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Enhancing capacities of riparian professionals to address and resolve transboundary issues in international river basins: experiences from the Lower Mekong River Basin

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Abstract

This paper analyses the design and impact of capacity building programmes aimed at enhancing capacities of riparian professionals to address and resolve transboundary issues in international river basins. Case study is a programme developed by the Mekong River Commission (MRC). A post training evaluation was applied to assess its impact in terms of individual capacity enhancement and change (use and application of knowledge, factors hampering application, and change in function and opportunities within their organisation). The design of the Capacity Building Programme of the MRC Flood Management and Mitigation Programme showed a well balanced range of subjects (such as IWRM, models and decision support systems and international water law) which are required for such an integrated topic. The post training evaluation, 6 months after the last training workshop, showed the increase in familiarity of the topics for all 37 respondents, with highest increase for the respondents with few years of working experience and from training and educational institutions. The relevance of the subjects taught is shown by the fact that 95 % of the respondents indicated they saw the relevance of the subjects and 78 % had already used some knowledge acquired in their job. The respondents also indicated that they did not have sufficient opportunities to apply all knowledge acquired. The phased implementation and training of lecturers during the training workshops, had a good impact, directly through increasing involvement in facilitation and delivery of the capacity building programme and through the use of the knowledge gained in short courses and development of curricula at their training institute. For these types of capacity building programmes, a few recommendations can be made. The selection of participants is crucial for the application of the learned knowledge in their work. The integrative nature of transboundary water issues calls for a capacity building programme addressing a wide range of subjects, which can be understood by a wide range of professionals from different sectors. Training modalities should also address this integrative nature such as roleplays and case studies. A successful capacity building programme needs to address the three levels of capacity

HESSD

9, 3813–3849, 2012

building (enabling environment, organisations, and individual staff) and involve national and regional training and education institutes.

1 Introduction

Adequate capacities of riparian countries to address transboundary issues in river basins is an important condition for successful river basin management (UNESCO-WWAP, 2006). An important element of this capacity is awareness and recognition of upstream-downstream interdependencies. Water users in river basin are linked through the water flow. These water links or water dependencies are frequently seen as a potential problem, especially when they are not institutionalised. This may lead to sub-optimal river management, as certain interventions in upstream tributaries with positive impacts downstream may not be economically feasible if considered in isolation. At the same time, environmental considerations are often not taken into account. As a result, differences may emerge between water users in different parts of a river basin. This is especially true in transboundary river basins, where water has created links between riparian countries. A solution to this potential problem is that the countries, sectors and water users involved are aware and recognise the upstream-downstream interdependencies that inevitably exist, and find ways of institutionalising them. Institutionalising interdependencies will strengthen the ties between riparian water users and such intensified social and economic cooperation may boost economic development regionally (Chheang, 2010). At the same time, transboundary agreements may divorce from the local situation and institute ecological degradation and provide increasing risk for human security (Fox and Sneddon, 2007). To balance these challenges, the "from potential conflict to cooperation potential" (PCCP) movement[1] was initiated (UNESCO,

[1]PCCP is one of UNESCO's International Hydrological Programme (IHP) contributions to the United Nations' World Water Assessment Programme (WWAP). http://www.unesco.org/new/en/natural-sciences/environment/water/ihp/ihp-programmes/pccp/.

HESSD
9, 3813–3849, 2012

2003). Its success hinges on societies and citizens being well-informed and water-wise. Hence, the importance of capacity building as a touchstone for transboundary water management.

The Mekong River Basin is one of the longest rivers worldwide. The river is formed by parts of China's Yunnan Province, Myanmar, Lao PDR, Thailand, Cambodia and Vietnam. The population in the Lower Mekong Basin (Cambodia, Lao PDR, Thailand and Vietnam) is around 60 million, is relatively young (around 25 % between 0 and 14 yr) and is largely living in rural areas (75 %) (MRC, 2010). The Mekong River and its resources provide essential benefits for the Mekong population, in particular those living in rural areas and the total direct-use value of e.g., fishery resources has been estimated about US$ 2 billion per year (Baran et al., 2007). The benefits are strongly related to the yearly recurrent flood phenomenon (Sneddon and Fox, 2006). The fluvial and floodplain habitats in the Mekong Plain form critical feeding and breeding habitats for over 700 fish species, of which part conduct seasonal migrations between the lower and upper regions of the Mekong Basin (Poulsen et al., 2002). But as normal floods bring many benefits, large floods can be very devastating and cause a lot of casualties and damage like the 2000 floods and the recent 2011 floods (MRC-FMMP, 2009, 2011). The average annual flood damage for the Lower Mekong basin is estimated to be US$ 60–70 million per year and is mainly concentrated in Vietnam and Cambodia (MRC-FMMP, 2009). Droughts in the basin unlike floods can occur at any time of the year and only have negative impacts. Due to climate change floods and droughts are expected to become more extreme in the future (MRC, 2010).

The Lower Mekong Basin countries are "medium human development" countries (human development index between 0.500 and 0.799) and show gradual improvement in development (MRC, 2010). Although, the basin still is one of the last great rivers without large reservoirs build in the middle and lower parts of the mainstream, this inevitably will result in more river basin developments impacting in various degrees on the river system and its functions. Preventing, addressing and resolving related transboundary issues, requires cooperation in the Mekong River Basin. The Mekong

HESSD
9, 3813–3849, 2012

Agreement 1995 between Cambodia, Lao PDR, Thailand and Vietnam, aims at providing an effective framework for such cooperation, and the transboundary dimension is at the core of the Mekong Agreement (MRC, 1995). The Mekong River Commission, established by the Mekong Agreement, aims to facilitate cooperation on the development and the management of the water and environmental resources of the lower Mekong River Basin (MRC, 1995). Although the Mekong Agreement 1995 is one of the world's first agreements which considers equitable utilization and considers the protection of water quality, it faces many challenges (Bearden, 2010).

