

River Governance in Focus

A Survey of Council Members and Barangay Leaders in the Iloilo-Batiano River System

Alan Dino Moscoso



Urban Studies Program

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Cover Image Credit

“Punong Barangay Joel Alvarado of Barangay Bakhaw, Iloilo City, presents the results of the workshop.”

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Urban Studies Program

Stakeholder Collaboration for Sustainable Iloilo-Batiano River System

Consultation Outcomes with Barangay Officials
of Iloilo City

28 October 2025

LEDIPO Meeting Room, Iloilo Business Center, Aduana St. Iloilo City

Alan Dino E. Moscoso, Rhodella A. Ibabao, Brian C. Ventura, Jeesslin Kent S. Gabinera,
and Nicko Jay S. Miranda



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Stakeholder Collaboration
for Sustainable Iloilo-Batiano
River System: Consultation
Outcomes with Barangay
Officials of Iloilo City

Discussion Paper Series 2025-11

URBAN STUDIES PROGRAM

Enhancing the Institutional Arrangement to Improve the Management of the Iloilo-Batiano River System Water Quality

Alan Dino E. Moscoso, Rhodella A. Ibabao,
and Brian C. Ventura

DISCUSSION PAPER

Enhancing the Institutional
Arrangement to Improve the
Management of the Iloilo-
Batiano River System Water
Quality

A Survey of Council Members and Barangay Leaders in the Iloilo-Batiano River System

Key Highlights

■ Main Argument

- Effective management of the Iloilo–Batiano River System is constrained not by the absence of stakeholders, but by unclear role delineation, weak institutional coordination, and gaps in enforcement, resulting in fragmented and often reactive interventions (e.g., clean-up drives).
- The paper argues that clarifying stakeholder roles within a collaborative governance and IWRM framework is essential to shift from short-term activities toward long-term, system-based river rehabilitation.

■ Policy Landscape

- River management operates within a multi-level governance structure involving city and municipal LGUs, barangays, national government agencies (e.g., DENR, DPWH), private sector actors, academe, and civil society.
- The Iloilo–Batiano River Development Council (IBRDC) serves as the primary multistakeholder coordinating body, but institutional coordination remains weak, with national agencies operating in silos and limited consultation with local actors.
- Existing legal instruments include the Clean Water Act (RA 9275), Ecological Solid Waste Management Act (RA 9003), and Iloilo City's Septage Management Ordinance (RO 2017-07), yet enforcement and integration across these frameworks are inconsistent.

■ Methods

- The study employs a qualitative, interpretive research design grounded in stakeholder consultations conducted in 2025.
- Data sources include:
 - Multi-sector consultations (IBRDC members and barangay officials)
 - Pre-consultation survey questionnaires (n = 69)
- Data collection methods include focus group discussions, participatory workshops, ranking exercises, and surveys, enabling triangulation.

■ Key Findings

- Water pollution is the top priority concern across all stakeholder groups, though perspectives differ (e.g., visible solid waste vs. coliform count issues).
- Clean-up drives dominate stakeholder engagement, reflecting high visibility but limited impact on structural pollution sources.
- Role concentration at the barangay level contrasts with weak enforcement and coordination at higher governance levels.
- Limited awareness of performance metrics indicates weak monitoring and evaluation systems.
- Coordination gaps among national and local agencies lead to duplication, delays, and ineffective enforcement.
- Scientific knowledge is underutilized, with weak mechanisms for integrating research into policy decisions.

■ Policy Recommendations

- Strengthen multi-level governance by formalizing an inter-LGU (Iloilo City, Oton and other municipalities under the Metro-Iloilo Guimaras Economic Development Council) and NGA covenant that clearly defines roles, shared funding mechanisms, and common goals for river health.
- Adopt an Integrated Water Resources Management (IWRM) approach to institutionalize basin-wide planning that respects the ecological unity of the Iloilo and Batiano Rivers.
- Shift from symbolic cleanups to source-level pollution control through strategic investments in wastewater treatment, septage management, and robust enforcement of effluent standards for commercial and industrial establishments.
- Empower barangays with clear mandates, training, and resources to serve as frontline enforcers and community facilitators, including authority to sanction environmental violators within their jurisdictions.
- Expand monitoring frameworks to include integrated social, economic, and environmental indicators (e.g., ecosystem service flows, community wellbeing, livelihood impacts) to support adaptive management and accountability.

- Leverage social media strategically for environmental education, real-time information sharing, and citizen-generated monitoring to complement formal reporting systems.

Introduction

Urban river systems are increasingly recognized as multifunctional landscapes that provide ecological services, economic opportunities, and social benefits. In rapidly urbanizing cities, however, rivers are often subjected to pollution, encroachment, and fragmented governance. The Iloilo–Batiano River system exemplifies these challenges. While the Iloilo River has benefited from major rehabilitation investments, including river esplanades and beautification projects, the Batiano River continues to face pressures from informal settlements, inadequate wastewater management, and solid waste accumulation.

To address these challenges, Iloilo City established the Iloilo–Batiano River Development Council (IBRDC), a multistakeholder body tasked with coordinating river management initiatives. Understanding how different stakeholders perceive river issues, roles, and priorities is essential for strengthening collaborative governance and advancing integrated water resources management. This paper analyzes survey results from IBRDC members and barangay representatives to provide empirical insights into stakeholder perspectives on river management in Iloilo City.

Objectives of the Study

The study aims to:

1. Identify the key environmental, governance, and socioeconomic issues affecting the Iloilo–Batiano River system as perceived by stakeholders.
2. Examine current and desired stakeholder roles in river management.
3. Compare perceptions and priorities between institutional actors (IBRDC members) and community-level actors (barangay representatives).
4. Assess stakeholder engagement, monitoring practices, and governance mechanisms.
5. Generate policy-relevant insights to improve collaborative river management.

Methods

■ Study Design

The study employed a descriptive survey design to capture stakeholder perceptions on river management issues, roles, and priorities. Two structured questionnaires were administered: one to IBRDC members (Part A) and another to barangay representatives from Iloilo City and the Municipality of Oton (Part B).

■ Respondents

Respondents included representatives from:

- City and municipal government offices,
- National government agencies,
- Business and private sector organizations,
- Barangay officials located along the Iloilo and Batiano Rivers.

■ Data Collection and Analysis

Survey responses were encoded and analyzed using inferential and descriptive statistics, including frequency counts and percentages. Comparative analysis was conducted to identify similarities and differences between IBRDC and barangay responses. Qualitative responses were thematically grouped to support the interpretation of quantitative findings.

