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Stakeholder engagement and participation in integrated river basin management: Individual perspectives in Malaysia

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Abstract: Stakeholder engagement has emerged as a fundamental tool for navigating the social, economic, and cultural complexities of integrated river basin management (IRBM). Engagement helps reconcile competing interests and promotes sustainable water resource management practices by fostering collaboration and dialogue among stakeholders. This study identifies key stakeholders, their selection criteria, and the factors that contribute to effective engagement in IRBM in Malaysia. A questionnaire survey was designed to understand individual stakeholder perceptions of the importance of engagement and the mechanisms that facilitate this, their views on how key stakeholders can be identified, and the factors contributing to effective engagement. Based on the 250 online respondents' data, factors influencing engagement effectiveness were categorised into three stages, namely, pre-engagement, during-engagement, and post-engagement. Statistical analysis carried out on the survey data ensured reliability, with Cronbach's alpha values (>0.7) indicating strong internal consistency. The Friedman test was applied to identify statistically significant differences within the same group of parameters for the three different engagement phases. Findings highlighted the importance of stakeholder inclusion, the selection criteria, and credibility at the pre-engagement stage for developing the IRBM plan. Transparent, structured participatory processes during engagement facilitated the most fruitful collaborative discussions, while post-engagement emphasised implementing stakeholder contributions and feedback, and the need for a monitoring and evaluation mechanism. The study underscores the need for an inclusive and legitimate governance model within IRBM, to enhance the effectiveness and credibility of stakeholder engagement.

Keywords: collaborative decision making, inclusive governance, stakeholder engagement, sustainability, water governance

INTRODUCTION

The World Economic Forum recently identified climate-related disasters such as floods and droughts as major global risks (Yasin, Breadsell and Tahir, 2021; Báliková *et al.*, 2024). As these phenomena are expected to intensify in the future, issues surrounding water availability and security are becoming ever more prominent (Song *et al.*, 2024). The growing global population, with its rising demand for water across industrial and agricultural sectors, as well as for potable supply and the need for hydropower production, will further add to the strain on water resources (Kimambo *et al.*, 2023).

Integrated water resources management (IWRM) has emerged as the pivotal framework for addressing the complexity of sustainable water resources management. The United Nations Educational, Scientific and Cultural Organization (UNESCO, 2009a; UNESCO, 2009b) had advocated for the implementation of IWRM reinforced by capacity development at the river basin

level, a concept often referred to as integrated river basin management (IRBM). The Organisation for Economic Co-operation and Development's (OECD) Principles of Water Governance advocate for active stakeholder engagement to ensure good governance (Akhmouch, A. *et al.*, 2020; Lim *et al.*, 2022; Heikoop *et al.*, 2024). Engagement not only fosters legitimacy and acceptance of decisions but also promotes equity and social justice by valuing the contributions of all parties (Hassenforder *et al.*, 2019; Frijns, Smith and Makropoulos, 2024; Suyeno *et al.*, 2024). Such engagement is especially important in the water sector, since this sector is fragmented and because of the need to meet both human and ecological water needs (OECD, 2021).

Done well, stakeholder engagement can enhance outcome-oriented contributions to the design and implementation of water policy (Ukpai, 2022) and help overcome the many complex problems faced when managing river basins. However, Benson *et al.* (2014) found that while the European Union Water Directive Framework mandates stakeholder involvement in drafting river basin management plans, there are challenges in ensuring meaningful participation and equitable representation (Suyeno *et al.*, 2024). Stakeholders are the people and organisations who may impact or be impacted by the outcomes of an IRBM plan (APFM, 2006). The first question, therefore, concerns which stakeholders should be involved and how decisions are reached about whom to involve. Identifying the correct stakeholders ensures that diverse perspectives are incorporated, addressing the needs and concerns of various groups (Ukpai, 2022). Stakeholder mapping can be used to identify the correct stakeholders, establish their attributes, and clarify their roles. Mitchell, Agle and Wood (1997) classify stakeholders based on three attributes: power to dominate and influence, legitimacy, which may arise from an entity's authority, and urgency, which can result in immediate attention. Aside from the characteristics of individual stakeholders, the relationships between them also need to be taken into consideration. For example, potential conflicts and coalitions between stakeholders and their agendas should be examined (Fottler *et al.*, 1989; Reed *et al.*, 2009). Too many stakeholders can render the engagement process unwieldy and unproductive, so this issue also needs to be considered.