Now 15 yr into the Mekong Agreement, the first major dam proposal on the mainstream (Xayaburi dam in Lao PDR) is under discussion by the four downstream countries (MRC, 2011). The Procedures for Notification and Prior Consultation and Agreement (PNPCA) under the Mekong Agreement is being applied to address and resolve the transboundary issue (MRC, 2003). Currently, the capacity in riparian countries is limited and showing regional variation to implement such procedures, adequately understand and analyse the implication of these developments and to come to a common agreement on such developments. Therefore, one of the components of the Flood Mitigation and Management Programme (FMMP) of the Mekong River Commission, aims at enhancing the cooperation between member countries through building skills and strengthening knowledge and capacities. To achieve this goal, the FMMP initiated a capacity building programme aimed at strengthening the capacity of both riparian high-level decision-makers and mid-level professionals on anticipating and resolving transboundary flood issues in the Lower Mekong River Basin (MRC-FMMP, 2008; Douven et al., 2009). The programme was implemented in two phases from 2009 until 2011. During these two phases 15 high-level decision-makers were trained and 76 mid-level professionals including 12 lecturers from national and regional training and education institutes.

In this paper, we analyse the design and impact of capacity building programmes in water and flood management in a transboundary context and try to learn some general lessons. This is done by studying the example of the MRC-FMMP Capacity

HESSD
9, 3813–3849, 2012

Building Programme in detail. We will present the design of the MRC-FMMP Capacity Building Programme and analyse its impacts in terms of individual capacity enhancement and change using a post training evaluation. Based on the insights gained we give recommendations for the design of similar programmes addressing cooperation in transboundary rivers. The paper is organised as follows. Section 2 presents the theoretical framework consisting of capacity building and its key elements and impacts of capacity building programmes. Section 3 gives information on the methodology that was used which relates to the design of the MRC-FMMP Capacity Building Programme and the post training evaluation. The post training evaluation results of the MRC-FMMP Capacity Building Programme are presented and discussed in Sect. 4. Finally, Sect. 5 contains the conclusions and recommendations for capacity building programmes in support of cooperation in transboundary rivers.

2 Enhancing human capacities to address transboundary water related issues

2.1 Capacity requirements for addressing transboundary water related issues

Key element in institutional arrangements in international river basins is the need to manage river basins as a whole and recognise the upstream-downstream interdependencies. To achieve this, far-going capacities are needed which are often lacking (UNESCO-WWAP, 2006). Capacity is a broad term and used in different contexts (UNDP, 1997; Kaplan, 2007; Baser and Morgan, 2008). These definitions illustrate some common elements. One common element is that capacity relates to abilities; abilities to perform functions (UNDP, 2007), abilities to manage successfully (OECD, 2006) or abilities to function strategically and autonomous (Kaplan, 2007). Another common element is that abilities are linked to conditions at different levels. These levels are an appropriate policy and legal framework (the enabling environment), effective, flexible and adaptive organizations (institutional or organisational capacity), and adequate individual capacities (human resources) (Alaerts and Kasperma, 2009). We will

HESSD
9, 3813–3849, 2012

address the level of individual capacity building specifically as it is the focus of this paper.

Individual capacities (for a certain function) can be expressed in professional competencies. Various authors have distinguished different categories of professional competence. Cheetham and Chivers (1996), for instance, distinguish between knowledge/cognitive competence (e.g., theoretical/technical knowledge, tacit knowledge, procedural knowledge of finances or projects), functional competence (e.g., occupation specific skills like report writing, IT literacy, budgeting, project management), personal or behavioural competence (e.g., self-confidence, control of emotions, listening, objectivity, collegiality, sensitivity to peers etc.), and values/ethical competence (e.g., adherence to laws, social/moral sensitivity, confidentiality etc.). Different functions will require different combination of competencies (Cheetham and Chivers, 1996; Uhlenbrook and de Jong, 2012). A floodplain modeller for instance will require a strong focus on technical knowledge/cognitive competencies. A water manager involved in addressing transboundary issues in river basins will require more integrative knowledge/cognitive competencies in combination with a strong focus on personal and value/ethical competences.

New water managers will need to be trained and educated addressing these mixed competence profiles. This is shown by Savenije and Hoekstra (2002) who describe the evolution of the field of Integrated Water Resources Management (IWRM). This field evolved from an engineering approach (water resources development) to water resources management (recognition that water can be "overexploited" and accounting for ecological and social constraints) to IWRM in which water management embedded in an overall policy for socio-economic development, physical planning and environmental protection. They argue that new water managers should be able to design and facilitate the process of IWRM: to identify water-related problems early on (and analyse causes), to carefully define the problem, understanding the interests of those involved and/or affected by it and its solution, to design the process towards solving the problem, and to facilitate that process and bring it to a satisfactory conclusion (van der

HESSD
9, 3813–3849, 2012

Zaag et al., 2003). Programmes educating these new water managers will need to address a mix of knowledge areas and skills which are related to technical aspects that enhance the understanding of physical, biological and other technical processes, non-technical aspects that enhance the understanding of legal, social, economic, financial, institutional and managerial aspects, and integrative aspects that enhance the understanding of the interplay between technical and non-technical aspect (e.g., WaterNet IWRM MSc Programme, see Jonker et al., 2012).

