Emergence of Integrated Water Resources Management: measuring implementation in Vietnam

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ABSTRACT
Recently, the changes in laws and regulations, such as the revised Law on Water Resources in 2012, have sought to provide a legal framework for the internationally recognized practices of Integrated Water Resources Management (IWRM) in Vietnam. With IWRM being a novel approach for Vietnam, it would be interesting to evaluate how well water resources plans are adhering to the principles of IWRM, to learn and further tailor these principles to the Vietnamese situation. Practical approaches on how to measure the extent to which water management plans are adhering to the principles of IWRM are incomplete. They can only be used after full executing of the plan or focus, such as the ecosystem services framework, only on the sustainability of the plan itself not on the process of establishing it. We present a framework to measure the process aspects of IWRM with the constructs Integration, Participation, Gender Inclusion and Adaptation. The framework is illustrated with examples from Vietnam and directions for further research are given.

Keywords: IWRM, gender, adaptation, participation, implementation

1. INTRODUCTION

Recently, the changes in laws and regulations, such as the revised Law on Water Resources in 2012 (LWR 2012), have sought to provide a legal framework for the internationally recognized practices of Integrated Water Resources Management (IWRM) in Vietnam (Nguyen, 2013). IWRM can be defined as 'a process which promotes the coordinated development and management of water, land and related resources in order to maximize economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems.' (GWP, 2012). With IWRM being a novel approach for Vietnam, it would be interesting to evaluate how well water resources plans are adhering to the principles of IWRM, to learn and further tailor these principles to the Vietnamese situation.

Practical approaches on how to measure the extent to which water management plans are adhering to the principles of IWRM are rare. One of the few examples is a checklist, written for the Global Water Partnership that lists a range of criteria that should be met for a planning process to be a true example of IWRM (GWP, 2006). Although the checklist provides a helpful overview, in practice it is merely a checklist for practitioners on whether a country or other jurisdiction can successfully develop an IWRM strategy. Wolff et al. (2013) provide an elaborate overview of the attempts that have been made to evaluate the

success of IWRM strategies. Many problems arise, especially when plans in different countries or river basins are compared with one another. Water needs vary from area to area, and so do development drivers. A further problem of their attempt for an approach is that the success of a plan can only be measured after it has been fully implemented, while it would be desirable to measure the quality of a plan while the process is still ongoing.

Ecosystem services provide a framework to measure the sustainability of plans environmentally, socially and economically, but not the measure the process aspects of IWRM. We propose to measure these process aspects with the constructs integration, participation, gender inclusion and adaptivity. Integration follows directly from the definition of IWRM, participation and gender inclusion follow from the underlying Dublin principles (GWP, 2012). Adaptivity is added to the lists to recognize that plans are developed for complex changing systems. Although it may not be an explicit part of IWRM, adaptivity is of paramount importance when facing an unpredictable future (Haasnoot et al., 2013) and receiving increasing attention in planning of land and water resources (Timmermans et al., 2015). Given the combination of current climate challenges and subsequent uncertainties regarding its impact and large uncertainties in socio-economic development, we feel it is crucial to include this construct in the proposed framework.

In spite of the normative nature of some of these constructs, it should be noted that more is not always better. For example, citizen participation on a highly technical, specialized subject, might not help much. Adaptivity, integration and participation should be adequate for the planning practice at hand. A plan that is too adaptive might be too weak and exclude large infrastructural investments, whereas too much integration can make the planning process too complex.

Conclusion: *Recent legal changes in Vietnam have sought to provide a basis for the internationally recognized practices of Integrated Water Resources Management (IWRM). IWRM itself is a novel concept in Vietnam, raising questions about the extent to which Water Resources Management Strategies adhere to the principles of IWRM. This paper presents a framework that helps to assess four process related aspects of IWRM, integration, public participation, gender sensitivity and adaptivity. An assessment of these process indicators allows researchers and practitioners to examine the quality of a Water Resources Management Strategy prior to or during its implementation.*

2. THE FRAMEWORK

2.1 Policy integration

To measure the degree of integration, the comprehensive framework by Kivimaa and Mickwitz (2006) will be used. The framework is explained in more detail in Table 1. The aspect of coordination is added to the framework. Coordination in this respect refers to the existing mechanisms for horizontal coordination (cooperation between different agencies on the same level e.g. between two ministries or two provinces), vertical coordination (cooperation between for example a provincial department and a district department) (Lafferty, 2002).