Once chosen, stakeholders should be involved early in the IRBM planning process. This will help facilitate better communication, enable conflict resolution, foster ownership, and ensure greater acceptance of a project or programme, as well as create a sense of unity and cooperation among all parties (Frijns, Smith and Makropoulos, 2024). Empowering chosen stakeholders to actively participate alongside experts is then crucial (Eaton *et al.*, 2021), yet gaps remain in bridging technical knowledge and community input in the decision-making processes. Education levels and professional experience have been argued to significantly shape stakeholders' perceptions of basin management, resulting in the need for inclusive strategies that account for diverse backgrounds (Marshall and Duram, 2017). Enserink *et al.* (2007) highlighted the challenges posed by institutional, legal, cultural, and geographical factors in achieving effective public participation in river basin management, emphasising the need for tailored participatory frameworks. Besides the legal requirement, the social and cultural aspects of local communities are important factors to consider when planning the engagement processes. During the engagement process, strong leadership and structured facilitation are important (Lin, Ren and Ding, 2023). However, Krantzberg *et al.* (2015) stress the need to balance top-down direction from those leading the engagement with the flexibility and freedom to allow for bottom-up initiative. It is also important to consider what happens after the engagement. The lack of proper evaluation and monitoring mechanisms for engagement has been highlighted as one of the concerns in water and environment-related programmes (UNDP, 2021; Gwapedza *et al.*, 2024).

These studies underline the structural, educational, and procedural barriers to successful stakeholder engagement that occur at the pre-engagement, during engagement, and post-engagement stages of the IRBM process. Breaking down these barriers requires a clear understanding of stakeholder needs and concerns (Velasco *et al.*, 2023). This paper examines stakeholder views on their engagement in IRBM planning in Malaysia. Malaysia is typical of many countries in Southeast Asia (SEA), striving for economic development while simultaneously trying to protect its rich and imperilled aquatic ecosystems (Zieritz *et al.*, 2024). Despite its high rainfall, water shortages can occur in Malaysia, and there are growing concerns over future water resilience. River basin planning is critical for successful and sustainable water resources management, but many Malaysian basins still lack IRBM plans, and the experience and understanding of how best to engage key stakeholders remain limited. Within this context, this paper aims to: i) develop criteria to identify the stakeholders who should be involved in IRBM planning in Malaysia, and ii) understand stakeholder views on the factors that contribute to effective engagement. The paper is based on a survey that sought stakeholder views on factors across the pre-, during-, and post-engagement stages of preparing an IRBM plan.

MATERIALS AND METHODS

SURVEY QUESTIONNAIRES

An online survey was used to obtain individual stakeholders' feedback. The survey was divided into four sections:

- section A: the stakeholders' personal information, such as gender, type and size of their organisation, role in the organisation, and their level of education;
- section B: sought their views on the purpose of the engagement; the key stakeholders as driving forces behind a stakeholder engagement; the need for stakeholder engagement to be inclusive, credible, legitimate, and flexible;
- section C: sought their views on the need for stakeholders to possess knowledge and experience; their willingness to compromise and seek an amicable solution;
- section D: sought their views on the selection criteria for key stakeholders, the need for the process to be free from any political interference; the need to take into consideration the social-economic, cultural, religious, and organisational factors; the need for competent facilitators; the need for trust, and transparency; the need for clear terms of reference (TOR); the degree of impact on decision-making; the need for a mechanism to monitor and evaluate the effectiveness of the stakeholder engagement.