2.2 Impact of capacity building programmes

Olsen et al. (2006), for the example of ecosystem-based management, defined four orders of outcomes through successive project cycles. The first order sets the enabling conditions and encompassing commitment, authority agreement, funding, legal/institutional capacity to implement, clear policy and goals, and constituencies present at local and national levels. This order can be considered as part of "capacity". The second order is when changes in behaviour occur, which can be changes in behaviour of institutions and stakeholder groups, changes in behaviour directly affecting resources of concern, and/or changes in investment strategies. This order relates to "change". The third order – the attainment of IWRM objectives – is when the desired social and/or environmental qualities are maintained, restored or improved. Finally, the fourth order – sustainable basin and coastal zone development – is when the desirable and dynamic balance between social and environmental conditions is achieved. The latter two orders are related to different levels of "performance".

Baser and Morgan (2008) have analysed the inter-relation between capacity, change and performance in particular at the individual staff levels. They argue that the interrelations between capacity, change and performance are complex and need to be seen in relationship to the socio-political dynamics of the context within which they take place like external context, stakeholders, external interventions and internal features and resources. Also Mizrahi (2004) addresses the difficulties in measuring capacity enhancement and concludes – amongst others – that capacity enhancement involves more than

HESSD
9, 3813–3849, 2012

strengthening individual capacities. This is in line with Alaerts and Kaspersma (2009) who argue that the combination of different levels of capacity – institutional, organisational and individual staff – is a prerequisite for a successful programme. In this respect, also "adaptive capacity" is seen as a key capability at different levels to learn from past experiences and hence better cope with existing and future challenges (Pahl-Wostl et al., 2007). Mizrahi (2004) continues concluding that capacity enhancement should be regarded as a process, capacity enhancement indicators should be related to development objectives and specific actors towards which a project is directed and capacity enhancement projects must entail local ownership.

3 Methods: implementation and evaluation of the MRC-FMMP Capacity Building Programme

3.1 Design of the MRC-FMMP Capacity Building Programme

Processes of identifying, addressing and resolving transboundary water and water-related issues often have interdisciplinary dimensions, and are carried out by teams involving members with technical as well as administrative backgrounds working at different governmental agencies. A programme, like the MRC-FMMP Capacity Building Programme, which targets these professionals, will need to address physical, legal, technical, social, economic and political aspects in order to be able to educate professionals with specific backgrounds into team members who understand each other's background and can work in multi-disciplinary teams.

The design of the MRC-FMMP Capacity Building Programme has been based on the training needs of the four MRC member countries which were identified in several national consultation meetings (MRC-FMMP, 2008). Also, consultations were held with MRC programmes to ensure adequate integration with these programmes. Reports of the FMMP on transboundary flood issues (MRC-FMMP, 2007) and the legal aspects of the 1995 Mekong Agreement for enhancing cooperation in addressing these issues

HESSD
9, 3813–3849, 2012

(MRC, 2009) were consulted and helped in outlining the new capacity building programme within the scope of the subject.

The overall objective of the MRC-FMMP Capacity Building Programme is to enhance the capacity of riparian decision-makers and mid-level professionals in anticipating and resolving transboundary flood issues, differences and disputes in the Lower Mekong River Basin (MRC-FMMP, 2008). Compared to the levels of capacity building addressed in Sect. 2, the programme targets the third level – individual capacities – specifically. In the first phase also decision-makers participated, with the intention – on the longer term – to induce changes in the way organisations function and therefore the programme, indirectly, also targeted the second level of capacity – organisational capacity. In this paper, however, we will present the part of the programme developed for the mid-level professionals only.

The MRC-FMMP Capacity Building Programme developed in 2 phases (Phase 1 in 2009 and Phase 2 in 2010 and 2011) which allowed for a gradual development of the curriculum and related training materials based on regular evaluations. A key element in the design of the MRC-FMMP Capacity Building Programme was the involvement of national and regional training and education institutes[2]. The same group of lecturers from these training and education institutes participated in both phases to strengthen their knowledge and skills with the idea in mind that in later phases they could take over implementation of at least part of the MRC-FMMP Capacity Building Programme at the national level. A post training evaluation (after Phase 2) was carried out to assess the impact of the MRC-FMMP Capacity Building Programme in terms of the individual capacity enhancement of the mid-level professionals and how it changed their working situation. Related to Baser and Morgan's model (2008; Sect. 2) we address in this paper aspects of capacity and change, and not performance.

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HESSD
9, 3813–3849, 2012

3.2 Learning objectives and curriculum of the MRC-FMMP Capacity Building Programme

The specific learning objectives for the mid-level professionals participating in the MRC-FFMP Capacity Building Programme are strongly related to those identified for the new water manager (Sect. 2). Participants at the end of the programme were expected to be able (MRC-FMMP, 2008):

- To describe the key characteristics and challenges of the Mekong system, describe the key transboundary issues, and the rights, interests and responsibilities of those involved and/or affected by it and its solution.
- To contribute to/facilitate the process of addressing and resolving transboundary issues in line with options provided in the Mekong Agreement 1995.
- To list the role of tools (engineering, environmental, economic, conflict prevention and management) in supporting the process of addressing and resolving transboundary issues, and partly apply these tools.
- To critically review the process of addressing and resolving transboundary issues, the role of MRC institutions, the role of technical tools, and the conditions needed for implementation.

