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# Managing international river basins: successes and failures of the Mekong River Commission

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## 34.1 Significance of the Mekong River

The Mekong River is, by many criteria, the most important river in South-east Asia. It is large, it is politically significant, it has great conservation importance, and it supports a large and rapidly growing human population. In addition the river is coming under increasing pressure from development, leading many authors to identify it as a river 'at the crossroads' (Kummu *et al*., 2008), 'at risk' (Osborne, 2004), or 'under threat' (Osborne, 2009).

The Mekong is the largest river in South-east Asia, and, by many measures, in the world's top dozen. It has a mean annual discharge estimated at $475 \times 10^9$ m$^3$ (Adamson *et al*., 2009), making it about the tenth largest river by discharge, and has a catchment area of 795 000 km$^2$ supporting about 70 million people (Campbell, 2009a). The river is in many respects a fairly typical tropical flood-pulse river, but is unusually regular in the timing and size of the annual flood. At Pakse in southern Laos, the peak of the flood most commonly arrives on 1 September, with a standard deviation of 23 days (Campbell, 2009b). At Pakse from 1993–2002, the size of the mean annual peak flow was 24 times the mean annual minimum flow, the index of variation of the peak flow was 0.08, and the coefficient of variation of the annual flow was 0.18, which is very small for a river of its size (McMahon *et al*., 1992). All this means that the river is very predictable, that large floods are not much larger than the small flood and the flood is of very similar size from year to year, and that floods occur at about the same time every year.

The floodplain and delta area of the river is very extensive (Carling, 2009). It incorporates a substantial proportion of southern Cambodia, including the Tonle Sap Great Lake which supports important biodiversity values as well as a very large fishery (Campbell *et al*., 2006; Campbell *et al*., 2009b). The Mekong delta is one of the world's mega-deltas, and is the major food production area for Viet Nam.

The Mekong River rises in the Himalayas in Tibet, and flows through China, forming a border between Burma and Lao PDR, and Lao PDR and Thailand, before continuing through Cambodia and Viet Nam to the South China Sea (Figure 34.1). It has long had political significance as a route by which armies travelled in the Khmer period, and an

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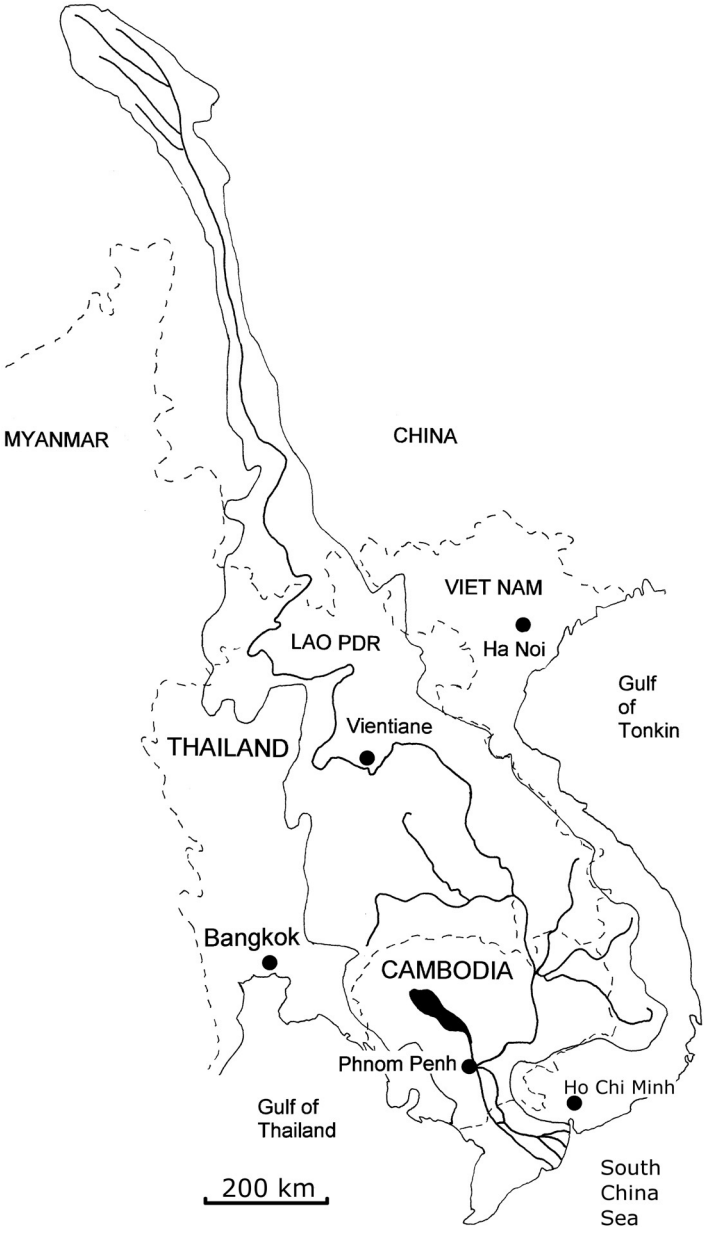


Figure 34.1. Map indicating the locations of the six Mekong riparian countries. The river forms the part of the border between Lao PDR and Thailand, and also Laor PDR and Myanmar (Burma).

exploration route during the European Colonial period. It has served as a border between French Indochina and Thailand, and later as a border for modern countries, although the exact location of the border has never been agreed between Lao PDR and Thailand, giving rise to occasional disputes over islands. In the 1800s the French hoped that the river could

serve as an alternative trade route to China (Osborne, 1996). The same hope seems to form the driving force behind the present Mekong Navigation project, which aims in the long term to allow navigation from Yunnan to the South China Sea (Campbell, 2009c).