Results and Discussion

Survey of the Iloilo-Batiano River Development Council Members

Table 1. Profile of IBRDC Members

Number of Participants	20 (10 male, 10 female)
Organizations/Offices Represented	■ Department of Environment and Natural Resources–Environmental Management Bureau–Region VI ■ Department of Public Works and Highways, Regional Office VI Department of Interior and Local Government–Iloilo City

	■ Iloilo City Disaster Risk Reduction and Management Office ■ Iloilo City Engineer's Office ■ Iloilo City General Services Office ■ Iloilo City Health Office ■ Iloilo City Local Culture and Arts Council–Committee on Cultural Heritage Conservation ■ Iloilo City Office of the Zoning Officer ■ Iloilo City Planning and Development Office ■ Municipality of Oton Environment and Natural Resource Office ■ University of the Philippines Visayas
Age	Range: 23–71, Average: 42

Desired State for Iloilo River

When IBRDC participants were asked about the desired state of the Iloilo River, nearly half (48.3 percent) emphasized a vision of a clean and unpolluted river, underscoring the foundational importance of water quality for all downstream benefits (see table 2). Clean water is a widely agreed global benchmark for healthy river systems because it underpins ecological functions, human health, and sustainable development. In the Philippines, the Bugang River in Antique provides a contrasting example: continuous community-based conservation, strict pollution controls, and ecotourism management have resulted in its recognition as the “Cleanest Inland Body of Water” in the country, demonstrating that sustained efforts can maintain pristine conditions even in rural contexts (Senate Resolution No. 059, 2014). Internationally, the Cheonggyecheon Stream restoration in Seoul, South Korea, illustrates how river cleanups and ecological design revitalized a formerly polluted urban waterway into a vibrant public watercourse with improved water quality and public use, drawing millions of visitors annually and becoming a symbol of sustainable urban renewal (Rashid 2025; Sustainability Directory 2025). These cases underscore the principle that achieving clean water requires integrated management actions, policy enforcement, and sustained community engagement.

Table 2. Desired State for Iloilo River

Desired State for Iloilo River	Number of Responses	Percentage of Responses
A clean river	14	48.3
A model for river ecosystem and biodiversity conservation	4	13.8
Benefits the local community and provides livelihood	3	10.3
Support sustainable development	2	6.9
Prevents flooding	2	6.9
With thriving biodiversity	1	3.4
A place for relaxation and enjoyment	1	3.4
A source of pride	1	3.4
As a heritage site	1	3.4
Total	29	100

Participants also envisioned the river as a model for river ecosystem and biodiversity conservation (13.8 percent). This reflects growing recognition of rivers as vital ecological corridors that support habitats for aquatic and riparian species and as natural infrastructure that enhances resilience. Restored rivers often provide structurally complex habitats—such as riparian vegetation, wetlands, and floodplains—that increase ecological diversity and connectivity.

Another desired outcome, highlighted by 13.5 percent of respondents, was for the river to benefit local communities and provide livelihood opportunities. Healthy rivers can support fisheries, tourism, agriculture, and related economic activities that sustain livelihoods, particularly in regions where communities are deeply connected to water resources. The Pasig River Rehabilitation Project provides a local Philippine example: improved conditions have allowed the return of aquatic life, and associated livelihood and recreational activities have emerged as part of broader urban regeneration efforts (Australian Water Partnership 2018; DENR 2021). Collectively, these aspirations reflect a multifaceted vision that integrates ecological integrity, social well-being, and economic opportunity. This holistic framing aligns with the core principles of integrated water resources management (IWRM), which emphasize the coordinated development and management of water, land, and related resources to balance ecosystem sustainability with human needs (Global Water

Partnership 2006). It also resonates with collaborative governance theory, which holds that shared visions and multi-stakeholder engagement are essential for achieving complex environmental goals across sectors and scales (Ansell and Gash 2007).

Envisioned Roles of the Iloilo River

When asked about the desired role of the Iloilo River for Iloilo City, IBRDC participants articulated a range of ecological, cultural, economic, and protective functions. These visions align with contemporary frameworks in river governance that emphasize multifunctional water systems capable of supporting biodiversity, cultural identity, sustainable livelihoods, and resilience to natural hazards. The plurality of responses—promoting biodiversity (16.2 percent), providing cultural pride and scenic beauty (13.5 percent), serving as a food source (13.5 percent), and preventing erosion and flooding (13.5 percent)—reflects a holistic view of river value that extends beyond conventional resource use (see table 3).

Table 3. Envisioned Roles of the Iloilo River

Envisioned Roles of the Iloilo River	Number of Responses	Percentage of Responses
Promote biodiversity	6	16.2
Provide cultural pride/scenic beauty	5	13.5
As food source	5	13.5
Prevent erosion and flooding	5	13.5
Provide recreation and tourism	4	10.8
Promote sustainable urban development	4	10.8
Provide transportation	3	8.1
Support livelihood	3	8.1
As heritage site	1	2.7
Provide access	1	2.7
Total	37	100

The aspiration for the river to promote biodiversity underscores the river's ecological significance as habitat for aquatic and riparian species. Urban rivers worldwide that have incorporated ecological restoration demonstrate how biodiversity can be enhanced alongside urban development. This intentional

habitat restoration and pollution control can enable rivers to function as biodiversity refugia even in highly urbanized landscapes.

Taken together, the IBRDC participants’ envisioned roles for the Iloilo River reflect a modern understanding of river systems as multifunctional resources that support ecological integrity, cultural identity, food security, and hazard resilience. These visions resonate with global examples where river restoration and integrated planning have yielded ecological, social, and economic co-benefits. Importantly, the alignment of local aspirations with international practices underscores the value of Integrated Water Resources Management (IWRM) and collaborative governance frameworks, which promote multi-stakeholder engagement, cross-sector planning, and the balancing of ecological, cultural, and development objectives (United Nations Environment Programme 2024; Global Water Partnership 2006; Ansell and Gash 2007).

Realizing these envisioned roles will require coordinated policies, sustained investment, and inclusive governance that bridges science, community aspirations, and institutional action.

Roles of Organizations in Achieving the Vision for the Iloilo River

The range of activities reported by IBRDC participants reflects the multifaceted nature of effective river management, which requires not only cleanup and community engagement but also strategic planning, systematic monitoring, regulatory enforcement, and research. A number of respondents reported involvement in these functions, with planning and monitoring (21.7 percent), water quality monitoring (17.4 percent), enforcement of environmental laws (13 percent), and research (13 percent) (see table 4). Each of these roles is essential to advance the vision of a healthier Iloilo River and resonates with broader experiences in urban river governance both within the Philippines and internationally.

Table 4. Roles of Organizations in Achieving the Vision for Iloilo River

Roles of Organization	Number of Responses	Percentage of Responses
Planning and monitoring	5	21.7
Water quality monitoring	4	17.4
Enforcement of Environmental Laws	3	13.0

Roles of Organization	Number of Responses	Percentage of Responses
Research	3	13.0
Promoting community participation	2	8.7
Provide data and technical expertise	2	8.7
Promoting solid waste management	2	8.7
Inspection of establishments	1	4.3
Coordination among sectors	1	4.3
Total	23	100

First, planning and monitoring are foundational to integrated river management because they provide the strategic direction and performance tracking needed for adaptive governance. In the Philippine context, the Pasig River Rehabilitation Commission (PRRC) historically developed multiyear river master plans that set long-term goals and milestones for water quality, shoreline improvement, and community activation programs. These plans incorporated systematic monitoring frameworks to assess progress, enabling course corrections and enhanced coordination among stakeholders (World Bank 2012).