Table 1: Definition of policy integration, adapted from Kivimaa and Mickwitz

Construct	**Definition**
Inclusion	To what extent are all aspects of IWRM (such as industrial water use, residential water use, water quality, etc.) covered?
Consistency	Have the contradictions between the aims related to different aspects of IWRM and other policy goals been assessed and have there been efforts to minimise revealed contradictions?
Weighting	Have the relative priorities of IWRM impacts compared to other policy aims been decided and are there procedures for determining the relative priorities?
Reporting	Are there clearly stated evaluation and reporting requirements for IWRM-planning including deadlines ex ante and have such evaluations and reporting happened ex post? Have indicators been defined, followed up and used?
Resources	Is internal as well as external know-how about water management available and used and are resources (e.g. budget) provided?
Coordination	What processes are there to coordinate policies between different governments, different government tiers and within governments?

Case 1: Integration in the Vu Gia – Thu Bon river basin

The Vu Gia – Thu Bon river basin is located in the provinces of Quang Nam and Da Nang. The basin actually consists of two rivers that are connected with each other, in which one of the branches is important for water supply to Danang, the fifth largest city in Vietnam. In the hydropower development plan for the Vu Gia – Thu Bon River Basin 2006-2010 a total of 40 hydropower plants were proposed. This number later rose to 60. Despite a warning in the SEA, conducted by ICEM in 2008, two years after the plan was approved, that the exploitation of so many hydropower plants would have detrimental impacts on other water uses and the environment, the construction of most of these hydropower plants went ahead. As a consequence, Danang has had trouble with its drinking water supply in dry periods, whilst floods occurred when hydropower plants discharged large amounts of water (Luu et al., 2014). These problems are to a large extent caused by a lack of integration. Two separate coordination bodies for the river basin were set up (ICEM, 2008), one with the support from the World Bank, the other with support from ADB. One coordination body is under MARD and involves both Quang Nam and Da Nang, whilst the coordination body under MONRE only involves Quang Nam Province. In addition to the coordination issues, the interests of hydropower plants were not adequately weighted against other interests, such as agriculture and drinking water supply.

***Conclusion**: The integration of different aspects of IWRM, such as flood control and irrigation, as well as integration with other policy domains (land use planning, ecology, etc.) are measured using five constructs: Inclusion, consistency, weighting (of different planning domains with one another), reporting (monitoring and evaluation of the plan) and resources (in terms of know-how and budget). The construct of coordination is added in the analysis, and looks at the current coordination practices. Recommendations for improved policy mechanisms should ideally be based on existing practices.*

2.2 Participation

Public participation can be defined as: “the process by which public concerns, needs, and values are incorporated into governmental and corporate decision making.” (Creighton, 2005, 7). Although there are some efforts dating back from the late 1960s to measure the extent of public participation in planning, such as Arnstein’s (1969) participation ladder, one single measures of participation has been seen as inadequate by scholars such as Fung (2006). A participation procedure, in which a lot of influence can be exercised, but in which only a few participants are invited is perhaps less desirable than a consultation procedure in which everybody can participate, but which offers limited scope for influence.

In response to this, Fung developed a concept which will be used in the proposed framework. He proposes three measures, which can be used to determine the degree of public participation in a planning process. The three measures can be graphically represented in a cube, which is dubbed the ‘democracy cube’(Figure 1). In this paper, we follow his approach to measure the extent to which the public can participate in the decision making process.

On the first axis of the democracy cube, we find the stakeholders invited: With the Diffuse Public Sphere is meant the mass media, secondary associations, and informal venues of discussion. On the second axis of the democracy cube, we find the modes of communication, from least intense to most intense. On the third axis of the cube, we find the extent of authority and power:
A graphical representation of the democracy cube looks is given in Figure 1.