Whether or not the Upper Mekong Navigation project is ever completed, the Mekong is a politically significant trade route. In the lower Mekong, ocean-going ships transport cargoes from the sea to Phnom Penh, while smaller boats carry goods and passengers from Phnom Penh to Kratie and Stung Treng. In the Upper Mekong, there is a substantial and growing boat traffic linking northern Thailand, Laos and China.

The Mekong is a river with great conservation significance. It is perhaps most notable for the great diversity of fish species (Valbo-Jorgensen *et al*., 2009), with about 850 described species known from the river (Hortle, 2009a) and many more to be described. Among the described species are several flagship giant fish species including the giant Mekong catfish (*Pangasianodon gigas*), Siamese giant carp (*Catlocarpio siamensis*), and Jullien's golden carp (*Probarbus jullieni*), all of which are now rare (Mattson *et al*., 2002). Apart from the fish, the Mekong is notable for a small (and regrettably declining) population of river dolphins, now thought to number only about 130 individuals (Beasley *et al*., 2009), and an extraordinary diversity of freshwater molluscs (Attwood, 2009).

The lower Mekong countries rely on the Mekong for the greater part of their livelihoods. They are cultures supported by rice and fish – and both are linked to the river. A substantial proportion of the rice crops in the Lower Mekong is either supported by irrigation from the river or its tributaries, or arises from recession rice grown as annual floodwaters recede. Most rural families have one or more members involved in fishing, either directly as fishers, or indirectly through trading in fisheries products. In many cases fishing is not a full-time activity, but is nonetheless important to the livelihood of the family. Hortle (2009b) estimated that more than 80% of rural households in the Mekong Basin in Thailand, Laos, and Cambodia were involved in capture fisheries, and up to 95% of the rural households in the Viet Nam delta.

## 34.2 The development of a Mekong River basin organisation

The Mekong was one of the first international rivers for which there was recognition of the need to manage the river equitably and as a whole system. The first Mekong River basin organisation, the 'Committee for Coordination of Investigations of the Lower Mekong Basin', usually referred to as the Mekong Committee, was established in 1957 under the auspices of the UN Economic Commission for Asia and the Far East (ECAFE). The Mekong Committee was a development organisation consisting of representatives of the 4 lower Mekong riparian countries which coordinated a series of investigations to assess the potential of the basin for hydropower, irrigation, and flood control projects (Mekong Secretariat, 1989).

In 1970 the Mekong Committee produced the '1970 Indicative Plan' for the basin, which identified 180 possible projects to promote basin-wide development, including a cascade of 7 mainstream dams (Campbell, 2009a). However, the political situation in the region,

and the reluctance of potential donor countries to support large infrastructure projects, meant that none of the mainstream projects were built, which remains the case today for the Mekong below China.

With the political turmoil following the American war in South-east Asia, Cambodia, Laos, and Viet Nam failed to appoint representatives to the Committee in 1976 and 1977 and no meetings were held. Thailand, Viet Nam, and Laos agreed in April 1977 to establish an 'interim' committee in the absence of Cambodia which was under the Khmer Rouge regime. The Interim Committee was officially formed on 5 January 1978, and continued operating until 1994. In 1991, the Cambodians, with a new government, indicated their interest in rejoining. The member countries decided that, rather than simply revive the previous committee, they would establish a new organisation, the Mekong River Commission (MRC), and in April 1995 they signed the 'Agreement on the cooperation for the sustainable development of the Mekong River Basin', generally referred to as the 1995 Agreement.

In structure, the MRC consists of a Council of Ministers, a Joint Committee, and a Secretariat. In addition, each member country has established a National Mekong Committee to coordinate interactions with the Secretariat, although this is not required under the Agreement. The Council of Ministers meets annually and is charged with making policies and decisions to implement the agreement and resolving differences and disputes between the member countries. The Joint Committee is a committee of heads of government departments from the member countries which meets at least twice each year to implement the decisions of the Council. The Secretariat is headed by the CEO, and provides technical and administrative services to the Council and Joint Committee. From 1998 until 2004, the Secretariat was based in Phnom Penh, Cambodia, after which time it relocated to Vientiane, Lao PDR. The intention was for the secretariat to alternate between those two localities on a five-year rotation, but after opposition from the donor countries, that position is being reconsidered, and at the time of writing it appears likely that the Secretariat will be split with a part being located in each of the two cities.

## 34.3 Defining the role of the MRC

The 1995 Agreement differed from the previous Mekong Committee founding statute in its greater emphasis on environment and sustainability rather than simply on development. The first three articles of the Agreement address areas of cooperation (Article 1), projects, programs, and planning (Article 2), and protection of the environment and the ecological balance (Article 3), so environmental protection and management were quite strongly emphasised, as was a role in development.

Many commentators feel that the Mekong River Commission has struggled to define a clear role for itself. The roles of environmental protector and developer are perceived as conflicting by most observers (Hirsch and Jensen, 2006; Campbell, 2009c). At various times the Commission has been accused of being too pro-development (Nation, 2007; Nette, 2008) and at others too green (Cogels, 2006); it has tended to vary its role, at times

emphasising the river basin management aspects and at others the development aspects, depending on the views of the CEO at the time (Campbell, 2009a).