Second, water quality monitoring is a core scientific function that informs decision-making and regulatory compliance. The fact that fewer than one in five IBRDC respondents cited water quality monitoring suggests that this scientific task remains institutionally concentrated in specific agencies rather than widely practiced across stakeholders.

Third, enforcement of environmental laws emerged as another key activity. Regulatory enforcement remains a persistent challenge in many river systems where institutional mandates are fragmented, and capacities are uneven. In Metro Manila, enforcement of pollution control laws along the Marikina and Pasig rivers involves coordination among the Department of Environment and Natural Resources (DENR), local government units, and the Philippine National Police–Environmental and Natural Resources Division, showing how enforcement requires multiagency collaboration to detect violations, issue notices, and pursue sanctions (Department of Environment and Natural Resources 2025; Moaje 2025).

Finally, the role of research, cited by 13 percent of respondents, highlights the importance of generating localized evidence for policy and planning. Research contributes to understanding riverine processes, evaluating intervention

impacts, and designing context-specific solutions. In Iloilo City, collaborations between the Iloilo City Government and academic institutions such as the University of the Philippines Visayas have produced studies on nutrient loads, benthic conditions, and community behavior that inform river rehabilitation plans.

Values that stakeholders put on the Iloilo River

The stakeholder perceptions of the Iloilo River’s values reflect a broad understanding of the multiple roles that urban rivers play in contemporary cities. When 95 percent of IBRDC members indicated that the river offers opportunities for walking, jogging, and community events, this underscores the health and recreational value of well-managed urban waterways (see figure 1). Urban rivers often serve as focal points for physical activity, social interaction, and community identity. This illustrates that riverfronts can foster healthy lifestyles and community engagement, reinforcing why Iloilo stakeholders perceive such high recreational value.

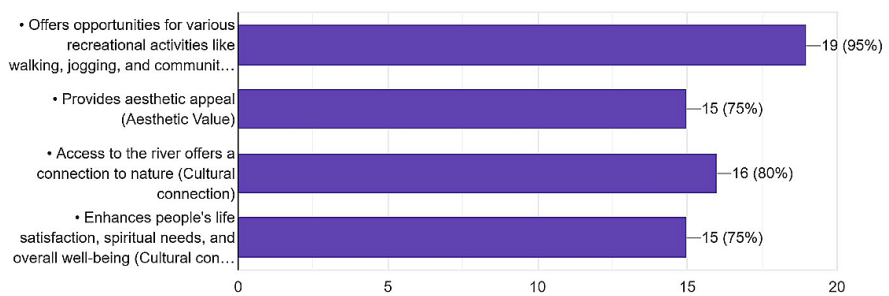


Figure 1. Perceived Values of the River in Terms of Sociocultural Functions

The equally high (95 percent) association of the Iloilo River with a good urban climate through greening reflects growing recognition of the role that water bodies and riparian vegetation play in moderating urban microclimates (see figure 2). Urban green spaces adjacent to rivers can lower ambient temperatures, improve air quality, and provide shade that mitigates the urban heat island effect. The Iloilo River Esplanade has integrated tree planting and green buffer zones along the river, not only beautifying the landscape but also contributing to cooler and more comfortable urban conditions.

The perception that the river contributes to ecological benefits such as water purification, flood control, and biodiversity conservation was reported by 90 percent of stakeholders, which aligns with established ecological functions of

river systems (see figure 3). Rivers play key roles in natural filtration, sediment transport, and habitat provision for aquatic and riparian species. In many cities globally, urban river restoration has improved biodiversity and ecological resilience.

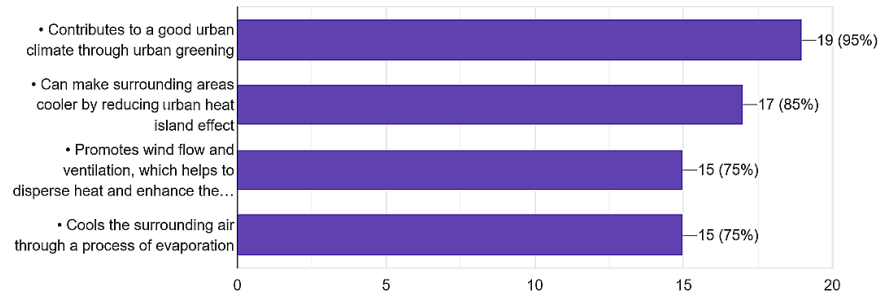


Figure 2. Perceived Values of the River in Terms of Thermal Moderation

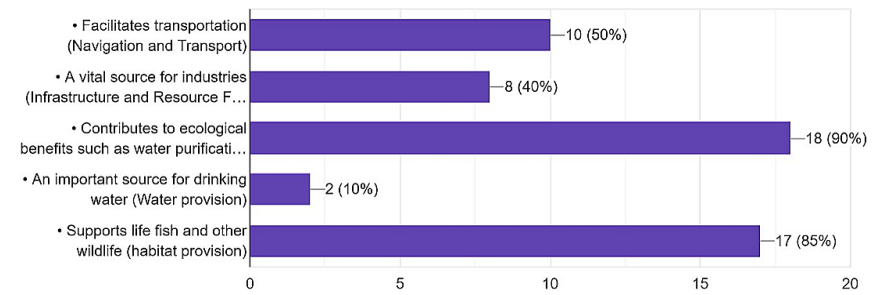


Figure 3. Perceived Values of the River in Terms of Ecological and Environmental Functions

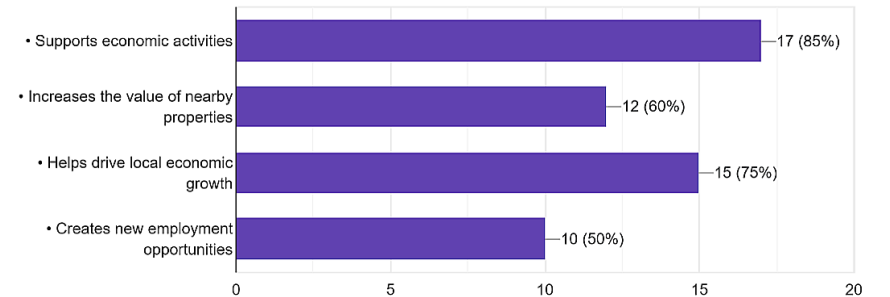


Figure 4. Perceived Values of the River in Terms of Providing Economic Opportunities

Finally, 85 percent of IBRDC members acknowledged that the Iloilo River supports economic activities, highlighting its role as an economic asset (see figure 4). Urban rivers contribute to local economies through tourism, fisheries, transportation, and river-related commerce. Riverfront developments

like the Iloilo River Esplanade have attracted visitors, stimulated nearby business growth, and enhanced property values, reinforcing the river's economic importance beyond its ecological and recreational roles.

