The Needs for Integrated Water Resource Management (IWRM) Implementation Progress Assessment in Malaysia

Anis Syazwani Sukereman and Robiah Suratman

***Abstract*—Integrated Water Resources Management (IWRM) has attracted much global attention as the recommended approach to help countries achieve solutions to water crisis management. Many policies and programs have been set up to ensure the IWRM can be effectively implemented. However, in Malaysia the implementation of IWRM is still remains in doubt. To date, there is no authorized framework for assessing the implementation progress among various stakeholders. Although a good example of the monitoring initiatives on IWRM implementation have been developed at global and national level; it has only been used widely as general references. Therefore, the study aimed to explore the significance in assessing IWRM implementation progress, so as to offer an alternative way for progress monitoring and help stakeholders better recognize if Malaysia is on the right track in sustaining its water resources. In line, this paper promotes the need to develop a framework for IWRM Implementation Progress Assessment as a work performance guideline especially to the various stakeholders involved.**

***Index Terms*—Integrated water resources management (IWRM), water crisis management, implementation progress, assessment.**

I. Introduction

Integrated Water Resources Management (IWRM) is an emerging concept which gained increasing attention over the past two decades starting from the Rio and Dublin Conference in 1992. UNDP (2006) and GWP (2005) claimed that the IWRM concept is undoubtedly the most popular concept for water management at the moment [1]. The most cited definition of IWRM is derived from GWP in 2001 which stated that "IWRM is a process which promotes the coordination of water, land and related resources in order to maximize the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital eco-systems" [2].

While the IWRM approach is internationally accepted in principle, there are widespread critiques about the concept especially in terms of implementation progress [3]. Lack of useful indicators was seen as a constraining factor for enhanced progress of IWRM. To date, most of the good reports which have been developed at global level such as *2012 Status Report on the Application of IWRM* and 2008 *National Study for the Effective Implementation in Malaysia* which have been developed at national level had only been widely used as general references rather than to improve IWRM implementation. In fact, there are no formalized and authorized work performance guidelines to be used by the stakeholders involved in implementing IWRM activities.

Hence, the objective of this study is to examine the issues on IWRM implementation and discuss the significance of IWRM assessment in improving current implementation progress. This paper promotes the need to develop a framework for IWRM Implementation Progress Assessment as a work performance guideline especially to the various stakeholders involved in IWRM.

TABLE I: Key Milestones in the Implementation of IWRM in Malaysia

Year	Key Milestones
1998	Formation of the National Water Resources Council
1999	Selangor Waters Management Authority (LUAS) was formed
2001	Formation of My Toolbox for supported training and promoted IWRM application
2003	Establishment of Malaysian Water Partnership (MyWP)
2004	Ministry of Natural Resources and Environment, and Ministry of Energy, Water and Communications were created
2007	IWRM Dialogue with Malaysian Environmental NGOs (MENGO) programmed was conducted and a module developed to build NGO capacity
2008	Water Services Industry Act (WSIA) came into effect
2009	Ministry of Energy, Water and Communications was restructured to Ministry of Energy, Green Technology and Water and the National Green Technology Policy was published
2012	National Water Resources Study was formulated

II. Literature Review

A. Integration Water Resources Management (IWRM) Background in Malaysia

In tandem with the fast growing processes of economic development in Malaysia, many development sectors like agriculture, energy, transportation, regional development, industrial, health and environment are highly pressured with water management issues especially those related to the quality and quantity of water resources. For example, pollution in China is already so widespread that 21% of available surface water resources are unfit even for agriculture [4]. Besides, as reported in World Water Development Report, almost two billion people are affected at least by temporary water shortages in over forty countries today [5]. As such, it is therefore vital to strictly say that water

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resources should properly and efficiently managed, governed, protected and conserved as to ensure it will be a long-lasting resource for future generation sustainably usage.