The other polarity within the potential roles of the Mekong River Commission is between its role as a technical organisation and its political role. Environmental decision-making incorporates both technical decisions and value judgements (Campbell *et al*., 2005), and the MRC is involved in both. In the technical role the Commission conducts, or funds others to conduct, research to improve understanding of the basin and provide an empirical basis for planning and decision-making. Examples of the MRC fulfilling this role would include the publication of the State of the Basin Report (MRC, 2003) and the various technical report series. In its political role the MRC provides a forum for the member countries, and occasionally other participants – such as the dialogue partner countries (PR China and Myanmar) and donor countries – to negotiate political agreements on issues such as sharing of water and information and river management.

The two roles need not be in conflict, but need to be separated to some extent. It is important that the political discourse influences the technical questions that are addressed, so that the technical work conducted is useful for informing the political debate. However, it is important to ensure that technical work is not halted, or the results suppressed when they are politically inconvenient, as appears to have happened a number of times in the MRC (Campbell, 2009c; Hawkesworth and Sokhem, 2009).

The other issues around the interface between the technical and political roles of the MRC, and other river basin organisations, relate to how broadly technical information should be made available and the breadth of the political dialogue. This goes back to the previous issue of suppression of information, which may occur if technical information is retained within the Secretariat and not even provided to the Joint Committee. However, with any particular item of data or analysis there is always the issue to be resolved as to the responsibilities of the MRC Secretariat (MRCS) in releasing or distributing data and information. Is it enough to make material available just through the MRC library and webpage? If documents are produced, where should they be distributed? Should they be translated into the riparian languages? Translation of specialised technical documents is very difficult and time-consuming, often involving several rounds of work (because there are very few qualified translators who are also technically qualified, so there usually needs to be a translator plus several technical advisors).

Finally, to what extent should the debates and discussions at the Joint Committee and Council levels be open to, or allow the participation of, the broader community? At present there are a number of NGO groups, such as IUCN and WWF, who are invited to attend Joint Committee meetings. However, smaller local groups are not invited.

These issues cannot be decided by the MRC Secretariat. The role of the Secretariat is to support and implement the decisions taken by the Commission, which consists of representatives of the four member governments. It is the Commissioners who must decide policy issues. The Secretariat, working with the advice of the Joint Committee members, may only present options and advice to the Commissioners. The 4 member countries have very different views regarding public debate of contentious issues. While in Thailand there

is very open public discussion of water resource development and other environmental matters, in the other three countries there is, at best, a far more limited public debate. The ability of the MRC Secretariat to engage with, and respond to, NGOs and the general public should be gauged against this background.

## 34.4 Achievements and failures of the MRC: case studies

### *34.4.1 Navigation*

Navigation is one of the issues addressed in the 1995 Agreement. Article 9, Freedom of Navigation, asserts that as of right, 'freedom of navigation shall be accorded throughout the mainstream of the Mekong River'. This arose in part because the Mekong Committee had previously been active in promoting river navigation through the establishment of transit ports, construction of new vessels (especially car ferries), and the development and expansion of cargo handling facilities (Mekong Secretariat, 1989).

In the period following the signing of the 1995 Agreement, the MRC moved away from infrastructure projects and for a number of years the focus of the navigation program was on promoting the capacity in the member countries to manage navigation, addressing issues relating to the environmental impacts of navigation (including emergency responses), and attempting to remove institutional barriers to navigation.

A harmonised system of navigation aids developed jointly by the MRC and ESCAP was adopted by the lower Mekong countries in 2001 (MRC, 2003). However, although navigation began increasing rapidly between Thailand and China after the signing of the Lancang–Mekong Commercial Navigation Agreement in April 2000, navigation between Phnom Penh and the sea was declining while Cambodia and Viet Nam failed to agree on navigation protocols.

From late 2004, a new CEO at the MRC re-emphasised the role of the commission in infrastructure development. In 2007, the MRC executed a project to install 56 buoys and 12 leading markers in the Mekong between Phnom Penh and the border with Viet Nam. The intention was to facilitate 24-h navigation for large ships in the main stream and improve navigational safety over about 100 km of river.

However, there has still been no resolution of the stand-off over navigation protocols between Cambodia and Viet Nam. These remained an obstacle to increased navigation when the additional buoys were installed (MRC, 2007), and two years later there has still been no resolution. The lack of a resolution limits the value of the infrastructure works, and impedes growth of navigation between Phnom Penh and the sea.

### *34.4.2 Fisheries*

The fisheries program has arguably been the greatest success of the Mekong River Commission. The Mekong Secretariat in 1989 estimated annual fish consumption of the 46 million people living within the lower Mekong as 10–25 kg per head. That would require a harvest (including wild-caught fish and aquaculture) of between 0.5 and 1.2 million tonnes.

No estimate of the catch was possible beyond those figures. By 2009, the best estimate of the fish yield of the basin was 3.6 million tonnes per year (of which about 1.5 million tonnes derives from aquaculture and the rest from wild-caught fish; Hortle, 2009b), triple the previous figure. The difference may in part reflect an increase in catch due to an increased population of fishers and better equipment (especially monofilament nets), but a large part of the difference arises from better data collection and analyses, mainly attributable to the work of the MRC fisheries program.

The fisheries program has made substantial contributions to understanding fish ecology, and in documenting, and drawing attention to, the importance of the fishery. The ecology of the fish of the Mekong is better understood through the production of manuals of fish identification produced by the MRC (Vidthayanon, 2008), partly supported by the MRC (Rainboth, 1996), and a series of studies many of which have been published in the MRC Technical Paper series (http://www.mrcmekong.org/free_download/research.htm). Among other things, these have provided the first information on the extent of fish migrations in the Mekong (Poulsen *et al*., 2002), as well as data on fish catches (Hortle, 2009b), fishing techniques (Deap *et al*., 2003), and ecology (Poulsen *et al*., 2004).