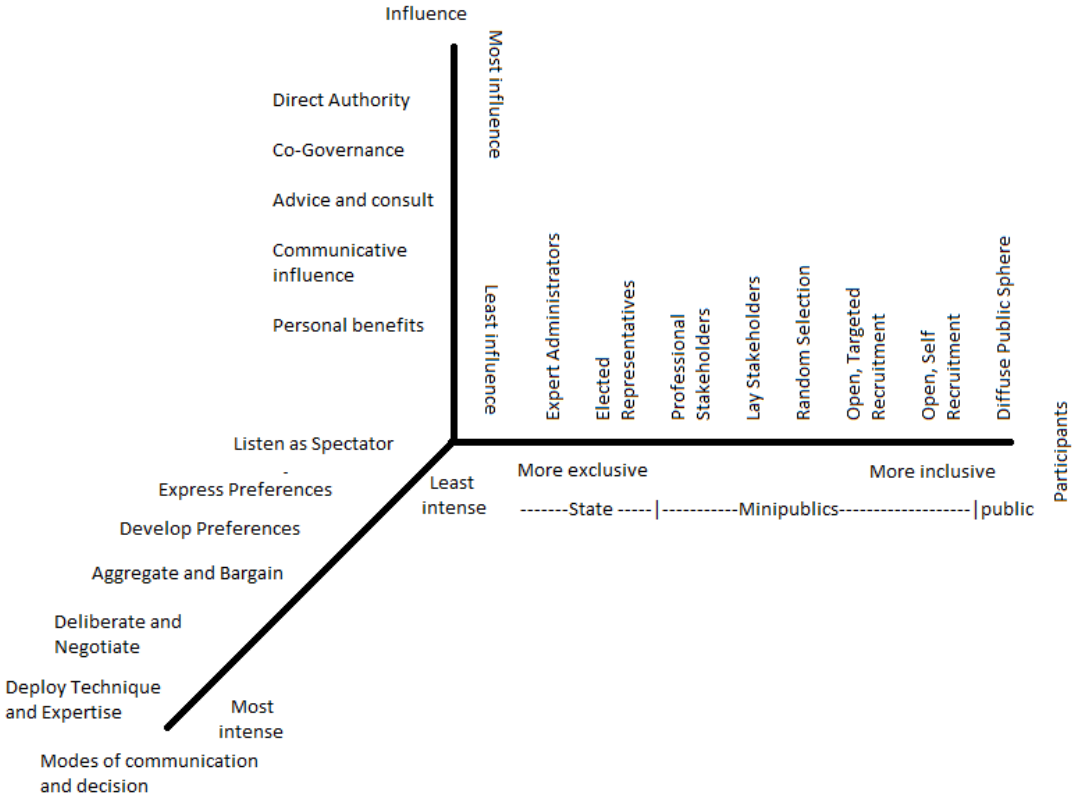


Figure 1: Fung’s democracy cube

Pablo et al. (2013) argue that Fung’s (2006) framework offers distinct advantages over other frameworks, as it substantiates the values, making it easier to empirically observe the degree of participation. The second advantage they

highlight is the fact that the model has three dimensions, this allows for measuring more diverse terms of participation. This also means that Fung's framework moves away from the premise that more participation is also better. As HarmoniCOP (2005, 14) has pointed out, public participation is desirable as long as the public can "contribute to [the quality of] decision-making". If this is not the case, public participation can be counter-productive, as a large group of stakeholders will have a harder time to come to an agreement than a small group of stakeholders. In addition, with many stakeholders involved in the process, social learning will be less likely. Furthermore, while the decision-making process will become less efficient, the costs of the process will rise (HarmoniCOP 2005, 15). Thus, different processes need different levels of public participation.

Table 2: Constructs to measure participation

Construct	**Definition**
Stakeholders invited	Which stakeholders are invited for the consultation process?
Modes of communication	How do participants in the participation process communicate with each other?
Degree of authority	How much power and authority do participants in the consultation process have?

