarios has for the first time provided evidence that there remains considerable potential for the development of Mekong water resources... The Mekong Basin has flexibility and tolerance, which suggests that sustainable, integrated management and development can lead to wide-spread benefits. This may contrast with the more precautionary approach of the last decade that tended to avoid any risk associated with development, at the expense of stifling investments. The study highlights that development and the ensuing changes in water use may have negative but also important positive impacts. Therefore, the study encourages decision-makers to*  

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3 This study refers to a process of hydrological modeling undertaken by the MRC with support from the World Bank. The modeling is based around 3 scenarios of infrastructure development, and assessing the impacts of such development on the hydrograph of the mainstream Mekong river.
found their policies on the economic, environmental and social dimensions of the trade-offs that emerge when water use is changed. (WB/ADB, 2006: 4; our emphasis).\footnote{This quotation also appears in the Mekong Water Resources Partnership (MWARP), dated February 2007.}

This position was also adopted by the MRC’s former CEO. In his opening address to an international hydropower meeting, Mr Olivier Cogels, sought to justify his organisation’s participation at such an event, explaining the MRC’s commitment to ‘rapid hydropower development’:

*Using a range of sophisticated mathematical models, in cooperation with the World Bank we are working with a range of integrated development scenarios based on high, medium and low levels of hydropower and irrigation development. This allows us to analyse benefits and cumulative impacts of these developments to enable member countries to work out the trade-offs which are acceptable for all concerned.’* (Cogels, 2006; our emphasis)

By framing water resource development in terms of trade-offs this new discourse recognizes that there are a range of costs and benefits, and that these have social, environmental and economic dimensions. Additionally, there is a recognition of the need for assessment of impacts in order to be able to make informed decisions, and that these decisions require negotiation between different stakeholders. The term trade-offs connotes a specific technical approach. Trade-off analysis has become a technical method that has been applied in various contexts in a range of disciplines, for example to assess development and conservation choices in marine protected area management (Brown et al., 2001), and as a technical tool applied in many situations, for example in the management of agricultural production and wetland preservation. These methods involve a range of supporting tools—multi-criteria analysis, participatory rural appraisal, and stakeholder analysis—to identify management options based on a range of management objectives, according to a range of criteria and a diversity of stakeholder interests.

The framing of water resource development in terms of trade-offs, however, is also problematic. Recourse to a scientific model contributes to reducing political choices about development to technical choices, and to technical exercises to be undertaken by technical experts (see Brock et al., 2001). The emphasis on hydrology and mathematical modeling influences what scientific disciplines and what data is credible (Fairhead & Leach, 1997), and who should be privileged to ‘analyse benefits and cumulative impacts’. Sarkkula et al. (2007) point to the critical need for a more active engagement with and integration of social scientists in multi-disciplinary teams involved in modelling at all stages of model planning and assessment.

With the hydrological model taking centre stage, predicted changes to the mainstream hydrology are argued to present opportunities for development, and that such opportunities are economically and socially desirable (WB/ADB, 2006). Despite the calls for the need to assess environmental and social impacts of hydrological changes, and the warnings from hydrologists that the implications of predicted hydrological change require further scientific study (e.g. Adamson, 2001) the interpretation of impacts has already become more widespread. From 2006 earlier concerns over impacts of hydropower were downplayed. For example, the CEO of the MRC of that time argued that the ‘... overall downstream impact of hydropower dams on the Lancang in China is often exaggerated in the public opinion.’
Yet this interpretation, while apparently justified according to the science of hydrological modeling, has occurred with no new assessment of impacts that would draw on other disciplinary approaches.

### 3.4. Including other threats to capture fisheries

In addition to downplaying the threats to capture fisheries from hydropower, new explanations for the vulnerability of capture fisheries are presented. In this emerging narrative, threats to the capture fisheries from hydropower are acknowledged but are counterbalanced by arguments that the main threats are derived from sectors other than hydropower and from within the fisheries sector. As well as the threats that derive from land use change and road construction, there is argued to be something inherent in the very nature of fisheries as common property resources that undermines their manageability and sustainability. For example: ‘it can be argued that the best basis for intervening in these ‘common property’ problems is provided by the existence of alternative sources of income (as provided by irrigated agriculture) and development generally (as facilitated by the availability of power)’. (WB/ADB, 2006: 64).