The technical information produced by the fisheries program has attracted wide publicity within the basin. It has been circulated through technical publications as well as the fisheries newsletter 'Catch and Culture', which has been produced regularly since 1996 and remains the only program-based newsletter within the MRC. The fisheries program has devoted far more effort to communication within the basin than other MRC programs, including, for example, several short films that have been shown on television in all member-state countries. The fisheries program works directly with national fisheries departments, rather than through the national Mekong committees, so there is also a free flow of information to them and on to their stakeholders. This has changed the debate about the impact of development. Knowledge of the values of the fishery has meant that developments which have the potential to negatively impact the fishery now face much greater challenge to establish that they will produce a net economic benefit.

Although it has been extremely successful technically, and has impacted the debate on development within the MRC, the fisheries program has been far less successful politically. The importance of fisheries for food and income security, particularly for poor rural people, is effectively ignored in the development debate, and especially so in the debate about the construction of mainstream dams. The MRC itself has had little apparent influence on the debates within member country governments about the costs and benefits of proposed dams, either on the mainstream or elsewhere. Any influence the fisheries program has been able to exert has been through the use of its published technical information used by those producing (generally inadequate) environmental impact assessments.

### *34.4.3 The Hydropower Programme*

The MRC Hydropower Programme has operated somewhat intermittently, depending on donor support. Having produced an initial hydropower strategy in 2001, hydropower

activities at the MRC were largely dormant until 2006 when work began on a sustainable hydropower program, and the MRC contributed, jointly with WWF and the ADB, to a review of environmental indicators for hydropower.

In general, the MRC has been excluded from the hydropower debate. A notification system for projects on tributaries of the Mekong has been largely ineffective. Campbell (2009a) noted that the notification for the 280 MW (megawatt) Buon Kuop power station on the largely pristine Sre Pok River comprised only 4 paragraphs: 15 lines of text delivered to the MRC on 23 December 2003, announcing an expected start date of December 2003 (Dao Trong Tu, 2003). The notifications for Sesan 4 and Buon Tua Srah hydropower projects were similarly brief. The first was 7 pages, devoting 8 lines to the environmental impact, and the second was 4 pages, with 3½ lines on the environmental impact (Nguyen Hong Toan, 2004).

Essentially, the member countries develop their own hydropower plans and notify the MRC (as required by the 1995 Agreement) as cursorily as possible. The Agreement is technically observed, but the spirit of agreement has been lacking, at least in respect of hydropower development.

### *34.4.4 The Basin Development Plan*

The MRC and its predecessor have a history of developing basin plans. A series of indicative basin plans have been produced, for example in 1970 and 1987 (Campbell, 2009a). The earlier plans have been 'top down' – developed based on inputs from member governments with minimal input from other stakeholders – and have been widely criticised (e.g. see Kirmani and Le Moigne, 1997). Commencing in 2002, another attempt at a Basin Development Plan (BDP) was commenced, this time with more attention given to stakeholder participation. The planning process was based on a series of sub-basins within the lower Mekong Basin. Within each sub-basin, consultations were conducted with provincial governments and other key stakeholders to identify aspirations and planning issues.

In addition to this work at the sub-basin level, the BDP compiled a broad range of other information about the basin as a whole (and sub-basins where the information had sufficient resolution). This included information on agriculture and agricultural water use (Nesbitt, 2003), population distribution and economic status (Hook *et al.*, 2003), and environmental issues such as water quality, for which the data was analysed on a sub-basin basis (Campbell, 2007a).

The BDP also used tools developed under other MRC programs. Most notably the hydrological model developed for the Water Utilization Programme (WUP) was used to model a range of possible development scenarios. The scenarios were not plans or predictions about directions of development, but rather were intended to act as a basis for informed discussion among stakeholders (including national and provincial governments as well as other interest groups) about the types of outcomes that would be acceptable and the potential consequences of particular patterns of development.

As a technical planning process the BDP was successful. The products developed and released for discussion have been valuable and of high technical quality. However the

release of some of the material was blocked by staff in some of the national Mekong committees who were not comfortable with promoting or participating in stakeholder debates about the possible trajectories of development. Neither the scenarios nor an economic analysis of the costs and benefits of the scenarios were released by the MRC. Several of the scenarios were later released by the World Bank and others (Podger *et al*., 2004; Campbell, 2009b). Following complaints from some national Mekong committee members, BDP staff were instructed by the secretariat CEO, Olivier Cogels, not to use the term 'scenarios' nor refer to any scenarios. Several senior staff of the BDP subsequently resigned from the MRC, frustrated by what they perceived as obstruction of the planning process, particularly by the Thai NMC. The CEO then decided to replace the remaining BDP staff members and commence a new round of basin planning (BDP 2), still based on scenarios and using the term 'scenario', but with completely new staff.

### *34.4.5 The Water Utilization Programme*

The Water Utilization Programme (WUP) commenced in 2000 with World Bank funding under its GEF facility. The project incorporated three components: a basin modelling package; development of rules for water utilisation; and institutional strengthening of the MRC Secretariat and the national Mekong committees (World Bank, 2000). The total funding for the project was US$11 million, and the project was completed in 2007.