The MRC-FMMP Capacity Building Programme consisted of three training workshops and a role play aimed at building the right mix of knowledge and skills to address transboundary flood issues. The four main knowledge areas targeted were "Introduction Mekong" giving an introduction about the Mekong River system, its transboundary floods and concepts of IWRM and Integrated Flood Risk Management, "1995 Mekong Agreement" describing the main features of the agreement and its procedures in addressing and resolving transboundary issues, "Conflict management approaches" highlighting the type of approaches available including Alternative Dispute Resolution (ADR), and "Technical tools" addressing the importance of tools like GIS, models and

HESSD
9, 3813–3849, 2012

decision support systems in providing adequate information in the process of addressing and resolving transboundary issues. Table 1 presents the four knowledge areas targeted including the subjects taught in each of the training modalities. The table also highlights the type of teaching methods used in each of the modalities. The programme was designed over a nine months period in which the participants were expected to attend all training modalities. This design was based on the idea of incremental learning and to ensure that the knowledge gained would take root and would be sustained. It was also expected to instil self-confidence as well as respect and trust among the participants as they participated in the programme as a group. At the end of the programme, newly introduced in Phase 2, the participants participated in a so-called pilot study (MRC-FMMP, 2012). The pilot study is a role play of three days in which the participants – representing the different MRC institutions – were asked to address and resolve a given imaginary transboundary issue (e.g., a proposed hydropower development) following the basic principles of the Mekong Agreement 1995 and supported by a set of technical tools and conflict management tools (Fig. 2). This pilot study was introduced to allow the participants to apply and reflect upon the knowledge gained and skills acquired during the nine months programme period.

3.3 Measuring impacts: post-training evaluation

A post training survey was carried out to assess the training outcome and impact on the medium term. The aim was to assess what people had done with their (expected) enhanced capacities, beyond simply assessing whether they have retained the theory, which in general is a very limited part of capacity enhancement (Kirkpatrick and Kirkpatrick, 2006). We applied the capacity, change and performance model of Baser and Morgan's (2008) as a framework and identified indicators based on Mizrahi (2004). The selected indicators addressed capacity (working experience, familiarity with three knowledge areas – Mekong Agreement, Conflict management approaches, Technical tools – before and after programme) and change (usefulness knowledge, application of

HESSD
9, 3813–3849, 2012

knowledge, factors hampering application, and change in function in the organisation and opportunities in work) (Table 2).

The post training survey was carried out by means of an online questionnaire. By email all mid-level professionals participating in both programme phases were invited to fill-out the questionnaire. The questionnaire was online between September 15 and October 15 2011 which is two years after the ending of Phase 1 of the programme, and 5 months after the ending of Phase 2. Of the total 63 participants invited (of which we had email addresses) 37 participants responded (Table 3), resulting in a response rate of 58 %. The bench mark for response rates of Internet surveys is 30 % (University of Texas at Austin, 2007; Sheehan, 2001). The 37 respondents represent 43 % of the total 86 mid-level professionals that participated in both phases of the programme. The response data shows that most of the respondents worked for various government ministries and departments (25 out of the 37 respondents) like water resources, foreign affairs, natural resources and environment and fisheries, followed by training and education institutes (10), and the MRC (5)[3]. The survey population presents a good representation of the total group of participants.

4 Results of the post training evaluation

4.1 Working experience in related areas

A large part (65 %) of the 37 respondents worked for 5 yr and longer for their employer (Fig. 2). Their working experience in water and flood management, in transboundary water and flood management and with the MRC is shorter (between 27 % and 40 % of the respondents for 5 yr and longer), with least experience in transboundary issues of water and flood management (32 % of the respondents less than 1 yr, and no respondents more than 10 yr experience). The MRC-FMMP Capacity Building Programme,

[3]2 respondents indicated to work for both the MRC and a government department, one respondent worked for both a government department and training and education institute.

HESSD
9, 3813–3849, 2012

therefore, recruited participants with little or no experience in addressing and resolving transboundary issues.

Looking at the differences between the organisations, the data shows that most of the Mekong River Commission respondents had more than five years working experience in water and flood management, in contrast to the majority of the respondents from the training and education institutes who had little experience in this area. Most Mekong River Commission respondents had more than five years working experience with the Mekong River Commission, while only a few of the respondents from the training and education institutes had worked with the Mekong River Commission. The latter can be partly explained by the fact that relations between the training and education institutions and the Mekong River Commission, at least in the past, were limited. In addition, regional university curricula in water and environmental sciences only to a limited extent pay attention to transboundary aspects (MRC-FMMP, 2008).

4.2 Familiarity with the knowledge areas addressed

Respondents were asked to respond to statements related to their familiarity with three knowledge areas before and after the MRC-FMMP Capacity Building Programme. The knowledge areas assessed were Mekong Agreement 1995, conflict management approaches, and technical tools; all three in relation to addressing transboundary issues. The data shows that amongst the three knowledge areas, the familiarity before the MRC-FMMP Capacity Building Programme with conflict management approaches was lowest (33 % of the 37 respondents agreed and strongly agreed), and familiarity with the Mekong Agreement 1995 highest (54 % of respondents agreed and strongly agreed) (see Supplement). This confirms that conflict management and its approaches was a relatively new knowledge area for most respondents. Overall the respondents indicated that the MRC-FMMP Capacity Building Programme had led to a substantial increase in their familiarity with the three areas (on average an increase from 3.3 to 4.3; Table 4). Although the familiarity after the MRC-FMMP Capacity Building Programme

HESSD
9, 3813–3849, 2012

in both phases was comparable, the increase in familiarity was slightly higher in Phase 2 (increase of 1.3) compared to Phase 1 (increase between 0.4 and 1.0) (Table 4).

The familiarity with the three knowledge areas before the MRC-FMMP Capacity Building Programme was largest for the respondents from the Mekong River Commission, while the familiarity after the MRC-FMMP Capacity Building Programme was more or less equal when comparing respondents of the different organisations (Table 5). The different starting position of the respondents per organisation, is understandable given the mandate and activities of these organisations. The increase in familiarity was largest amongst respondents of training and education institutes, for instance the familiarity with the Mekong Agreement increased from 3.0 to 4.2, and with conflict management from 3.0 to 4.4. Respondents from the training and education institutes although having a different starting position appeared to have gained the most from the MRC-FMMP Capacity Building Programme.