The 5-point Likert scale for questions in sections A-D, except for the two open-ended questions towards the end. These questions asked respondents' views on the challenges that stakeholders faced during the engagement process and suggestions for improvements in the engagement process.

A link to the online survey was sent to individuals representing all the main government agencies, government-linked companies (GLCs), and consultants involved in IRMB in Malaysia, as well as academics, employees of water utility companies, the corporate sector, developers, contractors, manufacturers, suppliers, non-governmental organisations (NGOs), civil society organisations (CSOs), and the local community. Individuals were selected based on their active involvement in engagement processes. By targeting these individuals, the survey captured a broad spectrum of views. The survey was sent separately to 1000 individuals via email and WhatsApp. The survey was left open for a period of three months, by which time a total of 250 responses had been received.

The findings are organised around the three key phases of engagement: pre-engagement, during engagement, and post-engagement. The pre-engagement phase focuses on initial stakeholder expectations and outreach strategies; during engagement examines the effectiveness of the engagement activities and participation levels; post-engagement evaluates the outcomes of the engagement efforts and stakeholder satisfaction.

RELIABILITY AND VALIDITY

Reliability refers to the regularity or consistency of data, while validity refers to the accuracy of data values or measurements. The "reliability" and "validity" aspects of the survey responses were checked using Cronbach's alpha (Vaske, Beaman and Sponarski, 2017; Viladrich, Angulo-Brunet and Doval, 2017). Values closer to 1 indicate higher reliability, while values below 0.70 are typically considered questionable. The Friedman test was used to investigate whether mean responses to questions differ; it was used since parametric tests were not applicable (Sheldon, Fillyaw and Thompson, 1996).

RESULTS AND DISCUSSION

RESPONDENT PROFILE

The majority of respondents come from government-related agencies (29.6%), engineering consultants (22.8%), and academia (14.8%). Of the 250 respondents, 46.8% had bachelor's degrees, while 29.2% had master's degrees and 21.6% were PhD holders, As for designation level, 54.8% of the respondents were at the very top management level, while 37.2% were in senior management positions. Hence, with this demographic, respondents have considerable knowledge and experience; while they are experts, they may necessarily form a fully representative cross-section of those involved in stakeholder meetings.

DATA RELIABILITY

In Table 1, Cronbach's alpha values for all items related to the effectiveness of stakeholders' engagement in river basin management are shown. All values are above 0.7, indicating high internal consistency. This, in turn, indicates that survey data can be used reliably to show stakeholder views on engagement in river basin management.

Table 1. Individual item reliability statistics for all 250 respondents received

Item	If the item dropped Cronbach's α
Proper planning	0.873
Credible and legitimate	0.876
Flexible framework	0.875
Inclusive	0.877
Multidisciplinary	0.884
Enhance the IRBM plan	0.877
Transparent	0.876
Three-day' workshop	0.892
Willing to compromise	0.887
Willing to seek amicable solutions	0.877
Free from political interference	0.893
Collaborative among all sectors	0.877
Cultural respect	0.876
Organiser as the driving force	0.877
Structured and orderly workshop	0.873
Inclusion of ESG	0.878
Committed to implementation	0.873
Stakeholders' outcome of IRBM plan	0.874
Mechanism for monitoring progress	0.875

Explanations: IRBM = integrated river basin management, ESG = environmental, social, and governance elements.
Source: own study.

SUMMARY OF RESPONDENTS' DATA

In Table S1, the responses to all the questions are summarised. These questions related to the type and purpose of stakeholder engagement, the identification of key stakeholders, the criteria for selecting key stakeholders, and some important factors impacting stakeholder engagement. The vast majority of the respondents strongly agreed or agreed with the questions related to the need for proper planning, the suggested criteria for identifying relevant stakeholders, and factors that significantly impact the effectiveness of stakeholder engagement. The following sections explore responses in more depth.