Conclusion: *The Dublin Principles stresses that public, 'real participation' is important in IWRM, as "everyone is a stakeholder" (GWP, 2000, 15). This paragraph proposed Fung's democracy cube as a useful construct to determine the degree of public participation in the planning process. Its three determining axes – 'influence', 'participants', and 'modes of communication and decision' – allow its users measure very diverse types of participation. As such, Fung moves away from the assumption that more participation is always desirable. Rather, as pointed out by HarmoniCOP (2005, 14), public participation is only 'good' as long as the public can be of 'added-value' to the decision-making.*

Case 2: Participation under the Law on Water Resources 2012

The new Law on Water Resources, which was passed in 2012, contains some new provisions on gathering the opinions from individuals and other stakeholders regarding WRM. Investors are also required to consult with local communities, relevant organization and individuals when their projects involve exploitation of water resources or the discharging of wastewater into water resources (Nguyen, 2013). There is however limited information on how these changes played out in practice. One account from Le (2015), argues that public participation has been limited because of a lack of capacity at the lower levels. Furthermore, residents are often not aware of planning processes and governments and investors do often not disclose relevant documents. The LWR 2012 also mentions a right to complain about decisions, however these rights are not specified. This makes it in practice difficult for parties that are affected by decisions in water resource to protect their rights, especially in cases when there is a lack of participation by the judiciary (Nguyen, 2013). According to Fung's model, the participation in planning processes could therefore be characterized as: self-recruitment (but with significant barriers to entry), personal benefits, express preferences.

2.3 Gender sensitivity

Much has been written about the importance of gender equality in planning. Men and women use water resources differently (Oxfam, 2013). As a consequence of that, gender-blind water planning can exacerbate existing inequalities between men and women. WCD goes further by saying that: "Where planning is insensitive to gender, project impacts can at best be neutral, and at worst aggravate existing gender disparities to the extent of radically affecting the pre project gender balance" (WCD, 2000, p.114). In order to meet the objectives of social welfare, a gender sensitive plan is imperative.

A typical planning process can be divided into roughly three stages, in which the first two stages do not have to happen consecutively; a preparation phase in which data is collected, a planning and decision making phase and an execution phase. In all three phases, gender issues can be incorporated.

In the preparation phase, when the data is collected that should feed into the plan, the most important question is whether sex disaggregated data has been collected. Sex disaggregated data allows to give an overview of the different roles that water resources play in the lives of women and men (Oxfam, 2013). The gathering of sex disaggregated data also means that the impacts of a plan, whether positive or negative, can be assessed for both men and women.

In the public participation phase, participation of women could happen in different forms. Oxfam (2013) for example recommends having consultation sessions with men and women separately, as well as sessions in which both genders participate. However, the extent to which women can participate in the planning process is closely related to the participation process as a whole. Therefore we will base our selection of the criteria on Fung's democracy cube, which was also used for public participation (Fung, 2006). Since government officials and national assembly members are mostly male (JICA, 2011), participation processes in which only expert stakeholders or elected representatives can participate are likely to be male-dominated. A participation procedure, in which professional or lay stakeholders are invited, could mean that there are more women present (e.g. the women's union could be invited). Open public participation processes give women the chance to participate, but there is no guarantee that they will participate in the planning process. Existing gender inequalities are often reflected in the participation in decision making processes outside the home (Oxfam, 2013). Therefore, targeted recruitment of women participants, with separate consultation meetings for women, is seen as the most optimal situation in terms of women participation. In short, based on Fungs (2006) participation cube, the following order will be used, starting from least involvement of women, going to most involvement of women:

- Expert stakeholders or elected representatives
- Professional stakeholders or lay stakeholders
- Open participation
- Targeted recruitment of women

In addition to gender considerations in the planning process, gender can also be addressed in the actual plan. Even with limited participation in the planning process, and even without the use of sex disaggregated data, a planning authority could decide to direct resources to activities that strengthen the position or improve the well-being of women.

Case 3: Don Sahong hydropower in the Mekong Delta

Hydropower developments on the Mekong Mainstream are thought to seriously affect the Vietnamese Mekong Delta. Despite the concerns about the impacts, people in the Delta were not consulted about their opinion of the project. Oxfam therefore supported a group of NGOs, led by GreenID, to organise a public consultation in the Mekong Delta. The NGOs organized separate consultation sessions for women. This enabled women to take up a leading role in the consultation process. Female participants in the consultation process were asked to voice their opinions in the media. The outcomes of the consultation process were sent to the Vietnamese National Mekong Committee, which endorsed some points, including a call for wider consultations with affected communities in the Mekong Delta and elsewhere. *Proposed Mainstream Dams* http://www.mrcmekong.org/topics/sustainable-hydropower/