Comparison of the responses about familiarity with the knowledge areas taught with the data on working experience clearly shows that the more working experience the respondents had the more familiar they were with the knowledge areas after the MRC-FMMP Capacity Building Programme (Table 6). The familiarity before the MRC Capacity Building Programme was clearly lower for the respondents with less than 1 yr experience, compared to respondents with more experience, but the increase in familiarity largest (ranging from 1.3 to 2).

4.3 Usefulness of knowledge addressed

Almost 95 % of the respondents (strongly) agreed that the knowledge gained during the MRC-FMMP Capacity Building Programme was useful for their professional work. The data shows that the longer the working experience of the respondents, the higher the agreement with the usefulness of the knowledge gained (Table 7). Reason for this result could be that more experienced respondents rank importance of the knowledge gained higher than les experienced respondents, also as they might see more possibilities for

HESSD
9, 3813–3849, 2012

applying the knowledge gained than less experienced respondents. The usefulness of the knowledge gained is also illustrated by some of the quotes of the respondents:

- "The knowledge gained is better for the cooperation with other countries."
- "IWRM principles are starting to be applied in Cambodia."
- "As I work in the Ministry of Foreign Affairs, I find the knowledge I have learned in the course very useful for me in my professional work, especially those concerning transboundary conflict management."
- "First, the experience from role play helped me to recognize the real situations. Second, I have recognized that tools are very important to help decision makers to make a good decision."
- "It helps me to be more confident in organizing the water related training programmes. It also built up my professional connections with other participants and resource persons."

The specific skills addressed in the MRC-FMMP Capacity Building Programme – critical thinking, cooperation, and building trust – were perceived as very important skills, while critical thinking scored a bit lower (79 % very important and extremely important, against 97 % and 94 % for cooperation and building trust). The respondents from the training and education institutes gave overall the highest scores, except for critical thinking.

4.4 Application of knowledge addressed

The knowledge areas addressed by the MRC-FMMP Capacity Building Programme were taught by various subjects as indicated in Table 2. In the post training evaluation respondents were asked about the use in practice of these specific subjects taught. The two subjects most used in practice were Mekong Agreement (67 % of the 37 respondents) and Integrated Water Resources Management (64 %). Respondents indicated

HESSD
9, 3813–3849, 2012

to use the knowledge gained by applying it in their work (78 %), by informing others (60 %), by using it in lecture and training material (22 %) and by giving a presentation (19 %). Differences in application between organisations are presented in (Table 8).

The two subjects which were considered useful but least applied were International Water Law (70 %) and Models and Decision Support Systems (61 %). When asked about the factors hampering application, 26 (of the 37) respondents claimed to have had no opportunities to apply, followed by 6 who said it was difficult to apply and by 2 who did not how to apply the knowledge gained. It was also explained by one of the participants that gaining knowledge about technical tools and role in addressing transboundary issues requires a long time. Comparing these results with the working experience of the respondents, the survey shows that almost all respondents with a working experience up to 10 yr indicated to have no opportunities to apply the knowledge gained, while amongst the group of respondents with a working experience above 10 yr – which is 40 % of the respondents – half of this group indicated to have no opportunities and the other half indicated to find it difficult to apply the knowledge gained from the MRC-FMMP Capacity Building Programme.

4.5 Change in function and/or promotion after MRC-FMMP Capacity Building Programme

The respondents were asked to indicate whether participation in the MRC-FMMP Capacity Building Programme led to a change in their function in the organisation (horizontal change or vertical change to a higher position) or gave them more opportunities to undertake their work. Table 9 presents some of the quotes given by the respondents.

HESSD
9, 3813–3849, 2012

5 Discussion and conclusions

5.1 Limitations of the study

The post training evaluation resulted in a survey response of 58 % and a good representation of the participants of the MRC-FMMP Capacity Building Programme (43 %; Sect. 3.3). Before discussing the results in the next section, we will first reflect on some of the limitations of the study. A first limitation is related to the fact that we asked respondents to self evaluate on their (un)familiarity with certain topics after some period which most probably will have lead to some bias. Measuring improvement in ability before and after training using self-assessment is difficult because scores are subjective – some participants may grade themselves relatively high and some relatively low – and respondents may tend to over-estimate their abilities. After following a training programme various participants may realise that they actually had lower competence than they initially believed before receiving the training. The results could also be biased by social-cultural factors. The fact that no respondents indicated to be not familiar with the subjects taught after the MRC Capacity Building Programme could be because of politeness and not wanting to lose face. The latter could also have been an issue because of the senior level of the participants (65 % with a working experience over 5 yr).

We used Baser and Morgan's (2008) model of capacity, change and performance as a framework for the analysis. We analysed aspects of capacity and change, but did not address performance (Sect. 3.3). We realise that to obtain a full picture of capacity, change in behavior and ultimately performance a more in-depth data collection and analysis would be needed. Also in light of the above-mentioned methodological limitations, we should be careful in drawing conclusions. We are however confident that the array of indicators assessed by a representative response group gives us adequate information to answer the questions posed related to the impact of the MRC-FMMP Capacity Building Programme and its design, and provides us with better insights on the conditions needed for change and performance.