In summary, the high valuation of the Iloilo River by stakeholders across dimensions—recreational, climatic, ecological, and economic—reflects a holistic appreciation of multifunctional urban river systems. These perceptions are consistent with broader research that highlights the diverse benefits urban waterways offer when they are protected, revitalized, and integrated into planning and governance frameworks.

Main causes of the Iloilo River's poor water quality

IBRDC members overwhelmingly attributed changes in the Iloilo River's flow, width, and depth—and the accompanying deterioration of water quality—to a combination of natural hydro- meteorological processes and human-induced pollution sources. Nearly 90 percent of respondents identified natural disasters such as floods and droughts as the principal natural causes of low water quality, reflecting how extreme hydrological events can mobilize pollutants and affect river chemistry (see figure 5). These findings align with IBRDC perceptions that hydrological extremes directly influence pollutant dynamics and physical changes in river morphology and water quality.

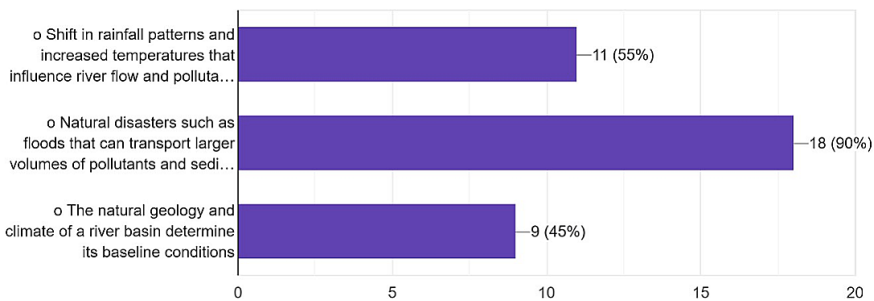


Figure 5. Natural Drivers of Iloilo River's Poor Water Quality

On the anthropogenic side, IBRDC members cited untreated or poorly treated effluent discharged from establishments and industries (85 percent) as well as inadequate solid and water waste management leading to direct dumping into rivers (85 percent) as key drivers of poor water quality (see figure 6). This pattern is well-documented globally. In Kochi, India, research on urban canals found high levels of nitrates, sulphates, and fecal coliforms largely tied to untreated household sewage and direct waste outfalls, with poor

waste management exacerbating pollution and altering seasonal water quality patterns (Sreemol 2025). These examples mirror IBRDC members’ concerns that discharge of untreated wastes and ineffective waste management systems drive urban river contamination in Iloilo.

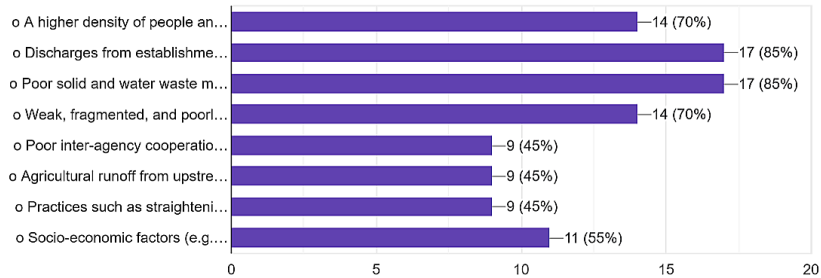


Figure 6. Anthropogenic Drivers of the Iloilo River’s Poor Water Quality

Moreover, anthropogenic pressures such as land use changes, urban runoff, and rapid development amplify the impacts of natural events. This interplay suggests that flood events not only redistribute pollutants but also interact with poor waste management practices to exacerbate contamination, consistent with local perceptions in Iloilo.

Possible causes of the changes in the flow, width, and depth of the river

The perception among IBRDC members that changes in the flow, width, and depth of the Iloilo River over the past two decades are primarily driven by siltation and erosion (28.6 percent), illegal settlers and encroachment (11.9 percent), infrastructure development (11.9 percent), and climate change impacts (11.9 percent) aligns well with extensive research on river morphology and hydrology (see table 5). Siltation and erosion are fundamentally linked to sediment dynamics in river systems, where soil loss and sediment deposition alter channel characteristics by filling riverbeds and reducing conveyance capacity, often leading to shallower and narrower or irregular channels (Rahman et al. 2024). Natural and anthropogenic erosion processes are exacerbated by altered hydrological regimes, where increased surface runoff from land cover change, deforestation, or agricultural expansion contributes excessive sediment loads that accelerate bank collapse and riverbed aggradation (Kayitesi et al. 2022; Zamroni et al. 2020). In tropical river basins undergoing rapid land use changes, loss of forest cover and expansion of human settlements intensify surface erosion, leading to changes in streamflow and channel morphology, including increased sediment deposition, altered depth profiles, and variable widths (Kayitesi et al. 2022).

Table 5. Possible causes of the changes in the flow, width, and depth of the river for the past 20 years?

Causes	Number of Responses	Percentage of Responses
Siltation and erosion	12	28.6
Illegal settlers/encroachment	5	11.9
Infrastructure development	5	11.9
Climate change impacts	5	11.9
Deforestation	3	7.1
Urbanization	3	7.1
Population growth/human-induced	3	7.1
Dredging	2	4.8
Reclamation	2	4.8
Mangrove planting	1	2.4
Government projects	1	2.4
Total	42	100

Moreover, encroachment and informal settlements within riparian zones impede natural channel migration and floodplain functions, constricting flow paths and promoting sedimentation since vegetation removal and soil compaction enhance surface runoff and bank erosion (Rahman et al. 2024). Infrastructure development, such as road construction, embankments, and unregulated urban expansion further modifies boundary conditions for rivers by altering flow velocity and sediment transport patterns, often resulting in localized erosion or deposition that changes channel shape (Zamroni et al. 2020).

In addition, climate change influences temperature and precipitation patterns, leading to more frequent and intense rainfall events that increase soil erosion and suspended sediment loads, while changes in streamflow regimes can disrupt the natural balance of erosion and deposition, thereby affecting river channel geometry (Kayitesi et al. 2022; Zamroni et al. 2020).

Collectively, these physical and human drivers interact to shape river morphology over time, supporting stakeholder perceptions that both human activities (encroachment, infrastructure) and environmental processes (siltation, climate variability) are central to observed changes in the Iloilo River's flow, width, and depth.

Metrics that organizations are using to track the environmental, social, and economic benefits of the Iloilo River

Only about 20 percent of IBRDC respondents reported awareness of the specific metrics their offices use to track the environmental, social, and economic benefits of Iloilo River programs (see table 6). This limited awareness reflects a broader challenge in local governance where performance measurement systems tend to emphasize narrow operational indicators—such as water quality (12.5 percent) parameters and solid waste quantities (6.3 percent)—while overlooking more integrated sustainability metrics (see table 7). Philippine LGUs regularly use formal performance assessment tools for governance, but these tend to be sectoral and compliance-oriented rather than holistic. For instance, the Department of the Interior and Local Government’s (DILG) Local Governance Performance Management System (LGPMS) tracks environmental governance primarily through self-assessed indicators for solid waste management, compliance with environmental laws, and basic service delivery, yet it does not systematically integrate broader ecological, social, or economic sustainability indicators such as ecosystem service flows, community wellbeing, or economic resilience (DILG, n.d.). LGPMS excludes many environmental subcomponents in practice. Similarly, national efforts to align LGU development plans with the Philippine Development Plan/ Sustainable Development Goals have produced results matrices for monitoring contributions, but these tools are often applied at the planning level and not widely operationalized within environmental offices themselves (Philippine Institute for Development Studies 2021; DILG, n.d.).