Therefore, in subscribing to the principles of the Rio Declaration in Earth Summit in 1992 and the Johannesburg Millennium Development Goals of World Summit in 2002, Malaysia has adopted and implemented the IWRM principles as the way forward in developing and managing its water resources. IWRM has recently been organized and adopted in the government's Outline Perspective Plan 3 (OPP3) and its 5-year Development Plans (8th & 9th Malaysian Plan). Table I summarizes the key milestones in the implementation of IWRM in Malaysia.

TABLE II (A): MATRIX ANALYSIS ON SUMMARY OF IWRM EXISTING PROBLEMS BASED ON PREVIOUS STUDIES

IWRM problems	2003 [10]	2008 [11]	2009 [12]	2010 [13]	2011 [14]	2012 [15]
Fragmented in water resources legislation and jurisdiction		/	/			/
Complexity of constitutional framework on water resource management	/	/		/		/
Lack of practicable IWRM instruments/tools that suits different local condition						
Lack of coordination, cooperation and collaboration among government, stakeholder and local communities in water resource management				/	/	
Overlapping of authorities in managing water resource				/		
Slow implementation of IWRM			/			/
Lack of understanding in IWRM concept			/			/
No single formally constituted entity that empowered to execute IWRM						
Centralization and decentralization issues in water resource management			/		/	
No standardized water policies/ guidelines for states to adopt						

B. Problems on IWRM Implementation

In 2004, Global Water Partnership (GWP) stated that Malaysia is one of the countries that have presented some measures towards IWRM Plan implementation [6] and has adopted and continuously implemented IWRM principles in the development and management of its water resources. However, Malek *et al.* (2013) noted that in Malaysia, the transformation of the existing water management systems from "sectorial" approaches towards IWRM is still in the state of inertia [7]. Since there is no formalized and authorized framework for monitoring the progress of IWRM implementation among the various stakeholders involved, it is difficult to claim whether the current status of IWRM is effective. In addition, there are also several studies which agreed that the progress of IWRM implementation is slow and remains as a major challenge [8], [9]. Based on the brief literature from past studies, the authors decided to highlight and include several key problems that challenge the IWRM implementation by using content analysis and matrix analysis. Looking at the given matrix analysis as shows in Table II (A) and (B), it is apparent that all of the issues in implementing IWRM since the past decades are related with governance drawbacks among the various stakeholders involved in the IWRM process.

TABLE II (B): MATRIX ANALYSIS ON SUMMARY OF IWRM EXISTING PROBLEMS BASED ON PREVIOUS STUDIES

IWRM problems	2012 [16]	2012 [17]	2012 [18]	2013 [19]	2013 [20]	2013 [21]
Fragmented in water resources legislation and jurisdiction			/		/	
Complexity of constitutional framework on water resource management			/			/
Lack of practicable IWRM instruments/tools that suits different local condition	/					
Lack of coordination, cooperation and collaboration among government, stakeholder and local communities in water resource management					/	/
Overlapping of authorities in managing water resource					/	
Slow implementation of IWRM			/			/
Lack of understanding in IWRM concept			/			/
No single formally constituted entity that empowered to execute IWRM		/				
Centralization and decentralization issues in water resource management						
No standardized water policies/ guidelines for states to adopt		/			/	

Hence, the given matrix analysis shows that although the concept of IWRM has been generally accepted in theory, but the actual practice was proven more difficult. Complexity of constitutional framework on water resources management, fragmented in water resources legislation and jurisdiction, lack of coordination and collaboration among various stakeholder, slow implementation of IWRM and lack of understanding in IWRM concept are the most problems that influence the effectiveness of IWRM implementation progress.

Therefore, good governance and active participations from the stakeholders involved in IWRM implementation are the two components that need extensive attention to be tackled. This is supported in [22] who agreed IWRM should occur under and enhance good governance. Moreover, as highlighted in [13], the realization of the IWRM principles depends very much on effective water governance, where weak governance can lead to government failure, market failure and system failure. However, the need to develop a framework for IWRM Implementation Progress Assessment as a work performance guideline especially to the various stakeholders involved must be explored first.

C. Performance Indicator as a Basis of the Proposed IWRM Implementation Progress Assessment

Indicators are standards used to measure the achievement of an organization. A performance indicator is a guide to show how well organizations are doing in meeting their goals and objectives. To choose an indicator, the most important elements to consider are its reliability and validity.