The basin modelling component was apparently conceived as a model of everything. It was to include surface water quantity and quality and groundwater, and to 'incorporate components to allow the direct assessment of transboundary impacts on ecological, social and economic resources and conditions' (World Bank, 2000). The project was intended to develop a permanent modelling capacity within the MRC Secretariat and the national Mekong committees so that the models could be applied and updated. This aim has not been achieved, and the groundwater, water quality, and other components were never developed, and in fact were never possible due to lack of data.

The primary outcome of the modelling component of the WUP was a suite of linked hydrological models: a catchment runoff simulation model, a basin flows simulation model, and a hydrodynamic model. The catchment runoff model is based on the SWAT software developed by the US Department of Agriculture, and is used to estimate flows to the other models. In most scenario modelling which has been released, this component of the model has not been used (Campbell, 2009b). The basin flows simulation uses the IQQM software. It routes sub-basin flows through the river system and allows for diversions, consumption, and dams and other control structures. This model was used for the river reach from the Chinese border to Kratie in Cambodia, where the river flows in a well-defined channel and floodplain inundation is minimal. Below Kratie, the package uses ISIS software to allow for modelling of tidal influences, the flow reversal of the Tonle Sap River, and salinity intrusions in the delta. The inputs to the ISIS model are the outputs from the IQQM model, so there is multiplication of errors as one moves downstream. The model has never been fully calibrated or validated. Following a review by an expert panel in August 2003 (MRC, 2004),

there was limited calibration of the models, and Podger and co-workers (Podger *et al*., 2004) conducted further checks based on mass balances.

Although the models cannot be reliably used to make accurate quantitative predictions about future flows in the river, they can be used for scenario testing. That is, given a particular flow in the river, what would be the consequences of various possible actions such as extractions of water for irrigation or the construction and operation of a dam? They were used to that end in the BDP process, but the results were not released by the MRC and therefore could not be used as a basis for discussion and negotiation within the MRC stakeholder community. They were subsequently used, and results released, by the World Bank (Podger *et al*., 2004; Campbell, 2009b).

Although the modelling component of the WUP can be viewed as having limited technical success (to the extent that a model has been developed and has been used, albeit not by the MRCS), the success of the rules development has been much more patchy. Attempts were made to reach agreement on several sets of rules: on data and information sharing, water use monitoring, notification, prior consultation and agreement, maintenance of flows on the mainstream, and water quality. The support for the development of rules was intended by the World Bank to support the implementation of Article 26 of the 1995 Agreement, which enjoined the Joint Committee to prepare and propose to Council rules for water utilisation and inter-basin diversions. The article went on to specify a number of items requiring agreement, including the time frame of wet and dry seasons, locations of hydrological stations, and criteria for determining surplus quantities of water during the dry season on the main stream.

When it came to negotiation, the Thai delegation to the Joint Committee argued that they could not agree to rules since this would impinge on their sovereignty, although 'rules' were specified in the agreement which they had signed. The Thais therefore insisted that they could only sign up to 'procedures'. Consequently all of the items identified in the agreement for which the countries are to negotiate 'rules' are now being identified as 'procedures'.

Agreement was first reached on data sharing and information exchange in 2001. However, the agreement is vague and is seen by some national agencies as an agreement only between national Mekong committees and not as an agreement which would bind water resources departments, for example. Consequently it has not lead to a noticeably freer exchange of data between member countries in the short term. Perhaps in the longer term the culture will change.

The Procedures for the Maintenance of Flows on the Mainstream, agreed in June 2006, contain nothing beyond what was already agreed in the 1995 Agreement (MRC, 2006). Likewise with the Procedures on water quality, which, three years after acceptance by the Joint Committee, have as yet not been endorsed by the MRC Council. The strategy employed to avoid serious issues appears to be including nothing within the procedures which is not already included within the 1995 Agreement, and then referring to technical guidelines which will be produced and will actually address the issue. However, in most cases no technical guidelines have been produced. This has allowed the MRC to appear

to fulfil the requirements of the donor funding the project, without the need to actually do anything concrete.

As noted, the attempt to establish procedures on water quality has stalled in the MRC Council. The early attempt focused on establishing agreement on standards for acceptable levels of microbial contamination using microbial indicators such as coliform bacteria. These were selected because there were no existing standards in several countries, so an agreed Mekong guideline could be developed that did not conflict with national standards. However, agreement could not be reached. Ongley (2009) has since published suggested Mekong standards for a number of chemical water quality indicators, which would make a good starting point for discussion.

The institutional strengthening component of the WUP is far more difficult to evaluate. There is little evidence that the secretariat of the national Mekong committees have any greater technical capacity. Many MRCS staff and NMC staff have been involved in the workshops discussing the development of the procedures, but to what extent there was a benefit is difficult to assess, the more so because of the relatively high rate of turnover in staff in both the NMCs and the MRCS.

### *34.4.6 Environment Programme*

The Environment Programme is one of the longest running MRC programs, which was charged, among other tasks, with managing the water quality monitoring activities which the MRC inherited from the Mekong Committee. The program has run a number of successful technical projects.

The Water Quality monitoring project has run since 1985 at about 100 sites throughout the basin. It has recently been revised to include a primary network of sites with basin-wide significance and a secondary network with sites of national significance (Ongley, 2009). The project involves sampling about 20 parameters at monthly intervals, with analysis being carried out by national laboratories. The data have been used several times for published assessments of basin water quality (Campbell *et al*., 2005; Campbell, 2007a) and as a basis for developing proposed water quality standards (Ongley, 2009). Regrettably, attempts by the MRC to use the data to produce a basin report card bogged down because some national Mekong committees would not agree to have any data published that may show river condition as being anything less than good. Like any large river with a populous catchment, there are parts of the Mekong that are stressed – particularly channels in the delta where population is most dense, and where the relatively high standard of living means that farmers can afford more fertilisers and pesticides than those upstream.