PRE-ENGAGEMENT STAGE

General information

The pre-engagement stage in the development of an IRBM plan requires examination of the clarity of the plan's objectives, and should consider the legitimacy of the engagement process, the inclusivity of participation, the multidisciplinary nature of planned discussions, and how best to establish trust among

stakeholders. These factors are deeply interconnected and collectively shape the effectiveness of the engagement process. Fulton *et al.* (2013) underscore the importance of stakeholder composition, knowledge, and motivation for the engagement process. Insights provided by the survey into these factors are detailed in the following parts.

Purpose of stakeholder engagement and motivation for participating in the engagement

Question 1 of section B of the survey looked at the stakeholder perceptions of the purpose of engagement, while question 1 of section C focused on their motivation for participating (Table 2). Responses are sorted in a descending order, using mean scores. Across the various engagement purposes and motivations, there was generally a high agreement among the respondents. This is indicated by high mean values and low standard deviation and variance values for responses such as enhancing the integrated river basin management (IRBM) plan, contributing expertise, fulfilling the requirements in the terms of reference (TOR), sharing information, fulfilling the requirements of water policy and legislation, learning something new, networking, and influencing decision-making. However, there was greater variation and lower mean scores in respondent perceptions related to reasons such as desire to represent a non-governmental organisation (NGO) / civil society organisation (CSO), representing a community, as a personal marketing opportunity or to seek recognition, or because of a formal requirement. The findings highlight the need for engagement strategies that recognise common priorities. However, the variability of opinions emphasises the importance of flexibility and tailored engagement strategies.

Table 2. Ranking of stakeholder engagement purpose and stakeholders' motivation in participating based on the mean value

Purpose of engagement	Mean	Standard deviation	Variance	Ranking
Enhance the IRBM plan	4.692	0.504	0.254	1
Contribute expertise	4.604	0.559	0.312	2
Fulfil TOR	4.476	0.724	0.524	3
Share information	4.424	0.591	0.350	4
Fulfil water policy and legislation	4.416	0.713	0.509	5
Learn new things	4.140	0.634	0.402	6
Networking	4.104	0.790	0.624	7
Influence decision making	4.068	0.944	0.891	8
Represent NGO/CSO	3.712	0.753	0.567	9
Represent a community	3.680	0.856	0.733	10
Marketing	3.368	0.927	0.860	11
Seeking recognition	2.908	1.039	1.080	12
Formality	2.556	1.467	2.151	13

Explanations: IRBM = integrated river basin management, TOR = terms of reference, NGO = non-governmental organisation, CSO = civil society organisation.
Source: own study.

The key stakeholders as driving forces for effective stakeholder engagement

Question 3 section B of the survey explored views on who the key stakeholders are, in terms of those that provide the driving force for engagement. Table 3 shows the major groups of stakeholders, ranked according to respondent views on their importance. Government agencies were considered key (most highly ranked), with 70% of respondents strongly agreeing and 29.6% agreeing with the statement that government organisations must serve as the dominant driving force. This emphasises the perception that, in Malaysia, government organisations, particularly the water and environmental-related agencies, statutory bodies, and regulators at the national (federal), state, and local authority levels are seen as critical to the success of stakeholder engagement.

Table 3. Ranking of key stakeholders (those providing the driving force that impacts the effectiveness of stakeholders' engagement) in integrated river basin management, based on the mean values of respondents

Driving force from key stakeholders	Mean	Standard deviation	Variance	Ranking
Government agencies	4.696	0.470	0.220	1
Civil societies	3.924	0.716	0.512	2
Academia	3.820	0.725	0.526	3
Public	3.508	1.173	1.375	4
Private sectors	3.472	0.923	0.853	5

Source: own study.

The CSOs can also play a notable role in driving change as a self-organised force. Based on survey responses, their influence was viewed as important. Of respondents, 19.2% strongly agreed and 56.8% agreed with the statement that these non-governmental groups, operating outside of formal government structures, are important to help advance IRBM. This finding aligns with the directive of the United Nations (UN) Economic and Social Commission for Asia and the Pacific that all governments should facilitate the participation of CSOs and stakeholders in the official agenda of the nation, including Malaysia (Sarune, Abdullah and Tumin, 2020).