The problem with fisheries as framed in this way lies in their nature as common property resources, with an inference that they are subject to an old established crisis narrative of the ‘tragedy of the commons’. The future of fisheries is presented as already gloomy, while the potential for development lies outside of the fishing sector (Friend et al., 2009). In this way, the argument comes almost full circle to a position more familiar in the 1960s.

### 4. Unraveling the trade-off narrative’s assumptions

At one level, this emerging narrative and discourse of trade-offs in the Mekong appears perfectly reasonable, and that is a large part of its strength. The need for compromise and balanced development is often stated, and indeed the notion of balance is compelling. However this also becomes problematic. In this section we draw on the evidence from the Mekong to revisit the assumptions on which the trade-offs narrative is based—particularly those concerning the role of capture fisheries and rural livelihoods, the scale of impact that might arise, and the history of impact assessment and mitigation.

#### 4.1. Capture fisheries and poverty

Recent interest in poverty and livelihoods has helped to illustrate the importance of capture fisheries for local livelihoods, and to open debates on the relationship between poverty and fisheries (see Bene, 2003). It is therefore important to consider the relationship between capture fisheries, rural livelihoods and poverty in the Mekong.

A growing body of evidence illustrates the importance of capture fisheries to local livelihoods (Bush, 2003; Meusch et al., 2003). Fisheries constitute an important element of diverse livelihood strategies, contributing between 27 and 78% of animal protein in rural diets in the Mekong Basin (Hortle & Bush, 2003; Meusch et al., 2003; Baran et al., 2008). Aquatic resources are argued to be all the more important for poorer people, often presented as a safety net, or option of last resort. As common property resources,
they are argued to be accessible to landless or land-scarce households. For many poorer people, aquatic resources constitute the main coping strategy for periods of rice shortage and other crises (Friend & Funge-Smith, 2002; Meusch et al., 2003). In recognizing the importance of aquatic resources for poor people there is a concern that any degradation of these resources will have disproportional impacts on the poorest and most vulnerable sectors of rural society (Meusch et al., 2003). But capture fisheries are also argued to constitute an important component of livelihood strategies for the majority of rural people, including wealthier groups (Garaway, 2005).

Capture fisheries and the livelihoods they support have also come to represent alternative values of development. Aquatic resources are argued to support particular types of livelihoods forming the basis of rural people’s wealth, rather than their poverty (Shoemaker et al., 2001; Sretachaux & Deetes, 2004; Hall & Manorom, 2007). Aquatic resources and traditional capacity to manage these resources allow people to realize food security and economic self-sufficiency (Shoemaker et al., 2001: 68). Without a viable aquatic resources base, people would indeed become poor and would lose their capacity to manage their resource base in order to make choices about their own development. The cause of poverty derives from the development pathways that reduce the productivity of the natural aquatic resources base, and undermine the ability of rural people to manage these resources.

Within the current hydropower narrative there is an acknowledgement of the importance of capture fisheries for rural people, particularly the poor. It argues the need to avoid further degradation but also argues that rather than people engaging in fishing because they are poor, people are poor because they fish (see Bene (2003) for a discussion of similar arguments in other parts of the world). Fisheries alone are not able to address all development and poverty reduction needs. While degradation of these resources will have an impact on poor people, ultimately the only strategy to lift people out of poverty is to remove their dependence on aquatic resources, by providing alternative economic opportunities.

In reality, the relationship between poverty and fisheries across the estimated 60 million people of the basin encompasses elements of all three of the above interpretations. Although poverty reduction lies at the heart of the justification for hydropower development, there is only a superficial analysis of poverty and of options for addressing poverty. Poverty is said to lead to a ‘pent up demand for development’, and the strategy to deal with poverty (whether issues of life expectancy, health, food security or education) is through large-scale infrastructure development (WB/ADB, 2006). Different aspects of poverty are presented yet the problem of poverty is itself framed as a simple category requiring a simple solution. There is no discussion of the dynamics, diversity or causes of poverty (see Brock et al., 2001) and no scope for considering multiple strategies to address this complexity and diversity, or of the role that capture fisheries might play.

4.2. The scale and distribution of impact

The extent to which ‘trade-offs’ can be made, and costs and benefits determined, depends largely on the scale and distribution of those impacts. As we have seen, there is an assumption that the impacts on fisheries are less than has been previously expected, and that these are ‘often exaggerated’. However this is an assumption that has yet to be tested, and an assumption that is very much contested.