An assessment of river health based on biological indicators was commenced by the Environment Programme in 2002. It utilised a multi-national team drawn from all four MRC member countries working with two international mentors. The project ran successfully in that format until 2007, and produced a series of reports published by the MRC (e.g. Davidson *et al*., 2006) as well as several other publications (Campbell *et al*., 2009). In 2008, the format was altered and the single multi-national team was replaced with four

separate national teams because of pressure from national Mekong committees. As a consequence, the sampling methods now differ between countries, and are different from those used in the initial phase of the project, so data collected under the new regime may not be comparable with the previous data.

However, while the Environment Programme has had significant technical achievements it has also had some spectacular political failures. Of these, of most concern is the failure to establish a procedure for transboundary environmental impact assessment. While each of the Mekong countries has its own EIA legislation, there is no mechanism to either consider the potential impacts of a development on neighbouring countries, or to allow either citizens or government agencies of neighbours to have an input into the decision-making process. Europe has such an agreement, the Espoo Treaty (UN, 1994), and in the Mekong Basin there is a clear need for such an agreement. There have been a number of recent controversies arising from projects in one country severely impacting citizens in another. The Yali Falls dam is one well-publicised recent example (e.g. McKenney, 2001).

The MRC Environment Programme expended considerable effort in trying to establish a dialogue between national governments on transboundary EIA. A series of national workshops was held, together with a regional workshop, and a study tour to Europe looked at the functioning of the Espoo treaty and reviewed examples of the treaty in operation over transboundary projects between Germany and Poland and Germany and the Czech Republic. However, the activity effectively ceased due to objections by Thailand that such an arrangement would impinge on its sovereignty.

## 34.5 Technical achievements vs political failures

A common theme through all of the MRC programs and projects has been technical success but political failure. The examples cited are a small selection of many which exemplify the problem. Many others could be given. For example, the Appropriate Hydrological Network Initiation Project was supported with about $5 million by the Australian aid agency AusAID. The project purchased and installed equipment selected by the MRC to provide real-time (or near real-time) monitoring of river levels and discharges. Staff from member country agencies were then trained to operate and maintain the equipment. The agreement between MRC and AusAID stipulated that at the end of the project the MRC would continue to operate the network. Despite some difficulties arising because the MRC staff selected inappropriate equipment for installation (against the advice of the consultants running the project), the network was established and operating satisfactorily by the completion of the project. Data from some sites were potentially particularly valuable. For example, the data collected every few minutes from near the border between China and Laos demonstrated the erratic operating regime of hydropower dams upstream far better than the previous hydrological data which were collected much further downstream (at Chiang Saen) and recorded only daily water levels. In spite of the potential value of the data, and several MRC programs indicating their willingness to contribute to supporting the continued running of the project, the MRC simply walked away and refused to honour

the agreement. Astonishingly, AusAID then agreed to contribute a further $5 million to continue the project. So the MRC decision appears to have been politically astute!

What is of great concern is that, in many cases, the political failures appear to many observers to have been deliberate decisions by Commission member countries. Thailand, in particular, has been repeatedly identified as intentionally obstructing development of a political consensus. Certainly the Thais blocked the development of an agreement on Transboundary EIA, the first BDP, and the development of any sort of regulatory rules on water quality or water sharing. They also worked to bring about the demise of the environmental flows investigations. With one country working to block the genuine efforts of the others, no political resolution can be reached.

## 34.6 Conclusions

Management of large international river basins in developing countries is often hampered by both a lack of technical capacity as well as a lack of political consensus. In the case of the Mekong, there has been substantial technical achievement. Maintaining a high level of achievement is always a challenge, and it certainly has not always been maintained by the MRC and its predecessors. Recent reviews of the operations of the MRC have questioned whether the present administrative arrangements are conducive to maintaining the quality and volume of technical output (Campbell, 2009c; Hawkesworth and Sokhem, 2008).

Success in the politics and governance of international river basins is a far greater challenge. The Mekong River Basin is not yet in a generally degraded condition, although the trends are alarming (Campbell, 2007a; Osborne, 2009). In many of the large river basins where governance appears to be more strongly developed than in the Mekong, political agreement was only achieved after the river became so degraded that politicians and senior bureaucrats were forced to act. Examples include the Rhine and the Colorado, and a similar story for national rivers can be told for the Murray–Darling in Australia, the Thames in the UK, and the Mississippi in the USA, among others (Campbell, 2007b). It would be sad indeed, and catastrophic for the subsistence users, if the Mekong has to degrade to the extent that some rivers in Europe, North America, or Australia have degraded before the riparian countries are galvanised into taking the serious political steps necessary to manage their river.

The signing of the 1995 Agreement was a great achievement. It appeared to signal recognition by the lower Mekong countries that the river could only be managed, and conflict avoided, through cooperation. It was also a very far-sighted document in its recognition of the need to manage and maintain the ecological health of the river. But it has been argued that the environmental emphasis in the agreement was primarily a response to donor concerns (Hirsch and Jensen, 2006). The technical work conducted by, and through, the MRC Secretariat has greatly strengthened understanding of the river as a biophysical system, and provided a firm base for effective river management. However, effective river management requires effective political decisions, and for both the member countries and China to realise that their long-term interests are served neither by avoiding and postponing decisions,

or by taking decisions which benefit them in the short term but at the expense of their neighbours. The region will be best served by maintaining the health of the river so that all riparian countries, and their people, have an equitable share of the benefits and costs.