The survey found that 14.4% of respondents strongly agreed that academia can be a driving force behind stakeholder engagement, while an additional 56.8% agreed with that statement. Overall, the results indicated that the majority of respondents recognise the significant influence of academia. This resonates well with the recent realisation that besides the three core missions of teaching, research, and technology transfer, universities should see part of their corporate social responsibility (CSR) as being to collaborate with civil society, industry, and government to ensure society's progression toward sustainable development (Lucchese *et al.*, 2022).

About 20.8% of respondents strongly agreed that concerned citizens represent an influential driving force in IRBM, while another 38.4% agreed with this stance. The findings suggested that over half of those polled perceive engaged members of the community as an important factor that can enable progress; however, roughly one-quarter held differing or uncertain views on the role of the public in river basin management. Overall, this

finding concurs with the views of other researchers that the public, particularly the local community, should be involved in decision-making to determine access to clean and safe water (Arthur, Saha and Kapilashrami, 2023). The inclusion of public actors, particularly disadvantaged citizens, in priority settings for universal health coverage is also enshrined in the guidelines from the World Health Organisation (WHO).

Of the five driving forces, the views on the role of private sector were most ambiguous. More or less half (53.2%) of respondents agreed that the private sector has an important role to play, but 30% took a neutral stance and 16.8% disagreed that the private sector is an influential driving force that should be included. This contrasts with wider views that each stakeholder can play a distinct role in the engagement process for the development of the IRBM plan (Yuan *et al.*, 2024). The private sector has great influence on water use and supply, so its collaboration is fundamental for achieving Sustainable Development Goal (GWP, 2018).

Selection criteria for key stakeholders

In Table 4, the responses concerning the criteria for selecting stakeholders were summarised; the mean values are sorted in a descending manner. Generally there was high consensus among respondents, reflected by low standard deviation and variance. The highest mean value was associated with the local population, followed by the ability to access and comprehend technical information. This indicates the respondents' overwhelming agreement to involve the local population and that stakeholders should be able to comprehend technical information. The need to ensure inclusion of local communities in the host organisation's policy for engagement has already suggested by Musonda *et al.* (2024).

Various researchers have highlighted that factors such as the level of interest, power, influence, legitimacy, and urgency of the stakeholder are important for selection (Mitchell, Agle and Wood, 1997). However, the results from the survey questionnaire indicate that respondents also consider practical and community-centred attributes such as local population, access and ability to comprehend technical information, local demographics, economic livelihood, literacy, women and youths, and social status to be important considerations for IRBM. These community-centred attributes highlight the importance of local representativeness in the engagement process, ensuring that local communities' diverse needs and perspectives are adequately addressed.

Table 4. Ranking of stakeholders selection criteria based on mean value

Selection criterium	Mean	Standard deviation	Variance	Ranking
Local population	4.532	0.568	0.322	1
Access and understand information	4.168	0.708	0.502	2
Local demographic	4.144	0.661	0.437	3
Economic livelihood	3.960	0.657	0.432	4
Literacy	3.876	0.715	0.511	5
Women and youths	3.856	0.809	0.654	6
Social status	3.808	0.814	0.662	7

Source: own study.

Knowledge and experience of stakeholders

Question 2 of section C of the survey sought the respondents' views on the appropriate knowledge stakeholders should possess to contribute effectively (Fig. 1). There was a very strong consensus that some general knowledge of water resources management is