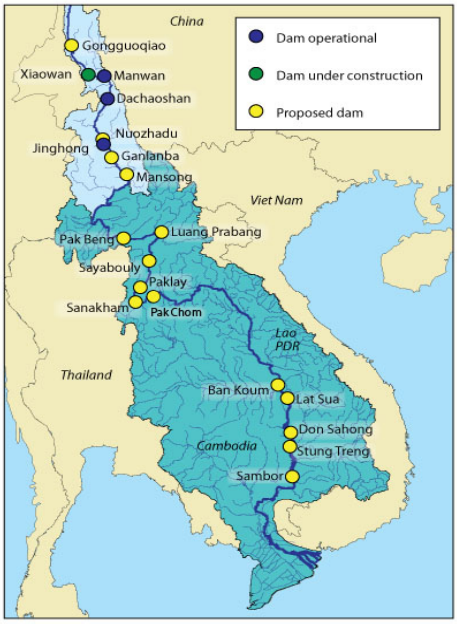


Table 2: Constructs to measure gender inclusion

Construct	Definition
Sex-disaggregated baseline data	In the planning process, there is data gathered on the way women use water and how they would like to use it.
Women participation in the planning process	Targeted recruitment of women and separate consultation sessions for women
Gender sensitive provisions in the plan	Provisions in the plan that are directly aimed at improving the position of women

***Conclusion**: Water resources planning is often gender-blind, exacerbating existing inequalities between men and women. The position of women can be improved through a water resources plan in different ways. Firstly, gender disaggregated data could be gathered in the plan making stage. Secondly, in the public participation process, separate consultations sessions for women could be held, to ensure that their wishes are taken into account. Finally, the plan itself could contain provisions aimed at improving the position of women.*

2.4 Adaptivity of planning

The concept of adaptivity in planning refers to the extent to which plans are robust across a range of plausible futures (Walker et al., 2001). Adaptivity could thus be seen as some sort of sensitivity analysis for the policies and is therefore useful for assessing the quality of a plan before it is executed.

As pointed out by Dewey (1927), and reiterated by Haasnoot et al. (2013, 486), policies should promote "continual learning and adaptation in response to experience over time". This is important, as "policies designed implicitly […] to operate within a certain range of conditions are often faced with challenges outside that range", which hinders these policies from accomplishing their goals (TERI, IISD 2006, X). Thus, to ensure that new insights – that could potentially

lead to better results – can be implemented in the planning process, and policies have a higher chance of accomplishing their goals, adaptive planning is required.
There is no set of constructs at hand to assess the adaptivity of planning processes. In order to get to a comprehensive set of constructs this article draws from literature on Adaptive Delta Management (ADM, Timmermans et al., 2015), urban forest management and general adaptive management.

Haasnoot et al. (2013) have set up 'Dynamic Adaptive Policy Pathways', based on the assumption that decision-makers are faced with uncertain future, which makes comprehensive planning very hard. One of its key features is the "use of transient scenarios representing a variety of relevant uncertainties and their development over time" (Haasnoot et al., 2013, 496). Using different scenarios in the planning phase should ensure that, once it becomes clear that a policy will not be able to reach its objective, different scenarios are at hand to straighten the 'error' (ibid., 487).

Furthermore, this article suggests using the time horizon of a plan as an indicator for adaptive planning. While strategical, long-term planning is not easy, adaptive management – whether this regards water or forest planning – is needed, as it enables decision makers to "outline required action items, prioritize implementation and accommodate long-term budget planning" (Van Wassenaer et al., 2012, 30). Also, unexpected developments, although they "may force significant reprioritisation of short- and medium-term operations", can be countered by long-term planning, ensuring that long-term goals will still be met (ibid., 30). As Haasnoot et al. (2013) point out, Collingridge (1980) has argued that, due to the impossibility of taking into account all side effects or possible future developments, flexibility can increase the "correctability of decisions". Haasnoot et al. (2013, 486) also reiterate Rosenhead (1990), who stressed that flexibility can indicate "the robustness of strategies under uncertainty".