Table 6. Awareness of metrics that the respondent’s organization is using to track the environmental, social, and economic benefits of the Iloilo River

Awareness of Organization’s Metrics	Number of Responses	Percentage of Responses
I am not aware	10	50
No	6	30
Yes	4	20
Total	20	100

Table 7. Specific metrics the respondent's organization is using to track environmental, social, and economic benefits of Iloilo River

Metrics	Number of Responses	Percentage of Responses
Not applicable	13	40.6
Water quality	4	12.5
Waste collection/reduction	2	6.3
Tourism growth	2	6.3
Job generation	2	6.3
Community participation	2	6.3
Biodiversity	1	3.1
Mangrove cover	1	3.1
Community participation	1	3.1
Public use of river spaces	1	3.1
Health improvement	1	3.1
Property values	1	3.1
Households connected to sewerage system	1	3.1
Total	32	100.0

In practice, some local governments show how using only a limited set of indicators can restrict good environmental decision-making. Many municipalities focus on easily counted outputs, such as the number of garbage trucks deployed, the volume of waste collected, or compliance with basic water quality standards reported to the Environmental Management Bureau. Overall, when performance systems focus only on data that are easy to measure—such as waste volume or coliform levels—many implementers and stakeholders may not fully understand how their actions contribute to wider environmental, social, and economic goals. This lack of understanding can weaken accountability and make it harder to plan and adjust actions that support long-term river health and community well-being.

Stakeholders that perform significant contributions to enhancing the Iloilo River

The representatives of the IBRDC clearly see two main groups as most important for improving the Iloilo River: the Local Government Units (LGUs),

like Iloilo City and its barangays, and the national government agencies (NGAs), like the DENR and DPWH. The survey results show LGUs got the most votes (34.1 percent) and NGAs came second (22.0 percent) (see table 8). They must work together clearly for river management to work. Each one's success depends on the other.

Table 8. Stakeholders that perform significant contributions to enhancing the Iloilo River

Stakeholders	Number of Responses	Percentage of Responses
LGUs	14	34.1
NGAs	9	22.0
Private Sector	5	12.2
NGOs	4	9.8
IBRDC	4	9.8
Local community	3	7.3
Academe	1	2.4
Business sector	1	2.4
Total	41	100.0

LGUs are the frontline workers. Because they are closest to the people and the river, they can make and enforce local rules. For Iloilo City, this means the city must strictly enforce its Septage Management Ordinance (RO 2017-07) and make sure its land use plan protects the riverbanks from harmful construction.

National agencies provide the overall rules, expert help, and big money for large projects. Their job is to support LGUs and make sure all efforts fit together. For example, the DENR sets the national water quality rules. But it needs to do more than just set rules; it must actively help LGUs by doing technical checks and training local enforcers. Right now, this teamwork is weak. LGUs often don't have enough expertise or power, and NGAs work on their own projects without fitting them into local plans.

To make this happen, the IBRDC should help create a strong inter-LGU and NGA covenant. This formal agreement would clearly define everyone's jobs, set up shared funding, and create common goals for a healthier river. Without this kind of true partnership, the LGUs and NGAs will keep working separately, and the Iloilo River will not get better.

Current roles that stakeholders have been performing to achieve the vision for the Iloilo River

The data shows that IBRDC members see themselves playing two main roles right now. First and most important (95 percent) is bringing people together and building a shared plan—the IBRDC masterplan (see figure 7). The second role (70 percent) is watching over projects and giving feedback to make them better. While 70 percent for monitoring and feedback is still a majority, it is notably lower than the 95 percent for planning. This tells us there is a gap. Stakeholders are better at talking about the plan than they are at actively checking the work. This is a common problem. It's easier and less confrontational to have meetings than it is to point out when a project is behind schedule, over budget, or not working as promised. Without strong monitoring, even the best plans can fail. For example, a new sewage treatment plant might be built, but if no one is formally checking to see if it is actually cleaning the water properly over the long term, the river will not get better.

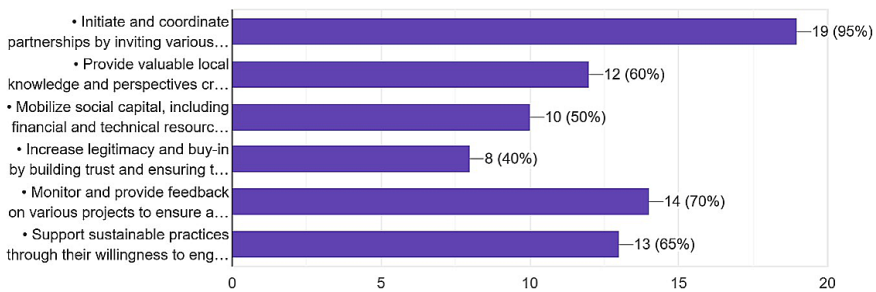


Figure 7. Mechanisms already in place to achieve an effective Iloilo River management

The IBRDC members identified institutional coordination as the most critical mechanism that is already in place for achieving effective Iloilo River management. A large majority emphasized the importance of having a dedicated office or council to harmonize policies and initiatives across agencies with water-related mandates (80 percent), as well as the establishment of an interagency or interlocal task force to clearly define roles and responsibilities within the shared river territory (80 percent). These findings underscore persistent coordination challenges in the current governance arrangement and reflect a strong demand for clearer institutional leadership and accountability. Additionally, respondents highlighted the mainstreaming of river management goals into urban planning and land-use regulations (75 percent), recognizing that unregulated development continues to undermine water quality improvements. Engagement of the private sector in managing its environmental impacts—particularly through transitions toward cleaner production methods—was also identified as a key mechanism