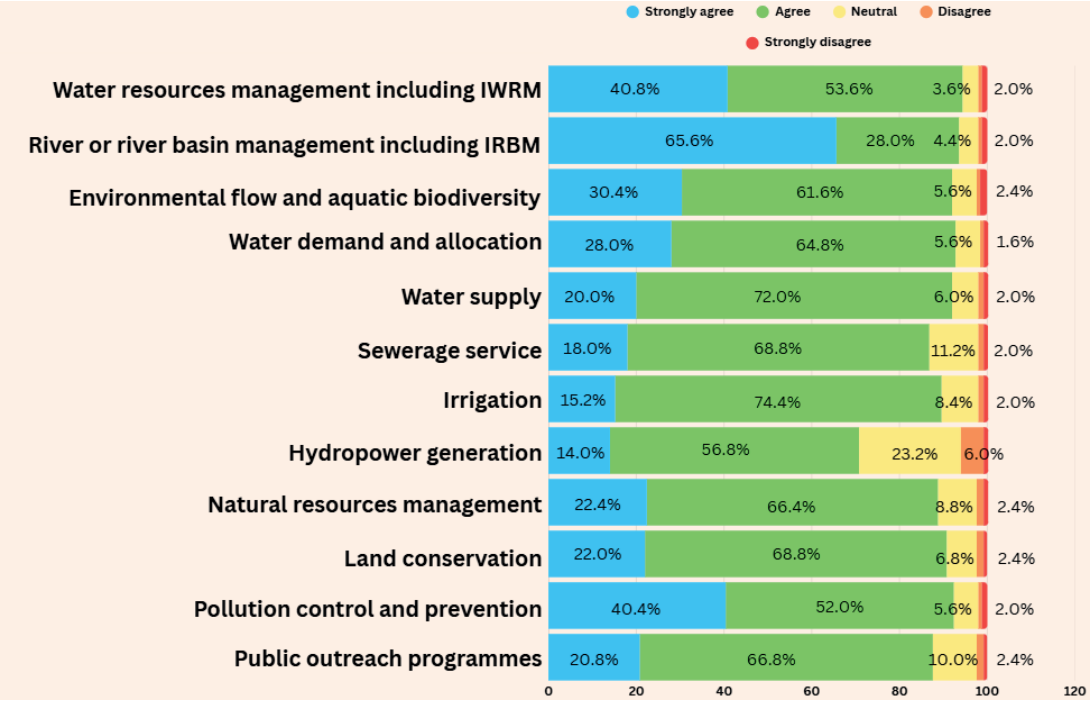

Fig. 1. Respondents' views on the type of knowledge and skills that stakeholders should possess; IWRM = integrated water resources management, IRBM = integrated river basin management; source: own study

crucial, particularly in areas related to IRBM, integrated water resources management (IWRM), river pollution, and environmental flows. With the diverse stakeholders involved in collaborative IRBM planning, having a baseline comprehension of IRBM principles helps maximise the productivity and problem-solving potential of multi-stakeholder engagement meetings.

There is hardly any literature that examines the necessity or advantage of stakeholders possessing knowledge and skills related to IRBM. Wehn *et al.* (2018) emphasised the importance of local knowledge and expertise in understanding local contexts, planning objectives, and policy measures, underscoring the value of incorporating community insights into the IRBM plan. The results from the survey align with this view, highlighting that the respondents acknowledge the advantage of having some knowledge and experience in IRBM, IWRM, pollution control, environmental flow and biodiversity, water demand, land conservation, water supply, natural resources, public outreach, sewerage service, irrigation, and hydropower. These attributes, ranked by importance, indicate that practical expertise in specific areas of water management, particularly IWRM and IRBM, is crucial for effective contribution.

DURING ENGAGEMENT STAGE

Management strategies

Five questions within the survey explored the impact of management strategies on the success of engagement. In Table 5, the five potential factors associated with implementing a stakeholder engagement strategy that can impact the effectiveness of the engagement are shown. The values (high means) indicate an overall positive perception of all five factors, while the variability for each suggests a relatively consistent opinion among the respondents. The highest preference was for a structured and orderly engagement, followed closely by a level playing field, the need to resolve conflict, the ability to accommodate multiple views, and for facilitators/workshop leaders to have the skill to reconcile differences.