High Priority	Indicator (screening made using SMART criteria)
1	IWRM principles in the national water policy
2	IWRM in national budgets
3	IWRM reflected in legislation & regulations
4	Gender mainstreaming
5	Stakeholder involvement
6	Institutional analysis and plans
7	IWRM & climate adaptation, vulnerability and risks
8	IWRM status (vision, roadmap, action portfolio, degree of implementation) and assessment of water resources
9	Information management requirements
10	Cost recovery
11	Stakeholder awareness
12	IWRM in other plans
13	Impact assessments and mitigation procedures to protect water resources
14	Capacity building
15	IWRM infrastructure implementation projects
16	Decentralisation

Fig. 1. Priority IWRM indicators for global use, tested in Zambia and Bangladesh.

The lack of useful indicators was seen as a constraining factor for enhanced progress of IWRM, and DHI which is the organization designated as a Resource Centre for the Global Water Partnership was asked to assist UN Water in developing a set of relevant indicators for monitoring the national progress towards IWRM to be presented in the 3rd World Water Development Report. Based on feedbacks from the participants, 50 indicators were narrowed down to a more easily applicable set of 16 indicators designed to be globally applicable as shown in Fig. 1 [23]. Due to the 3rd World Water Development Report, these indicators can be used for monitoring IWRM at the governance level, where the focus is on adoption and implementation of reforms [24].

III. Discussion

A. The Needs for IWRM Implementation Progress Assessment

To plan towards more integrated problem solving approaches, defining indicators, establishing benchmarks, and setting up mechanisms to ensure on-going monitoring and evaluation are the key activities in any successful strategy. IWRM Implementation Progress Assessment can assist in terms of monitoring whether the implementation process is on track, diagnosing existing problems, measuring both short- and long-term impacts, and evaluating impacts to determine if actions are indeed contributing to the larger development goals defined in the objective.

The objective of IWRM Implementation Progress Assessment is to monitor its progress and to make sure reform is designed and implemented in effective, efficient and good governance manner. It is hoped that IWRM Assessment will be widely used as the stakeholders' work performance guideline which enables all the stakeholders to commit the responsibility in implementing IWRM activities. Besides, IWRM Implementation Progress Assessment can also enhance the participation among the stakeholders involved in IWRM towards being more active and proactive, by highlighting what is expected in terms of involvement, assessing the quality of work and narrowing the implementation gaps due to the fragmented roles between them.

Therefore, from the author's point of view, assessment is the first step to trigger changes that are needed to improve IWRM performance by showing where interventions would have the most impact and the potential gaps that could be reviewed together by stakeholders that are involved in IWRM implementation. All in all, although it is beyond the scope of this paper to answer the question on how to construct the IWRM Implementation Progress Assessment framework, the author would like to briefly suggest three components to be used as variables in the framework which are; *actors and institutions, IWRM principles and IWRM performance indicators.*

IV. Conclusion

To conclude, the major challenge of IWRM remains on its effective implementation in the field. However, this approach has still become unquestionably one of the mainstream initiatives discussed by governments and stakeholders due to its impact in offering a new direction for sustainable water resources management. Besides, due to the various problems that hindering the effectiveness of IWRM implementation, it shows water resource management is currently lacking in terms of effective water governance concept. In order to assure the governance concept with IWRM is in line, it could

be merged through assessment since well-designed assessment can encourage effective and efficient progress especially when the assessment delivery is innovative and engaging. Therefore, to enhance and support the effectiveness of IWRM implementation, this paper briefly concludes that there is a need to develop a framework for IWRM Implementation Progress Assessment as a work performance guideline especially to the various stakeholders involved. Since the answers to IWRM problems and critics will not be found in past experiences, perhaps at least in the author's mind, the framework proposed can be applied as the work performance guideline and can be one of alternative method in solving future problem of IWRM implementation. Thus, it will not end only as a report that is widely used as general references but as an authorized module that shows the continuous and committed efforts by the various stakeholders involved in IWRM.

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