The region’s fisheries are some of the world’s richest in biodiversity (see Sverdrup-Jensen, 2002; Coates et al., 2003) with over 1,300 fish species identified in the Mekong Basin, and a range of
non-fish living aquatic resources such as aquatic insects, molluscs, crustaceans, reptiles and amphibians found in watercourses, rice fields, ditches and seasonal swamps, plus diverse edible aquatic plants. As far as fisheries are concerned, recent estimates suggest production figures of up to 2.5 million tonnes, worth US$ 3 000 million billion (MRC, 2003; Baran, 2007; Barlow et al., 2008). Baran et al. (2007) suggest that total capture fisheries production in the basin are equivalent to 17% of total global inland fisheries production. Even a small percentage decline in production would have considerable implications.

Assessing capture fisheries presents particular problems especially in quantitative terms. This is partly due to the imprecise nature of fisheries science and contemporary biological assessment models based on catch and effort. A review commissioned by FAO of official fisheries information concluded that most information provided by governments is unreliable and is most probably an underestimate of real production and value (Coates, 2002).

The impact of planned water resource development on the fisheries of the Mekong Basin inevitably remains uncertain. So far, there have been few attempts to assess this impact. However, the MRC is in the process of attempting these assessments, including a regional Integrated Basin Flows Management (IBFM) studies applying an Environmental Flows assessment approach to the mainstream of the Mekong River (MRC, 2005b) and a more recently planned Cumulative Impact Assessments and Strategic Environmental Assessment. Yet as we have seen, even before these assessments have been completed, positive interpretations of changes to the hydrology have become more widespread (cf MRC, 2008).

Using the same hydrological model and the same development scenarios as the MRC, a recent study commissioned by the ADB reached different conclusions and drew attention to the potential implications of hydrological changes to fisheries productivity (Baran et al., 2008). The main hydrological change is frequently presented as leading to an increase in dry season discharge. As the dry season is generally presented as a period of drought and water scarcity in the Mekong, increased dry season flows are usually presented as being beneficial (e.g. Chapman & Daming, 1996) (see Mehta (2001) for a discussion of a water scarcity narrative in Gujarat). Baran et al. 2008 provide a critical analysis of these assumptions for capture fisheries, focusing in particular on implications for fish migration patterns, and for changing dry season flows as a result of upstream dam development on the flooded forests of the Tonle Sap, a critical fish habitat and reservoir of biodiversity. Dry season flows act as migration triggers, largely for reproduction and particularly for some of the more economically important species. If dry season flows are indeed increased by infrastructure then dry season migration thresholds or cues might never be reached, which will inhibit the migration of species sensitive to these cues, and would also undermine the flooded forests that require both periods of inundation and recession. They conclude that changes in dry season flows mean that the ‘impact would be dramatic for fishers and food security’ (Baran et al., 2008).

The Mekong capture fisheries cover a huge geographical area and support a large number of people living in diverse social, cultural, political, economic and bio-physical settings. While it might be conceivable to identify impacts, assess ‘trade-offs’ and determine appropriate mitigation and compensation on a localized scale, it becomes all the more difficult for the cumulative impacts across the Mekong Basin as a whole. Assessing localized impacts of a specific dam project might be more realistic, yet the migratory nature of fisheries in the Mekong mainstream and tributaries means that there will inevitably be far-reaching implications of dam development.
4.3. Impact assessment processes in the Mekong

The argument that trade-offs can be made depends very much on the institutional, technical and legal capacity to undertake impact assessments. In addition to the challenges of assessing capture fisheries discussed above, many commentators argue that current impact assessment measures and processes remain weak in the Mekong Basin (Ratner, 2003; Molle *et al.*, 2009). National legislation for environmental impact has been criticised as being ineffective within the countries of the Mekong Basin, and trans-boundary assessments even weaker (Hirsch *et al.*, 2006). Consultation with stakeholders remains a challenge and particularly so when impacts are felt further downstream or across national boundaries. Without adequate impact assessment processes the various costs of water resource development cannot be identified, and stakeholders cannot be involved.

Experience from recent cases illustrates that impacts on fisheries, particularly at the basin scale, are rarely fully assessed. On the occasions that they have been addressed, this has only occurred in the latter stages of project design, and largely as a result of pressure from civil society.