Table 5. Ranking of management strategies impacting engagement effectiveness

Management strategy	Mean	Standard deviation	Variance	Ranking
Structured and orderly	4.664	0.537	0.288	1
A level playing field	4.652	0.540	0.292	2
Resolve conflict	4.648	0.584	0.341	3
Accommodate multiple views	4.636	0.587	0.345	4
Reconcilable	4.604	0.620	0.385	5

Source: own study.

Facilitating the engagement process

In Table 6, the factors facilitating stakeholders' engagement in river basin management during the engagement phase are shown.

Bryson (2004) highlighted leaders' critical role and responsibility in facilitating stakeholder engagement, emphasising the need for effective leadership to drive the process. The survey results reflect this perspective, ranking attributes such as the government organiser as a driving force, structured and orderly workshops, collaboration among all sectors, willingness to seek amicable solutions, freedom from political interference, and willingness to compromise. These attributes underscore the importance of a strong, proactive leader who can orchestrate the engagement process efficiently and inclusively. An organiser as a driving force ensures direction and momentum, while structured workshops promote clarity and productivity. Collaboration across sectors and a willingness to seek solutions and compromise highlight a leader's need to foster a cooperative and adaptive environment. Maintaining political neutrality is essential for ensuring trust and impartiality among stakeholders. Together, these qualities of leadership facilitate effective stakeholder engagement, ensuring that diverse perspectives are integrated, conflicts are minimised, and collective goals of stakeholder engagement in IRBM are achieved.

Table 6. Ranking of factors facilitating the stakeholders' engagement process

Factor facilitating stakeholders' engagement process	Mean	Standard deviation	Variance	Ranking
Government organiser as the driving force	4.696	0.470	0.220	1
Collaborative among all sectors	4.524	0.684	0.467	2
Willing to seek amicable solutions	4.496	0.767	0.588	3
Free from political interference	4.412	0.735	0.540	4
Willing to compromise	3.756	0.901	0.812	5

Source: own study.

The survey results reinforce the perceptions that the leadership qualities of the organiser, the willingness to accept amicable solutions by all parties, the absence of political interference, and the display of collaborative effort by all stakeholders will go a long way toward the success of the engagement process. These parameters, together with the appropriate communication system, are not merely checkboxes but are critical factors that influence the overall effectiveness of the stakeholder engagement in developing the IRBM plan.

POST-ENGAGEMENT STAGE

In Table 7, results related to the factors that can impact the effectiveness of stakeholders' engagement during the post-engagement phase are shown. The mean scores suggest that respondents viewed all factors to be similarly important. The relatively low standard deviation and variance indicate consensus among respondents, which bodes well for the successful execution of river basin management plans. Respondents expressed the importance of the organiser's commitment to the implementation of the stakeholders' engagement outcome. Respondents attached similar levels of importance to the requirement to have a mechanism for monitoring the effectiveness of engagement.

Table 7. Ranking of factors impacting the effectiveness of stakeholders' engagement during post-engagement based on mean value

Factors impacting the effectiveness of stakeholders' engagement	Mean	Standard deviation	Variance	Ranking
Committed to implementation	4.720	0.516	0.267	1
Stakeholders' outcome of IRBM plan	4.676	0.533	0.284	2
Mechanism for monitoring progress	4.640	0.558	0.312	3
Committed to implementation	4.720	0.516	0.267	4
Stakeholders' outcome of IRBM plan	4.676	0.533	0.284	5

Explanations: IRBM = integrated river basin management.
Source: own study.

The post-engagement phase, often overlooked in literature reviews, is critical for assessing the long-term effectiveness of stakeholder engagement in IRBM. The survey results emphasise three key attributes ranked by importance: commitment to implementation, stakeholders' outcomes integrated into the IRBM plan, and mechanisms for monitoring and progress, including evaluating the engagement's effectiveness. Commitment to implementation ensures that the plans developed during engagement are put into action, demonstrating accountability and dedication to the agreed-upon goals. Incorporating stakeholders' outcomes into the IRBM plan signifies that their contributions have a tangible impact, fostering continued engagement and trust. Effective mechanisms for monitoring progress and evaluation are essential for tracking the implementation of IRBM initiatives and making necessary adjustments. Monitoring the effectiveness of engagement and the implementation of its outcomes is critical for ensuring that the benefits of the engagement process are realised over the long term. Together, these attributes underscore the importance of a comprehensive post-engagement strategy that reinforces stakeholders' trust, ensures accountability, and promotes sustainable outcomes.