HESSD
9, 3813–3849, 2012

5.2 Design of the MRC-FMMP Capacity Building Programme and its impact

We will first discuss the aspects of capacity enhancement assessed in the study: working experience, familiarity with three knowledge areas before and after MRC-FMMP Capcity Building Programme. The majority of the respondents was quite senior (working for their organisation over 5 yr), but working experience in the three knowledge areas assessed was much less, in particular for the respondents of training and education institutes. The results of the post training evaluation show that the participants appreciated the MRC-FMMP Capacity Building Programme both in terms of knowledge gained and skills acquired, and that this increased their capacity to address and resolve transboundary issues. Overall a substantial increase in familiarity was measured after the MRC-FMMP Capacity Building Programme. Largest increase in familiarity was measured by the respondents with limited working experience and those from training and education institutes, as they were least familiar with MRC and MRC-related subjects before attending the MRC-FMMP Capacity Building Programme. The results imply that the design of the MRC-FMMP Capacity Building Programme in terms of objectives and modalities addressing a mix of competencies was effective. The results also showed slightly higher familiarity levels after the second phase of the MRC-FMMP Capacity Building Programme, and clearly a larger increase in familiarity (lower levels before and higher levels after). This gives indications that the gradual development and updating of the MRC-FMMP Capacity Building Programme based on regular evaluations was effective. The gradual development allowed for an update of the curriculum and training material based on the evaluations. Moreover, in the second phase the pilot study was introduced as a modality at the end of the MRC-FMMP Capacity Building Programme to give participants the opportunity to apply all knowledge acquired in one – imaginary – case.

We measured "change" by several indicators relating to usefulness of knowledge addressed, application of knowledge, factors hampering application, and change in function in the organisation and opportunities in work. Almost 95 % of the respondents

HESSD
9, 3813–3849, 2012

(strongly) agreed that the knowledge gained during the MRC-FMMP Capacity Building Programme was useful for their professional work. The longer the working experience of the respondents the higher this usefulness was rated, as more senior participants given their longer working experience probably can better oversee possibilities of using new knowledge. Also specific skills addressed like building trust and cooperation were seen as very relevant. Practical application, as shown by the responses, however, proved to be more difficult. Most respondents indicated to have applied knowledge gained and shared the information with colleagues. At the same time, many respondents indicated that they also faced challenges in applying knowledge gained, whereby a lack of opportunities to apply this knowledge was mentioned the most. At the same time, respondents indicated that their familiarity had increased, but they required a much longer time to be able to apply the gained knowledge about technical tools and their role in addressing transboundary issues in their work environment. This would call for a capacity building approach in which training workshops and on-the-job training are integrated.

Like Baser and Morgan (2008) argue, the results show that the interrelations between capacity and change are complex and need to be seen in relationship to the context within which they take place, e.g., motivation of participants, possibilities to apply knowledge gained. The results also show the relevance of linking individual capacity to other levels of capacity building (Sect. 2). The MRC-FMMP Capacity Building Programme focused on the individual staff level, with limited relations to the other two levels: enabling environment, and organisational level. This is also very challenging. A good way forward would be to better integrate these capacity building activities in the capacity building strategy of the Mekong River Commission and a stronger involvement of national and regional training and education institutes.

An important aspect in the design of the MRC-FMMP Capacity Building Programme was the involvement of national and regional training and education institutes. A selection of institutes was involved from the beginning and the same group of lecturers participated in both phases. The data shows that their familiarity with the subjects

HESSD
9, 3813–3849, 2012

of addressing and resolving transboundary issues increased the most compared to the other groups. This had two positive effects. The first effect was that the lecturers through their intensive involvement in the MRC-FMMP Capacity Building Programme could play an incremental role in facilitation and lecturing. This effect appeared to be important as not all participants participated in all training modalities of the MRC-FMMP Capacity Building Programme. In practice, having a few participants as a core group throughout the MRC-FMMP Capacity Building Programme, in our case the lecturers from training and education institutes, proved to be instrumental, as they could support and guide the new participants (internal learning). A second effect relates to the use of the knowledge gained, which was relatively high for the university respondents as we saw above, and which adds to the local ownership and embedding of curriculum developed.

5.3 Next steps in the MRC capacity building

The curriculum and training material developed in the MRC-FMMP Capacity Building Programme and experiences gained are useful for the design and implementation of Phase 3. In this phase, the lecturers who participated in the first two phases of the MRC-FMMP Capacity Building Programme will adjust the curriculum for implementation at the national levels (short courses, university curriculum) and will be responsible for implementation. As teaching capacities vary and competencies to teach certain knowledge areas are still lacking, a number of approaches are considered in overcoming this. These include, training and education institutes supporting each other, introducing guest lecturers from water sector organisations like the Mekong River Commission and national line agencies and a continued capacity building like training-of-trainers and coaching to address teaching gaps.

The MRC-FMMP Capacity Building Programme focused on the addressing and resolving of transboundary flood issues. The experiences gained are useful in broadening the capacity building scope to all water and water-related transboundary issues in the Mekong River basin. At the moment the MRC is engaged in the development of

HESSD
9, 3813–3849, 2012

a module-based IWRM competency framework. This Framework aims to address the competency gaps in implementing IWRM policies and MRC procedures and related technical guidelines in the Mekong River basin in a systematic way. The experienced gained in the MRC-FMMP Capacity Building Programme provides important input to the development of this framework.

5.4 Recommendations for the design of similar capacity building programmes

The results lead into the following six recommendations for the design of similar capacity building programmes.

- Selection of the right group of participants is crucial for the success of a capacity building programme. Selection criteria related to relevance of the topics for the participants and their work/organisation is essential. Moreover, the subject of addressing and resolving transboundary issues does not only require water professionals but a mix of professionals and institutions to participate in a capacity building programme.
- The subject of addressing and resolving transboundary issues is complex and requires a mix of competencies to be addressed. Professionals involved need to be educated with specific backgrounds into team members who understand each other's background and can work in multi-disciplinary teams. This requires addressing different aspects including physical, legal, technical, social, economic and political aspects and a strong focus on the integrative nature of transboundary issues, which can be supported by training modalities like case studies and role plays representing real life situations.
- The complexity of the subject area, and in many situations its innovative character, requires a gradual development of a capacity building programme to be able to learn and update. Post training evaluation is part of this process. Such approach

HESSD
9, 3813–3849, 2012

may seem and may be more expensive, but in the end will result in a higher quality programme with stronger regional embedding.