The original Environmental Impact Assessment (EIA) for the Pak Mun dam in north-east Thailand downplayed the significance of fishing in local livelihoods, classifying locals as farmers. Additionally, the World Commission on Dams case study of the dam, exposed how the impacts on capture fisheries were originally argued to be negligible by the dam developers, and indeed the damming of the Mun river was argued to provide an opportunity for fisheries development, through stocking the reservoir (Amornsakchai *et al.*, 2000). The World Commission on Dams (WCD) case study of Pak Mun concluded that the dam’s reservoir produced just 10% of pre-project fish production estimates; fish migrations of many commercially important species declined or ceased altogether; fish biodiversity in the Mun system reduced from 265 species prior to construction to just 96 species found in surveys post-construction; approximately 50 rapids-dependent fish species disappeared altogether as numerous rapids were drowned or destroyed by blasting; and it was conservatively estimated that the lower Mun fisheries declined in economic value by about US$1.4 million per year. The impacts on the capture fisheries and local livelihoods were also documented by local people’s own research, known as Tai Baan research, when the government proposed an experimental period of dam opening for four months a year in response to campaigns against the dam (see Srettachau & Deetes, 2004). This research confirmed similar serious environmental, economic and cultural impacts, but also presented the conflict as being between different values of development and different knowledge systems.

The Pak Mun Hydropower project, although small compared to most dams in the region at just 17 m high and with an installed capacity of 136 MW, generated conflict over many years that still reverberates through Thai society today (Baker & Phongpaichit, 2005; Schuettler, 2005; Blake, 2006) The compensation costs were also huge and unprecedented in Southeast Asia. By March 2000, the Thai government had been obliged to pay US$19.5 million to local villagers as compensation for lost fisheries livelihood and it was found that the number of households dependent on fisheries in the upstream section had declined from 95.6% to 66.7% (Amornsakchai *et al.*, 2000). Yet despite this level of compensation, recent assessments conclude that incidences of poverty and out-migration have increased (Hall & Manorom, 2007).

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5 This figure compares with a total mitigation and compensation expenditure of US$44.24 million, making fisheries compensation easily the main livelihood sector recipient.
Even where EIAs have been reviewed and found wanting, there are few examples of action being taken. For example, the Upper Mekong Navigation Improvement Project was based on an agreement between China, Myanmar, Lao PDR and Thailand that sought to open navigation on the Mekong for large vessels by blasting reefs and rapids which obstructed dry season navigation. Responding to concerns from member states and partners, the MRC commissioned a review of the EIA, including a review specifically looking at fisheries issues. This review found the original EIA lacking in ‘credibility... (and) seriously deficient’ (McDowall, 2002: 9) and of such poor quality that it could not be the basis for sound decision-making.

Yet despite this evidence, the MRC took no further public position regarding the project. The main pressure came from civil society groups, and this opposition was most evident in Thailand where NGOs and local people campaigned vigorously against the project. The campaign included supporting grassroots groups in Northern Thailand to conduct their own research on fisheries and livelihoods (Tai Baan Research Network, 2004). Eventually the Thai Government called for a suspension of the project activities under pressure regarding the impacts on fisheries, ecology and livelihoods. But ultimately this decision was driven by concerns regarding the demarcation of the border between Thailand and Lao PDR, rather than by concerns for fisheries.

In both of these case-studies, fisheries were overlooked in the planning and impact assessment stages, and fishers excluded from negotiations about possible impacts and benefits. Even when the evidence of fisheries impacts was strong, and generated by an institution such as the MRC (as in the case of the Upper Mekong Navigation Improvement Project) and recognised by the ADB (see ADB, 2004) these concerns were largely ignored. Both cases, however, illustrate the role of civil society in exerting pressure on decision making and of the value of opening the decision-making arena to generate better decisions. It is also significant that, in both cases, fisheries concerns only came to public attention as a result of the interventions of NGOs and local people. These are the very stakeholders most excluded from assessment processes (Hirsch et al., 2006). Fisheries concerns have then become the basis for campaigns against the dam projects. This kind of response to dam development is increasingly in evidence and can only be expected to continue.

4.4. Replacing capture fisheries: fish passes, stocking and aquaculture

The history of mitigation of impacts from water resources development on capture fisheries has been extremely poor and haphazard in the Mekong region. Mitigation strategies have centred on modifying the design of dams and on promoting stocking of reservoirs and aquaculture to replace the losses in capture fishery.