So far the Mekong River Commission has not provided a successful model of an effective river basin management organisation, because it has not been able to use the technical understanding to reach political agreement. In that respect it provides a useful model. The four riparian countries do not have an equal commitment to effective river management. Thailand, in particular, devotes most of its energy to ensuring that critical political decisions are not taken. Viet Nam is ambivalent, strongly supporting decision-making processes for the main stream, but careful to restrict discussion about management of tributaries on which they are building hydropower dams.

The lesson for other river basin organisations is clear. Obtaining accurate and appropriate technical information is necessary, but not sufficient, for effective river basin management. A strong political commitment is needed if the necessary policies and regulatory frameworks are to be developed and implemented.

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## References

Adamson, P., Rutherfurd, I. D., Peel, M. and Conlan, I. (2009). Hydrology. In *The Mekong. Biophysical Environment of a Transboundary River*, ed. I. C. Campbell. New York: Elsevier, pp. 53–765.

Attwood, S. W. (2009). Mekong schistosomiasis: where did it come from and where is it going? In *The Mekong. Biophysical Environment of a Transboundary River*, ed. I. C. Campbell . New York: Elsevier, pp. 275–99.

Beasley, I., Marsh, H., Jefferson, T. A. and Arnold, P. (2009). Conserving dolphins in the Mekong River: the complex challenge of competing interests. In *The Mekong. Biophysical Environment of a Transboundary River*, ed. I. C. Campbell. New York: Elsevier, pp. 365–91.

Campbell, I. C., Barlow, C. G. and Pham Gian Hien (2005). Managing the ecological health of the Mekong River: evaluating threats and formulating responses. *Verhandlungen des Internationalen Verein Limnologie*, **29**, 497–500.

Campbell, I. C. (2007a). Perceptions, data and river management: lessons from the Mekong River. *Water Resources Research*, **43**: W02407, doi: 10.1029/2006WR005130.

Campbell, I. C. (2007b). The management of large rivers: technical and political challenges. In *Large Rivers*, ed. A. Gupta . Chichester, UK: John Wiley, pp. 571–85.

Campbell, I. C. (2009a). Introduction. In *The Mekong. Biophysical Environment of a Transboundary River*, ed. I. C. Campbell. New York: Elsevier, pp. 1–11.

Campbell, I. C. (2009b). Development scenarios and Mekong River flows. In *The Mekong. Biophysical Environment of a Transboundary River*, ed. I. C. Campbell. New York: Elsevier, pp. 391–406.

Campbell, I. C. (2009c). The challenges for Mekong River management. In *The Mekong. Biophysical Environment of a Transboundary River*, ed. I. C. Campbell. New York: Elsevier, New York, pp. 405–23.

Campbell, I. C., Chessman, B. C. and Resh, V. H. (2009a). The development and application of biomonitoring in the Lower Mekong system. In *The Mekong. Biophysical Environment of a Transboundary River*, ed. I. C. Campbell. New York: Elsevier, pp. 323–37.

Campbell, I. C., Poole, C., Giesen, W. and Valbo-Jorgensen, J. (2006). Species diversity and ecology of the Tonle Sap Great Lake, Cambodia. *Aquatic Sciences*, **68**, 355–73.

Campbell, I. C., Say, S. and Beardall, J. (2009b). Tonle Sap Lake, the heart of the lower Mekong. In *The Mekong. Biophysical Environment of a Transboundary River*, ed. I. C. Campbell . New York: Elsevier, pp. 251–72.

Carling, P. A. (2009). Geomorphology and sedimentology of the Lower Mekong River. In *The Mekong. Biophysical Environment of a Transboundary River*, ed. I. C. Campbell . New York: Elsevier, pp. 77–111.

Cogels, O. (2006). Opening address to Asia 2006: the International Symposium on Water Resources and Renewable Energy Development in Asia. Available at www.mrcmekong.org/MRC_news/speeches/30-nov-06_open_htm, accessed 10 January 2006.

Davidson, S., Kunpradid, T., Peerapornisal, Y. *et al*. (2006). *Biomonitoring of the Lower Mekong and Selected Tributaries*. MRC Technical Paper No. 13. Mekong River Commission, Vientiane, 100 pp.

Deap, L., Degen, P. and van Zalinge, N. (2003). *Fishing Gears of the Cambodian Mekong*. Inland Fisheries Research and Development Institute of Cambodia, Phnom Penh, 269 pp.

Dao Trong Tu (2003). *Memorandum on Notification on the Buon Kuop Hydropower Project from Viet Nam*. 22 December 2003.

Hawkesworth, N. and Sokhem, P. (2009). *Assessment of Progress in Implementing Reforms After the Independent Organisational, Financial and Institutional Review of the MRCS and NMCs, November 2006*. Final Report to the Mekong River Commission, February 2008 (sic), 27 pp.

Hirsch, P. and Jensen, K. M. (2006). *National Interests and Transboundary Water Governance in the Mekong*. Australian Mekong Resource Centre, University of Sydney, Australia, 171 pp.

Hook, J., Nivak, S. and Johnston, R. (2003). *Social Atlas of the Lower Mekong Basin*. Mekong River Commission, Phnom Penh, 154 pp.

Hortle, K. G. (2009a). Fishes of the Mekong: how many species are there? *Catch and Culture*, **15** (2), 4–12.

Hortle, K. G. (2009b). Fisheries of the Mekong River Basin. In *The Mekong. Biophysical Environment of a Transboundary River*, ed. I. C. Campbell . New York: Elsevier, pp. 199–253.