– Involvement of national and regional training and education institutes like universities is important for embedding the capacity building efforts. These institutes should work closely with water and water-related sector organisations, like the national line agencies and river basin organisations in capacity building.

– A successful capacity building programme needs to address the three levels of capacity building (enabling environment, organisations, and individual staff). Capacity building strategies at river basin level should address these different levels taking contextual factors, like culture and local language, into account.

Supplementary material related to this article is available online at: http://www.hydrol-earth-syst-sci-discuss.net/9/3813/2012/hessd-9-3813-2012-supplement.pdf.

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HESSD
9, 3813–3849, 2012

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HESSD
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HESSD
9, 3813–3849, 2012

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HESSD

9, 3813–3849, 2012

Table 1. Knowledge areas and subjects taught in the different training modalities of the MRC-FMMP Capacity Building Programme.

Knowledge areas (and subjects)	Training modalities	Training methods
Introduction Mekong Integrated Water Resources Management Flood risk management Transboundary flood issues International cooperation	Training Workshop 1 "Water Resources Development and Flood Management in a Transboundary Context" (Month 1; duration 5 days)	Lecture Case studies (international and local) Exercises Role plays
Mekong Agreement 1995 International water law Mekong Agreement 1995' Framework of addressing and resolving transboundary issues	Training Workshop 2 "Transboundary Water Conflict Management and International Water Governance" (Month 3; duration 5 days)	Discussion Field visits
Conflict management Conflict prevention Conflict resolution Alternative Dispute resolution		
Technical tools Model and Decision Support Systems MRC Decision Support Framework (DSF) Impact Assessment methods (environment, economic, social) Strength-Weakness-Opportunity-Threats (SWOT) Role technical tools in addressing transboundary issues	Training Workshop 3 "Technical Tools to Address Transboundary Issues" (Month 6; duration 5 days)	
All above	**Shariva Pilot Study** (Month 9; duration 3 days)	Role play addressing and resolving imaginary transboundary issues

HESSD
9, 3813–3849, 2012

Table 2. Indicators assessed in the post training survey.

Indicator	Related to
Working experience	– Water and flood management – Transboundary water and flood management – Mekong River Commission
Familiarity knowledge areas in relation to addressing and resolving transboundary issues (before and after programme)	– Mekong Agreement 1995 – Conflict management approaches – Technical tools
Usefulness knowledge	– General knowledge – Specific skills
Application of knowledge	– Individual subjects taught – Application methods – Factors hampering application
Change in function in the organisation and/or opportunities in work	(open question)

HESSD
9, 3813–3849, 2012

Table 3. Mid-level professional participating in Phase 1 and 2 of the MRC-FMMP Capacity Building Programme.

Phase	Government	Training/education institutes	Total participants	Survey response
Phase 1	27	8	35	20
Phase 2	37	10 (6 same as in Phase 1)	47 (6 same as in Phase 1)	23 (6 same as in Phase 1)
Total	64	12	86	37

HESSD
9, 3813–3849, 2012

Table 4. Familiarity with three knowledge areas taught in relation to addressing transboundary issues before and after the MRC-FMMP Capacity Building Programme (n = 37)*.

Knowledge areas	Familiarity before	Familiarity after
	The Mekong Agreement 1995	
Phase 1	3.7	4.1
Phase 2	3.2	4.5
Average	3.4	4.3
	Conflict management approaches	
Phase 1	3.5	4.1
Phase 2	2.9	4.5
Average	3.2	4.3
	Technical tools	
Phase 1	3.2	4.2
Phase 2	3.0	4.3
Average	3.1	4.2

* Average score on scale from 1 to 5; 1 = Strongly disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly agree.

HESSD
9, 3813–3849, 2012

Table 5. Familiarity with three knowledge areas taught in relation to addressing transboundary issues before and after the MRC-FMMP Capacity Building Programme per organization (n = 37)*.

Organisation	Familiarity before	Familiarity after
	The Mekong Agreement 1995	
Mekong River Commission	4.0	4.6
Government	3.5	4.4
Training and education institutes	3.0	4.2
	Conflict management approaches	
Mekong River Commission	3.6	4.2
Government	3.3	4.3
Training and education institutes	3.0	4.4
	Technical tools	
Mekong River Commission	4.0	4.2
Government	3.0	4.2
Training and education institutes	3.2	4.4

* Average score on scale from 1 to 5; 1 = Strongly disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly agree.

HESSD
9, 3813–3849, 2012

Table 6. Familiarity with three knowledge areas taught in relation to addressing transboundary issues before and after the MRC-FMMP Capacity Building Programme per years of working experience (n = 37)*.

Working experience related area	Familiarity before	Familiarity after
	The Mekong Agreement 1995	
< 1 yr	2.7	4.0
1–5 yr	3.1	4.1
5–10 yr	3.3	4.3
> 10 yr	3.7	4.5
	Conflict management approaches	
< 1 yr	2.7	4.0
1–5 yr	3.0	4.1
5–10 yr	3.3	4.3
> 10 yr	3.3	4.5
	Technical tools	
< 1 yr	2.3	4.3
1–5 yr	2.9	3.9
5–10 yr	3.1	4.1
> 10 yr	3.5	4.5

* Average score on scale from 1 to 5; 1 = Strongly disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly agree.