Adapting the design of dams, for example through the inclusion of fish passes, has had limited success both in the developed and developing world (WCD, 2000; Roberts, 2001; Marmulla, 2001). While there have been problems with developing designs appropriate to local fishery migration patterns and species diversity, there is a more fundamental concern that ‘even the perfect fish ladder permitting all migrating fish to move upstream could not help when ecological conditions in the downstream and upstream environments are so unfavourable.’ (Roberts, 1993: 228). The limitations of fish passes and fish ladders have been acknowledged by the MRC Fisheries Programme, concluding that they would not be capable of handling the volume of fish migrations on the mainstream and lower parts of the large tributaries (MRC 2001), and reconfirmed in a recent public presentation (Dugan September, 2008).
Baran et al. (2008) argue that the scale of some fish migrations in the Mekong, of up to 30 tonnes per hour, could not possibly be managed through fish passes.

Reservoir stocking and aquaculture are usually presented as the other potential mitigation strategies for the impacts on capture fisheries. However, stock enhancement at newly created reservoirs has a rather checkered record of success (Roberts, 2001; Welcomme & Vidhayanon, 2003). As Dudgeon (2000) has pointed out, ‘fish yields can be enhanced by river impoundment, especially where low-order tributaries (not the river mainstream) are involved, but this increase usually depends on cage culture, stocking, or introduction of exotic species. It is invariably accompanied by a loss of native biodiversity’. Only nine of the known migratory fish species identified in the Mekong are known to breed in reservoirs (see Baran et al., 2008). The potential for establishing self-recruiting populations in reservoirs that could replace the capture fishery is therefore extremely limited.

Finally, there is an assumption that a trade-off can be made between the capture fishery and aquaculture. Yet the degree to which aquaculture can mitigate the impacts of water resources development remains uncertain. Current production estimates for overall fisheries production for the Mekong Basin suggest that capture fisheries constitute 80% of total production, while aquaculture and reservoir fisheries stand at 10% each (Sverdrup-Jensen, 2002). Or, considered another way, a small percentage increase in capture fisheries production would equal total aquaculture production. While most attention in increasing production is focused on aquaculture, the investment and effort required to achieve these increases in capture fisheries versus aquaculture have not been adequately assessed.

Despite the growth of the aquaculture sector in the Mekong Basin it remains subsidiary to capture fisheries. Small-scale, low input aquaculture, however, has provided important benefits for small farmers but largely by complementing rather than replacing the capture fishery (Friend & Funge-Smith, 2002). Concerns have also been raised that the benefits have tended not to reach poorer people (ibid). Ecological impacts of aquaculture have also been well documented, with a concern that much aquaculture remains dependent on the capture fishery for wild fry and feeds. These concerns have previously been recognized by the MRC Fisheries Programme, which concluded that while aquaculture will continue to make important contributions to overall fisheries production, it will not be able to compensate for losses in capture fisheries (MRC, 2001). In sum, while aquaculture can continue to contribute to capture fisheries it is unrealistic to expect that it will replace the productivity of the rich, diverse capture fishery and certainly not in a way that will address equity and sustainability concerns.

5. Stepping beyond trade-offs

While considering dam development in terms of trade-offs has an immediate appeal, it is not the only way of reconciling competing interests and values in dam development.

The emphasis on trade-offs is itself a deliberate move away from ‘precautionary approaches’ (WB/ADB, 2006) and constitutes a significant contrast to other strategic approaches to address large-scale infrastructure. For example the WCD presents what is termed a ‘rights and risks’ approach (WCD, 2000; Bird, 2002). This argues that the rights of those most at risk to the negative impacts of dam development should take precedence in planning and decision-making processes. The WCD further argues that the planning process itself should be based around a strategic framework in which assessing options is the first step that is undertaken in a consultative process that requires ‘gaining public acceptance’. This options assessment includes the option of no-dam development. The WCD strategic
framework addresses both the assessment of options and planning stages, as well as impact assessment, dam operation and mitigation dimensions. As such, the WCD strategic framework is as much concerned with the process of framing the objectives of river basin management as about dealing with the implications of specific water resource management decisions. Whereas current debates focus on technical modeling and assessment, the rights and risks approach also includes the political processes of identifying development objectives and making appropriate decisions.