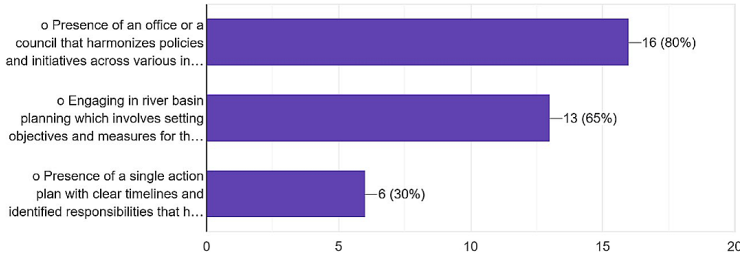


Figure 8. On integrated water resource management (IWRM) framework

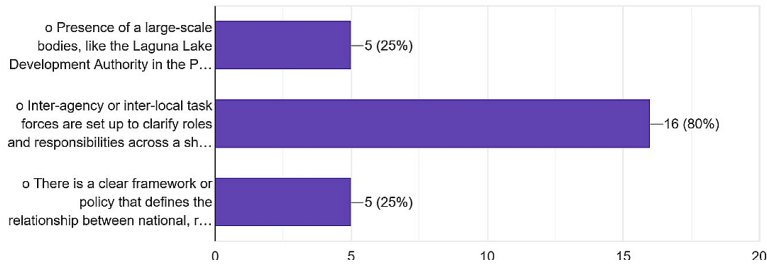


Figure 9. On multilevel governance structures

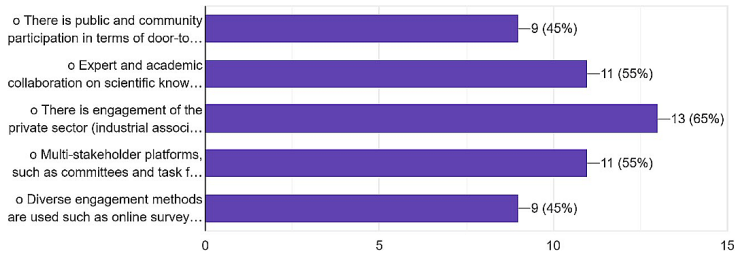


Figure 10. On stakeholder partnerships

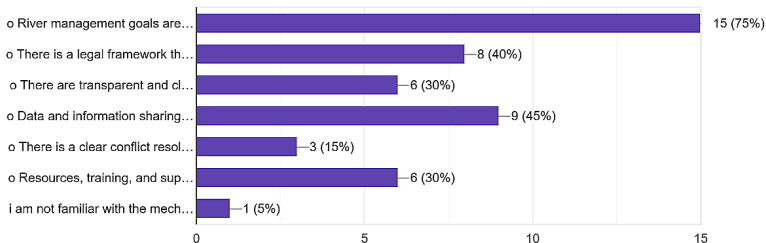


Figure 11. Supporting institutional and legal instruments

(65 percent), although it ranked slightly lower than institutional coordination. Taken together, these responses suggest that stakeholders view effective river management as fundamentally dependent on integrated governance structures that align planning, regulation, and private sector accountability rather than isolated or project-based interventions (see figures 8–11).

However, this top-down perspective contrasts sharply with ground-level experience. The very coordination mechanisms deemed operational by the council are reportedly not fully functional or felt by frontline stakeholders, specifically barangay representatives and the business sector, indicating a significant implementation and communication gap between the coordinating body and its constituents.

Personal engagements on river conservation and protection

In their capacity as IBRDC members, respondents are actively involved in river cleanup drives as well as in the planning and organization of activities related to the Iloilo River (see table 9).

Table 9. Personal engagements on river conservation and protection in general

Engagement	Number of Responses	Percentage of Responses
Cleanup drives	5	25.0
Planning, facilitation and review	5	25.0
Proper waste segregation and disposal	3	15.0
Research study/technical assistance	3	15.0
Mangrove planting	2	10.0
Infrastructure construction	1	5.0
IEC Activities	1	5.0
Total	20	100

River cleanups are highly visible and easy to understand. Participants can see the immediate results of their labor—bags of collected trash, cleaner riverbanks, and visibly improved riverfronts—which provides a sense of accomplishment and feedback that reinforces engagement (Pretty 2003).

River cleanups often require minimal training, resources, or expertise, making them accessible to people of diverse ages and backgrounds. They typically involve short, well-publicized events that can fit into a weekend or community calendar, contrasting with complex tasks such as watershed monitoring or technical policy engagement. In Iloilo City, consultations revealed that citizens and barangay officials alike associate river conservation primarily with cleanup drives. Barangay cleanups are often promoted through local announcements

and social media, and they are seen as socially rewarding group activities. This ease of entry encourages broad participation across socioeconomic groups, including students, families, and informal community networks. Participating in river cleanups can confer social recognition and reinforce community identity. In many Philippine communities, cleanup programs are tied to festivals, such as the “Bangka Race” on the Batiano River during the Barangay San Antonio fiesta in Oton, Iloilo, and school volunteer programs, making participation a source of pride and social capital.

Another reason cleanups dominate personal engagement responses is that many people equate pollution with visible trash rather than less visible issues such as nutrient loads, wastewater discharge, or chemical contamination. Participants in the Iloilo–Batiano River consultations frequently described pollution in terms of floating solid waste, rather than systemic water quality issues.

Studies have shown that awareness of complex environmental issues such as watershed management, hydrology, and industrial pollution tends to be lower among the general public compared to knowledge about litter and waste management (Ojala 2015). Social media and local information campaigns often emphasize cleanup events and waste segregation, but less frequently address the science of river ecology or the causes of pollution beyond trash. This skewed information environment shapes individual perceptions of what “river conservation” means in practice.

In the Philippines, the prevalence of social media platforms for environmental communication often reinforces this pattern. Posts documenting cleanup events, before-and-after photos, and event hashtags are more common and more shareable than technical presentations on water quality parameters or policy discussions. While cleanups play a valuable role in raising awareness and mobilizing volunteers, the literature suggests that relying on them exclusively risks reinforcing superficial understandings of river problems and underemphasizing deeper structural issues such as wastewater management, land-use governance, and long-term behavior change.

How should the public be educated about flood forecasts and river information?

The IBRDC participants were unanimous in identifying social media platforms as the most accessible means for the public to obtain information about the Iloilo River (Table 10). This observation is supported by existing studies, which show that social media is effective because it promotes two-way public

engagement, democratizes access to environmental information, and facilitates collective responses to environmental issues (Xie et al. 2024; Rinda 2025).

Table 10. Top priority areas for river management for the next ten years

Communication Platform	Number of Responses	Percentage of Responses
Social media	13	54.2
Programs and projects	3	12.5
Traditional media	3	12.5
Early warning systems	1	4.2
Seminars	1	4.2
SMS alerts	1	4.2
Identification of responsible agency	1	4.2
Schools	1	4.2
Total	24	100

The results show the growing importance of social media as a platform for environmental education and pollution-related information, a finding that is highly relevant to the governance challenges observed in the Iloilo–Batiano River System. In Iloilo City, stakeholder consultations revealed persistent gaps in environmental awareness, behavior change, and information flow, despite regular cleanup activities and formal communication by government agencies. These gaps suggest limitations in relying solely on traditional information channels such as barangay assemblies, printed notices, and government reports, and point to the potential value of social media as a complementary tool for river management.

Studies in the Philippine context show that social media platforms—particularly Facebook, YouTube, and TikTok—are among the most influential sources of environmental information, especially for young people and urban residents (Abbas et al. 2025). This finding aligns with observations from Iloilo, where many river-related behaviors, including improper waste disposal, are linked to daily household practices and youth behavior. Integrating river-focused environmental education into social media platforms commonly used by Iloilo residents could therefore strengthen awareness and reinforce messages delivered through formal education and barangay-level information campaigns.