Although research on stakeholder engagement has been emerging since the early 1990s (Kujala *et al.*, 2022), there remains a significant gap in post-engagement studies, making this aspect of our study a novel and valuable contribution to the field. By focusing on the often-overlooked post-engagement phase, it provides some new insights into the long-term impact of stakeholder engagement on IRBM initiatives, offering practical and sustainable recommendations for ensuring their success.

CONCLUSIONS

The stakeholders represented in this study comprised 250 respondents, reflecting a diverse cross-section of individuals involved in river basin management in Malaysia. They encompassed a wide range of ages, industries, educational backgrounds, and job designations, contributing to a comprehensive understanding of stakeholder dynamics within this context.

Through the data from the online survey, this study identified a spectrum of factors influencing the effectiveness of stakeholder engagement across the three stages of the engagement process (pre-engagement, during-engagement, and post-engagement). In the pre-engagement stage, the analysis underscored the need for a properly planned stakeholder engagement to obtain feedback from all relevant stakeholders to enhance the development of the integrated river basin management (IRBM) plan. The results also indicate the critical importance of identifying key stakeholders, including their selection criteria, particularly the need for the inclusion of multidisciplinary local actors, preferably with some knowledge of integrated water resources management (IWRM) and IRBM, for enriching the engagement process. Furthermore, the credibility and legitimacy of IRBM plans were identified as key factors influencing stakeholder acceptance and engagement. Facilitators for stakeholder engagement should be competent, as this will lead to effective communication, thereby fostering transparency and trust between the organiser and the stakeholders, and among stakeholders.

During the engagement stage, inclusive participatory processes, initiated by the organiser, are essential for fostering collaborative discussions and developing shared visions among stakeholders. The display of strong leadership in managing structured and culturally respectful engagement workshops was highlighted as a facilitative tool for exploring collaborative and practical feedback. The results also indicate the need for stakeholders to be willing to seek amicable solutions that are free from political interference and acceptable to all parties.

As for the post-engagement stage, the findings reveal the necessity of implementing stakeholder requirements and feedback outlined during the engagement process and establishing mechanisms for monitoring progress to ensure the effectiveness of stakeholder engagement in river basin management initiatives.

The findings resonate well with the recent calls by the United Nations and other international entities to adopt the "whole of government and society" approach in implementing national, regional, and global agendas. IWRM remains a primary framework for cross-sectoral coordination needed to meet Sustainable Development Goal (SDG) target 6.5. However, the term "integration" must also be applied to the human system, whereby the government of the day, with the public at large, should shoulder the shared responsibility to address the issues of water security and hazards at the river basin level. In addition to various ministries and government agencies, efficient engagement of academia, civil society organisations (CSOs), community stakeholders, private enterprises, and citizens is essential for the effective and integrated management of the river basin. The need for their engagement was evident in responses to our survey.

By integrating stakeholder perspectives and adopting more inclusive governance models, policymakers and agencies can enhance the effectiveness of the engagement process and, ultimately, the sustainability of their initiatives contained in the IRBM plan. This study serves as a foundational step towards developing a comprehensive framework for measuring the effectiveness of stakeholder engagement in integrated river basin management in Malaysia.

SUPPLEMENTARY MATERIAL

Supplementary material to this article can be found online at: https://www.jwld.pl/files/Supplementary_material_specialissue_Lim.pdf.

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CONFLICT OF INTERESTS

All authors declare that they have no conflict of interests.

DATA AVAILABILITY STATEMENT

Data can be obtained upon request from the authors.

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