As a final construct to assess the adaptiveness of planning, it is suggested in this article to check how often a plan is actually revised, and whether the changes are triggered by time or by events. The assumption is that, the more a plan is subject to revisions, the higher its level of adaptiveness. Since river systems vary in terms of dynamics, both in terms socio-economic and natural dynamics, an adaptive plan does not look the same in all river basins.

Table 4: Constructs to measure adaptivity

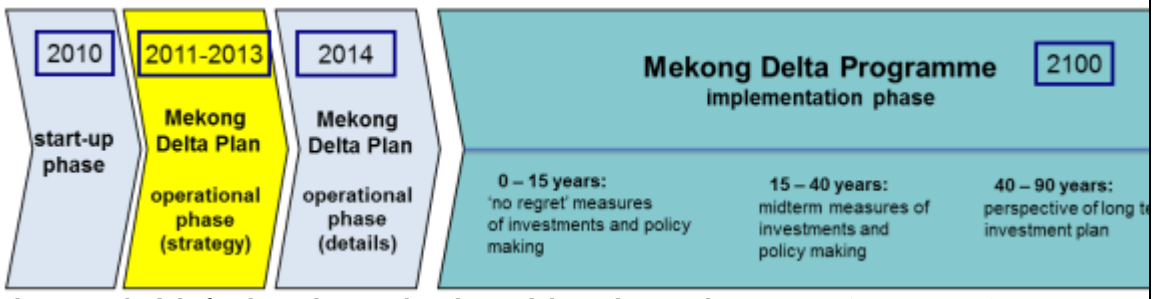
Construct	**Definition**
Scenarios	How many scenarios are used to develop the plan?
Time horizon of the plan	What period is taken into account by the plan.
Flexibility	To which extent are solutions in the planning flexible or extendable?
Revision of the plan	How often are the basic assumptions being updated and reviewed? Are revisions time-triggered or event triggered?

Conclusion: *Although not included in the Dublin Principles, this paper wants to assert the importance of adaptive planning to WRM. As the exact consequences of global climate change are not yet clear, policies in fields affected by this – i.a. water management – should take an uncertain future in to account. To measure a policy's adaptivity grade, this paper proposes analysing the Water Resources Management Plan in terms of the different future scenarios it regards, its time*

horizon and its flexibility – in other words, to what extent possible solutions are flexible and/or extendable. Additionally, one should analyse how often a plan is being revised, and whether the revision is time- or event-triggered.

Case 4: The Mekong Delta Plan

The Mekong Delta Plan, developed by a consortium of Dutch and Vietnamese partners, is an example of highly adaptive plan. In the plan, a range of scenarios are developed in terms of land use and climate change. The plan has a time horizon of almost 90 years, much longer than other plans in Vietnam that tend to have a time horizon of 15-20 years the most. When the regular master plans for the region and the provinces in the region are implemented, the current developments will be assessed. Finally, the plan prioritizes the implementation of no-regret measures. These are measures that fit to all scenarios in the plan. With the plan being approved only recently, it remains to be see how the implementation of the plan, and the reassessments of the baseline data, will take place in practice. In other words, is there sufficient institutional capacity to deal with the additional pressures that come from having an adaptive plan?



Planning schedule for the Mekong Delta Plan and the Mekong Delta Program (MDP, pp. 11)

3. DISCUSSION AND CONCLUSION

Aforementioned approach can be used to evaluate of the quality of an IWRM plan. The method is not meant as a construct to evaluate the success of IWRM plans, but rather to examine the quality of a plan by assessing the planning process. The methods provide several indicators for four aspects that determine the quality of an IWRM plan. Additionally, the methods provide clear guidance on how these indicators can be measured in practice.

Future research will focus on the application of the framework on a real-life case study in Vietnam. This should help to improve the framework and test its practicality, particularly in quantification, and highlight the extent to which limitations, such as the lack of an assessment of the overall legal framework, will impact the use of the framework.

***Conclusion**: This paper introduces four process related aspects of IWRM, integration, participation, gender sensitivity and adaptivity, which can be assessed to determine the quality of a water resources strategy. In order to make a valid assessment of the quality of the plan, information is needed about both the contents of a plan and the process towards the development of the plan. Process related information is however not always publicly available. Interviews with policy makers form another method to gather information about the*

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