The discourse of trade-offs is contributing to re-framing the scope of debates about capture fisheries and hydropower, and to the scope of current research. The fisheries sector has long bemoaned its lack of influence on development processes. Over the last decade, there has been a huge growth in research on capture fisheries in the Mekong so that the levels of production, hydro-ecological drivers of natural productivity and economic values are better documented than ever (e.g. Baran et al., 2001; Poulsen et al., 2002; Coates et al., 2003; Horte & Bush, 2003; MRC, 2003; Van Zalinge et al., 2004; Baran et al., 2007; Baran, 2007). This evidence is itself widely acknowledged even within some of the key institutions now involved in promoting hydropower and has certainly influenced development debates. Fisheries issues can no longer be ignored. But where they stand in opposition to development interests they can be downplayed, and the debate reshaped. Even when potential impacts are acknowledged (see Barlow et al., 2008) the debate can easily continue along the lines of negotiating trade-offs. Yet, framing the debate in terms of trade-offs allows for fisheries concerns to be focused on the impacts of development and how these can be managed rather than addressing fundamental issues about the direction of regional water resource development.

Without evidence and an argument that can demonstrate and articulate the potential contribution that capture fisheries can make to meeting the development challenges of the Mekong, capture fisheries remains lost in a crisis narrative (Friend et al., 2009). The challenge for capture fisheries is to present a pro-development narrative. There are already trends in this direction. Capture fisheries are beginning to play an important role in a development counter narrative that questions the values and direction of regional development, emphasising local community knowledge and capacity, and ecological and cultural values (Shoemaker et al., 2001; Missingham, 2003; Srettachau & Deetes, 2004; Baird & Mean, 2005). This counter narrative questions the fundamental values of regional development and the clash of rationalities that underpins development interfaces (see Long & Long, 1992). But as with all narratives, it is in danger of oversimplifying, and over-romanticising local community culture, and failing to adequately address such development needs as food security, health and improved incomes. As such, this remains a narrative that also has limited political influence and perhaps limited resonance with rural peoples in the Mekong. While this partly responds to Roe 1995 call for challenging development narratives via counter narratives, there is a need to provide a compelling alternative to current development agendas, and thereby broaden the scope for research and debate around regional development.

6. Conclusion and implications

Use of the term ‘trade-offs’ is a recognition that there are costs to be borne as a result of water resource development. Such an acknowledgement is to be welcomed. However, there are a number of limitations in basing discussions of water resource development and management of impacts in terms of ‘trade-offs’. First of all, trade-offs are currently most closely associated with an agenda that is actively
promoting large-scale water resource development. Despite connotations of balance, trade-offs are central to the rhetoric of an established agenda with a particular set of values and interests.

Secondly, this approach is based on an assumption that impacts can be identified adequately, that these will be less than had previously been expected, and that these can be managed. This is an assumption that has yet to be tested, and very much a reinterpretation of earlier analyses, even of analyses that have arisen from within the same agencies now promoting hydropower and water resource development. Despite the assertions that potential impacts on fisheries have been exaggerated, the more assessment that is undertaken the more it appears that the impacts could be even greater than previously feared (see Barlow et al., 2008). If so, the scale of impact would not allow for simple trade-offs. Additionally, the history of mitigation of infrastructure impacts on capture fisheries in the Mekong is very poor. The potential impact in the Mekong is on such a scale that the potential for mitigation needs to be carefully scrutinized.

More fundamentally, focusing on trade-offs of an established agenda deflects attention from the framing of that agenda, and limits scope for shaping alternative visions of development. There is a far greater need for serious analysis and debate of development challenges and options for meeting such challenges. The current analysis of development challenges, particularly of poverty and strategies to overcome poverty, is limited and unconvincing. Ultimately this constrains the scope for shaping policy options and strategies.

The inherently political dimension of negotiating competing visions of economic development is at risk of being reduced to a managerial and technocratic process. There is less discussion of who should be involved in considering these trade-offs and how this process should occur. Development is fundamentally about values of what should be. Current impact assessment procedures are inadequate to deal with these challenges. The discourse of ‘trade-offs’ should not deflect from the fundamental governance challenges in the Mekong about shaping the visions of development, and who has the power to make decisions, and how those decisions are made. While technical approaches such as hydrological modeling and trade-offs analysis are useful tools they cannot replace a political process of dialogue and negotiation for decision-making. In order to ensure a thorough consultative process, particularly with those most at risk, it is important that these assessments also allow for public scrutiny and peer review. So far, such a process has not happened. With such a controversial history of dam development in the Mekong, and the possibility of widespread impacts on the most productive natural resource of the Basin, there is a need for a more comprehensive and strategic approach to planning, assessment and negotiation of future development that is founded on precautionary principles and concerns for rights and risks. While implicitly recognizing that there will be impacts, framing debates in terms of ‘trade-offs’ is increasingly becoming a substitute for such a comprehensive approach.

References


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