For the Iloilo–Batiano River System, this suggests that social media could play a strategic role in reframing river stewardship from a compliance-driven activity, such as mandatory cleanup drives, into a shared civic responsibility. Local governments, the Iloilo–Batiano River Development Council (IBRDC), and civil society organizations could use social media to highlight positive practices, showcase community-led initiatives, and communicate the ecological and economic importance of the river in ways that resonate emotionally with the public.

Beyond education and advocacy, the literature also points to the value of social media as a source of environmental information and informal monitoring. Abreo et al. (2019) demonstrate that user-generated content on platforms such as Facebook can provide valuable data on pollution impacts that are difficult to capture through conventional monitoring alone. While their study focuses on marine litter, the approach has clear implications for the Iloilo–Batiano River System, where residents frequently observe illegal dumping, wastewater discharges, and flooding events. Social media posts, photos, and reports could complement official monitoring by DENR and LGUs, particularly if mechanisms are established to validate and respond to citizen-generated information.

Compared with traditional media platforms, social media offers advantages that are especially relevant to Iloilo’s governance context. Traditional media and formal reports remain important for structured communication and regulatory processes, but they are often slow, one-directional, and inaccessible to many community members. Social media, by contrast, enables rapid information sharing, interactive dialogue, and real-time feedback (Ilagan 2024). These features could help address the coordination and transparency gaps repeatedly identified in the Iloilo–Batiano case, particularly if agencies use social media to share water quality updates, project progress, and enforcement actions in accessible formats.

Priority areas for river management for the next ten years

The IBRDC respondents were presented with a list of river-related concerns and asked to identify their two highest priority areas for river management over the next ten years. The results indicate that the IBRDC members’ top priorities are water quality and pollution, governance, and community engagement (see figure 11). Water pollution emerged as the foremost concern across all stakeholder groups—including IBRDC members, barangay representatives, and business sector participants. However, stakeholders conceptualize the pollution

problem differently. IBRDC members and barangay officials tend to associate pollution primarily with visible solid waste floating on the river, whereas business sector representatives emphasize the unpleasant odor emanating from the river, which they report as negatively affecting customers and commercial activities.

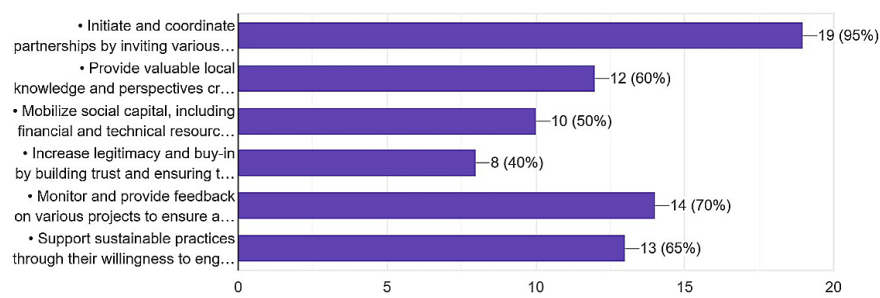


Figure 12. Aspects of Iloilo River management should be prioritized for the next 10 years

The prioritization of governance and community engagement—defined in the survey as strengthening communication mechanisms among stakeholders, improving policy enforcement, and enhancing environmental education and community-led conservation—mirrors the concerns raised by both the business sector and barangay representatives regarding weak coordination with the local government. Business participants noted that their engagement with LGU-led river initiatives is limited, citing infrequent information-sharing and a lack of formal invitations to participate. Similarly, barangay officials expressed frustration over their limited authority to apprehend or sanction commercial establishments within their jurisdictions, despite directly observing environmental violations.

Notably, only one respondent identified coordination with national government agencies as a priority concern for the next decade. This finding contrasts with the researchers’ observation that national government agencies often operate in institutional silos, implementing river-related projects with limited consultation and feedback mechanisms involving the IBRDC. This discrepancy may indicate that coordination with national agencies is either not perceived by local stakeholders as an immediate concern or was underemphasized because it was not explicitly included in the original list of options provided in the survey.

Similarly, heritage conservation was mentioned by only one participant as a priority issue. Although the Iloilo River is historically and culturally significant,

heritage values received limited attention during the consultations, rendering this concern comparatively less salient among stakeholders. This suggests that cultural and historical dimensions of river management remain not fully integrated in current governance and planning discussions.

Survey of the Barangay Representatives in the Iloilo-Batiano River System

Table 10. Profile of Barangay Representatives

Number of Participants	49	
Barangays Represented	Iloilo City ■ Bakhaw ■ Bolilao ■ Bonifacio-Arevalo ■ Desamparados ■ Dungon A ■ Inday ■ Mohon ■ Navais ■ North Fundidor ■ North San Jose ■ President Roxas ■ San Agustin ■ San Jose ■ San Rafael ■ Santo Domingo ■ Seminario ■ South San Jose ■ Santa Cruz ■ Santo Niño Sur ■ Tabucan ■ Tap-oc ■ Yulo	Oton ■ Alegre ■ Botong ■ Buray ■ Cagbang ■ Lambuyao ■ Poblacion East ■ Poblacion North ■ Poblacion West ■ San Antonio Oton ■ San Nicolas
Age	Range: 21–73 years, Average: 47 years	
Distance of Barangay Centroid to the River	Range: 45 meters to 4,189 meters, Average: 798 meters	
Position in the Barangay	Barangay Official: 63.3% Others: 36.7%	
Category	Non-student: 77.6% Senior Citizen: 20.4% Student: 2.0%	

Issues affecting the Iloilo and Batiano Rivers

To assess changes in the river’s management priorities, participants were presented with a list of issues originally identified in the 2002 IBRDC Master Plan. They were instructed to rate each issue’s current importance on a scale of 1 (least important) to 10 (most important). This method allowed for a direct comparison of past and present stakeholder concerns, revealing the evolution of challenges facing the Iloilo–Batiano River.

The survey identified clear priority issues for each river. For the Iloilo River, the problem of a “deficient garbage disposal system and non-segregation of organic and inorganic solid waste” was ranked highest ($\bar{x}$ = 8.24) (Table 11). In contrast, “illegal fishing” was the lowest-ranked concern ($\bar{x}$ = 5.93). The latter finding aligns with the observed reduction of fish traps following the Iloilo City government’s sustained enforcement campaign. All other issues received statistically equivalent scores, indicating no clear secondary priority.

For the Batiano River, stakeholders were most concerned with “poor water quality” ($\bar{x}$ = 8.9) and “deficient garbage disposal system” ($\bar{x}$ = 8.7). “Illegal fishing” was again the least pressing issue. These ratings are corroborated by focus group discussions (FGDs), which described the Iloilo River as relatively “cleaner” than the Batiano River, a perception likely influenced by the high-visibility Esplanade project and other beautification efforts concentrated on the Iloilo River.

Finally, statistical analysis showed no significant difference ($p > 0.05$) between the ratings of barangay officials ($n = 31$) and non-barangay officials ($n = 18$), indicating a strong consensus on these priorities across different stakeholder groups.