HESSD
9, 3813–3849, 2012

Table 7. Usefulness of knowledge gained for professional work by years of working experience (n = 37).

Working experience related area	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
< 1 yr	0	0	1	2	0
1–5 yr	0	0	1	6	3
5–10 yr	0	0	0	8	1
> 10 yr	0	0	0	8	7

HESSD
9, 3813–3849, 2012

Table 8. Use of knowledge gained per organization type (multiple answers allowed) (n = 37).

Use of knowledge	Mekong River Commission	Government	Training/education institutes
Informed others	2	17	4
Gave a presentation	2	5	1
Applied in work	4	20	8
Used in lecture or training material	0	2	6

HESSD
9, 3813–3849, 2012

Table 9. Quotes given on change of function and/or having more opportunities after attending the MRC-FMMP Capacity Building Programme.

Change in function	More opportunities
• "Yes, I will be focal point for related projects" • "I will be the focal point for FMMP-MRC project implementation" • "The knowledge and skills gained from CBP supported my capacity to be in charge of a new teaching course on conflict management" • "Yes, I am now the coordinator for the FMMP (Flood Management and Mitigation Programme)"	• "Yes, most of the projects related to water have been given to me after attending the capacity building programme" • "More experiences to develop and teach courses related to conflict management" • "I have more opportunities to cooperate with other experts"

HESSD
9, 3813–3849, 2012

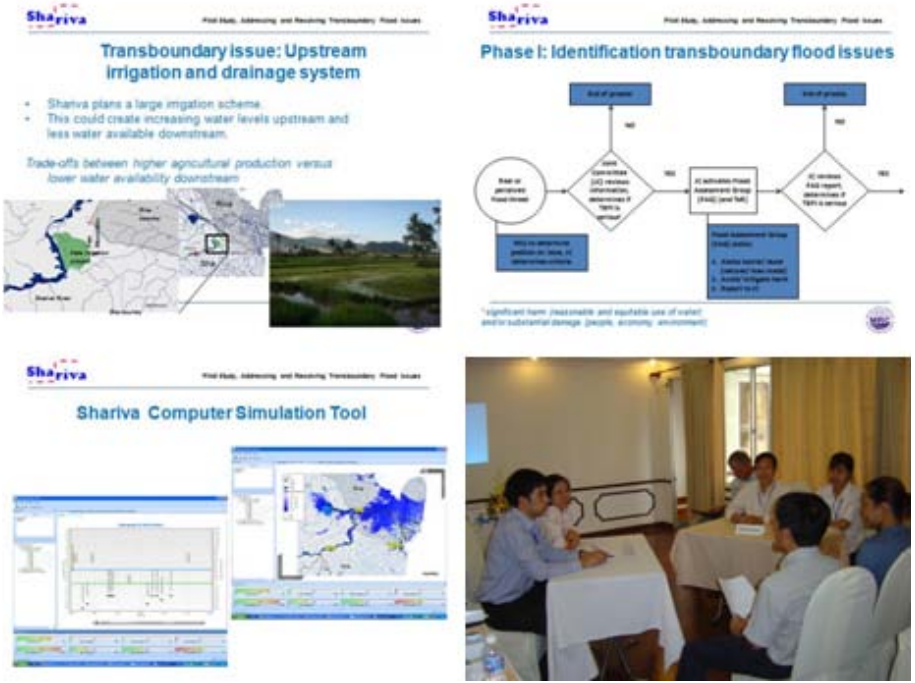

Fig. 1. Pilot study on addressing and resolving a transboundary issue. Top left the imaginary transboundary issue, top right the process of addressing the issue and mandate of institutions (in line with the Mekong Agreement 1995), bottom left an example of a tool to support the process, and bottom right simulated negotiations between parties taking place.

HESSD
9, 3813–3849, 2012

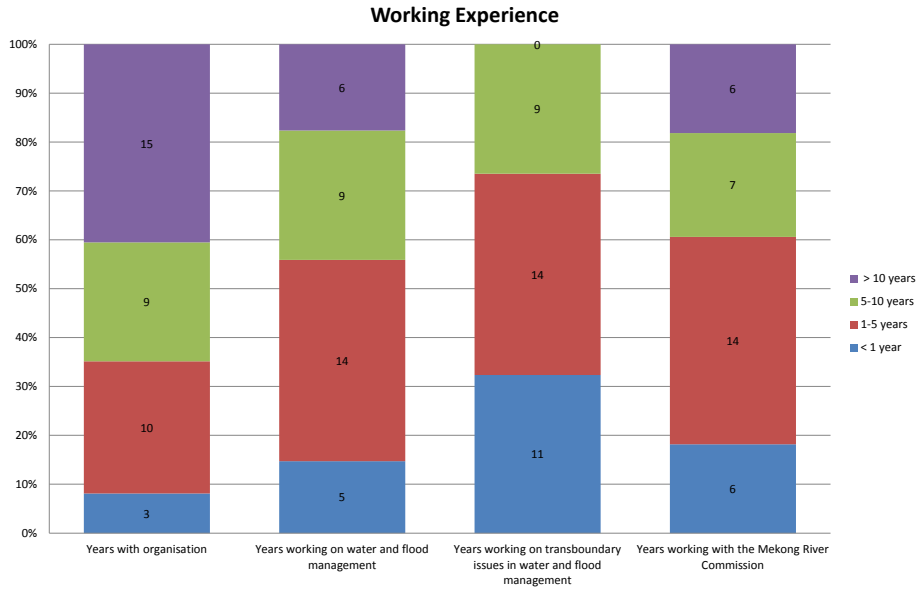

Fig. 2. Years of working experience of respondents (n = 37).

HESSD
9, 3813–3849, 2012