Kirmani, S. S. and Le Moigne, G. J.-M. (1997). *Fostering Riparian Cooperation in International River Basins. The World Bank at Its Best in Development Diplomacy*. World Bank Technical Paper 335. World Bank, Washington D.C., 42 pp.

Kummu, M., Keskinen, M. and Varis, O. (eds) (2008). Mekong at the crossroads. *Ambio: A Journal of the Human Environment*, **37** (3), 145–231.

MRC (2003). *State of the Basin Report 2003*. Mekong River Commission, Phnom Penh, 300 pp.

MRC (2004). *Decision Support Framework. Water Utilization Project Component A: Final Report*. Volume 11: Technical Reference Report. DSF 620 SWAT and IQQM Models. Phnom Penh, 73 pp.

MRC (2006). *Procedures for the Maintenance of Flows on the Mainstream*. Available http://www.mrcmekong.org/download/agreement95/Procedures_Guidlines/Procedures-Maintenance-Flows.pdf. Accessed 7 November 2009.

MRC (2007). 'MRC launches new navigation aid system.' *Mekong News*, April–June 2007.

McKenney, B. (2001). *Economic Valuation of Livelihood Income Losses and Other Tangible Downstream Impacts from the Yali Falls Dam to the Se San River Basin in Ratanakiri Province, Cambodia*. Report to Oxfam America Southeast Asia Regional Office, Phnom Penh, 21 pp.

McMahon, T. A., Finlayson B. L., Haines, A. T. and Srikanthan, R. (1992). *Global Runoff. Continental Comparisons of Annual Flows and Peak Discharges*. Cremlingen, Germany: Catena Press, 166 pp.

Mattson, N. S., Kongpheng Buakhamvongsa, Naruepon Sukamasavin, Nguyen Tuan and Ouk Vibol (2002). *Cambodia Mekong Giant Fish Species: On Their Management and Biology.* MRC Technical Paper No. 3. Mekong River Commission, Phnom Penh, 29 pp.

Mekong Secretariat (1989). *The Mekong Committee. A Historical Account (1957–89)*. Mekong Secretariat, Bangkok, 84 pp.

Nation (2007). *Mekong Commission Blasted Over River Dams*. Available at http://www.nationmultimedia.com/2007/11/14/national/national_30055997.php. Accessed 14 November 2007.

Nesbitt, H. (2003). *Water Used for Agriculture in the Lower Mekong Basin*. MRC BDP Research Report. Mekong River Commission, Phnom Penh, 33 pp.

Nette, A. (2008). *Mekong Commission Fends Off Credibility Charges*. Available at http://ipsnews.net/news.asp?idnews=42321. Accessed 15 February 2009.

Nguyen Hong Toan (2004). Notification on the Se San 4 and Buon Tua Srah Hydropower Projects. Unpublished memo to Olivier Cogels, 12 pp.

Ongley, E. (2009). Water quality of the Lower Mekong River. In *The Mekong. Biophysical Environment of a Transboundary River*, ed. I. C. Campbell . New York: Elsevier, pp. 299–323.

Osborne, M. (1996). *River Road to China. The Search for the Source of the Mekong River 1866–73*. Singapore: Archepelago Press, 247 pp.

Osborne, M. (2004). *River at Risk. The Mekong and Water Politics of China and Southeast Asia.* Lowy Institute Paper 02. Lowy Institute for International Policy, Sydney, Australia, 56 pp.

Osborne, M. (2009). *The Mekong. River Under Threat*. Lowy Institute Paper 27. Lowy Institute for International Policy, Sydney, Australia, 77 pp.

Podger, G., Beecham, R., Blackmore, D., Perry, C. and Stein, R. (2004). *Modelled Observations of Development Scenarios in the Lower Mekong Basin*. Vientiane: World Bank, 122 pp.

Poulsen, A. F., Hortle, K. G., Valbo-Jorgensen, J. *et al*. (2004). *Distribution and Ecology of Some Important Riverine Fish Species of the Mekong River Basin*. MRC Technical Paper No. 10. Mekong River Commission, Phnom Penh, 116 pp.

Poulsen, A.F., Ouch Poeu, Sintavong Viravong, Ubolratana Suntornratana and Nguyen Than Tung (2002). *Fish Migrations of the Lower Mekong River Basin: Implications for Development, Planning and Environmental Management.* MRC Technical Paper No. 8. Mekong River Commission, Phnom Penh, 62 pp.

Rainboth, W. J. (1996). *Fishes of the Cambodian Mekong*. Mekong River Commission, FAO and DANIDA, Rome, xxvi + 265 pp.

UN (1994). *Convention on Environmental Impact Assessment in a Transboundary Context. Economic Commission for Europe.* United Nations, New York and Geneva, 49 pp.

Valbo-Jorgensen, J., Coates, D. and Hortle, K. (2009). Fish diversity in the Mekong River Basin. In *The Mekong. Biophysical Environment of a Transboundary River*, ed. I. C. Campbell . New York: Elsevier, pp. 161–98.

Vidthayanon, C. (2008). *Field Guide to the Fishes of the Mekong Delta*. Vientiane: Mekong River Commission, 288 pp.

World Bank (2000). *Project Appraisal Document on a Proposed Grant from the Global Environment Facility in the Amount of SDR 8 million (US$11 million equivalent) to the Mekong River Commission for a Water Utilization Project*. Report No. 19625-EAP. Rural Development and Natural Resources Sector Unit, East Asia and Pacific region, The World Bank, 72 pp.