Table 11. Analysis of Variance on the Issues Affecting Iloilo and Batiano Rivers

ILOILO RIVER SUMMARY				
Groups	Count	Sum	Average	Variance
Deficient garbage disposal system/non-segregation of organic and inorganic waste	29	239	8.241	2.833
Poor water quality	29	228	7.862	4.980
Laxity in the issuance of Environmental Compliance Certificate and the monitoring and regulation of environmental and sanitation requirements of industrial and commercial establishments	29	224	7.724	4.135

ILOILO RIVER SUMMARY				
Groups	Count	Sum	Average	Variance
Lack/inadequate infrastructure facilities for public access to and from the river that otherwise could draw public interest, create awareness, and appreciation of the Iloilo River	29	224	7.724	3.278
Absence of sanitary facilities and a clean water supply for the majority of informal settlers	29	221	7.621	5.672
Encroachment/reclamation activities along the river	29	216	7.448	5.399
Presence of solid wastes and other floating debris	29	215	7.414	4.608
Lack of data/information on the economic valuation of the different industrial and commercial activities and businesses along the Iloilo River	29	204	7.034	6.106
Siltation or persistent sediment loading	29	203	7.000	4.286
High incidence of respiratory diseases among residents near the river	29	203	7.000	7.071
Presence of informal settlers	29	201	6.931	9.352
Seasonal unpleasant odor emanating from the river	29	199	6.862	5.837
Some barangay officials are not keen on protecting the river from abuse (encroachment, garbage disposal, etc.)	29	198	6.828	5.862
Absence of proper administrative boundaries and legal easements affecting accessibility and river protection	29	197	6.793	5.241
Illegal fishing practices	29	172	5.931	7.495

ANOVA						
Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	264.0301	14	18.85929	3.919537	2.35E-06	7.173796
Within Groups	2165.226	450	4.811613			
Total	2429.256	464				

Effect of Distance to the River

To assess the influence of geographic proximity, the distance from each respondent’s barangay centroid to the nearest river segment was measured and analyzed against survey responses. The analysis revealed a statistically significant negative correlation ($r = -0.582$) between distance to the Batiano River and perceptions of informal settlement encroachment. This indicates that respondents living closer to the Batiano River are more likely to report the presence of informal settlers, suggesting heightened awareness or greater concern about this issue. Notably, no such correlation was found for the Iloilo River, highlighting informal settlements as a distinct, spatially defined priority for Batiano River management that warrants targeted intervention.

Influence of Age

A noteworthy demographic pattern emerged: respondents’ age significantly influenced their perceptions across several key issues, as detailed in table 12. A clear trend indicates that older participants consistently reported higher levels of concern than their younger counterparts. Issues of particular concern for older respondents include the lack of economic valuation data for riverside businesses, ambiguous roles of barangay officials, undefined administrative boundaries, and the high incidence of respiratory illnesses within riverside communities.

Table 12. Correlation of Age of Respondent to the Issues Affecting the Iloilo and Batiano Rivers

ILOILO RIVER	Age of Respondent		
	Pearson Correlation	Sig. (2-tailed)	N
Encroachment/ reclamation activities along the river	.562*	0.045	13
Presence of informal settlers	.658*	0.014	13
High incidence of respiratory diseases among residents near the river	.729**	0.005	13
Seasonal unpleasant odor emanating from the river	.561*	0.046	13
Some barangay officials are not keen on protecting the river from abuse (encroachment, garbage disposal, etc.)	.753**	0.003	13
Lack of data/information on the economic valuation of the different industrial and commercial activities and businesses along Iloilo River	.760**	0.003	13

ILOILO RIVER	Age of Respondent		
	Pearson Correlation	Sig. (2-tailed)	N
Illegal fishing practices	.595*	0.032	13
Absence of proper administrative boundaries and legal easements affecting accessibility and river protection	.743**	0.004	13
BATIANO RIVER			
Deficient garbage disposal system/non-segregation of organic and inorganic solid waste	.533*	0.023	18
Absence of sanitary facilities and clean water supply for the majority of informal settlers	.593**	0.010	18
Some barangay officials are not keen on protecting the river from abuse (encroachment, garbage disposal, etc.)	.490*	0.039	18
Lack of data/information on the economic valuation of the different industrial and commercial activities and businesses along the river	.536*	0.022	18
Illegal fishing practices	.477*	0.045	18
Absence of proper administrative boundaries and legal easements affecting accessibility and river protection	.590**	0.010	18

* Correlation is significant at the 0.05 level (2-tailed).

** Correlation is significant at the 0.01 level (2-tailed).

Stakeholders that perform significant contributions to enhancing the Iloilo and Batiano Rivers

The barangay representatives' identification of the City LGU (31.2 percent), local community (20.4 percent), and barangays (18.3 percent) as the main contributors to improving the Iloilo and Batiano Rivers reflects a governance pattern commonly observed in urban river systems in the Philippines, where responsibility is perceived to be concentrated at the local government and community levels rather than evenly distributed across all actors (see table 13).

Table 13. Stakeholders that perform significant contributions to enhancing the Iloilo and Batiano Rivers

Group/Entity	Count	Percentage
City LGU	29	31.2
Local Community	19	20.4
Barangay LGU	17	18.3
Private sector	8	8.6
NGOs	6	6.5
NGAs	4	4.3
Business owners	4	4.3
Civil Society Organizations	2	2.2
Academe	2	2.2
JS Layson	1	1.1
MIWD	1	1.1
Total	93	100.0

The prominence of the City LGU is consistent with its formal mandates over urban planning, environmental regulation, infrastructure development, and enforcement. In the Philippines, cities are primarily responsible for implementing the Clean Water Act (RA No. 9275), the Ecological Solid Waste Management Act (RA No. 9003), and local land use plans, which directly shape river conditions. Similar findings have been reported in other Philippine cities, such as Marikina City, where the city government's investments in flood control, riverbank rehabilitation, and relocation programs were widely perceived as the main drivers of river improvement (Porio 2011). The high percentage attributed to the City LGU in Iloilo, therefore, reflects both institutional reality and stakeholder expectations that cities should lead river rehabilitation efforts.

The significant role attributed to the local community (20.4 percent) underscores the importance of everyday practices and social participation in river management. Communities directly influence river conditions through household waste disposal, sanitation behavior, and participation in cleanup and monitoring activities. The barangay respondents' recognition of communities reflects an understanding that river health cannot be achieved through policy alone but depends on collective behavior change and local stewardship.

The identification of barangays (18.3 percent) as key contributors highlights their function as frontline governance units. Barangays are responsible for mobilizing residents, implementing solid waste management at the neighborhood level, and coordinating cleanup drives and information campaigns. In Iloilo, barangays are often the most visible actors along the river, which helps explain why respondents perceive them as significant contributors despite their limited formal authority over wastewater regulation and commercial establishments. This suggests that while barangays are highly active and visible, their contributions are largely operational rather than structural.

Taken together, these perceptions reveal a local-centric view of river governance, where responsibility is concentrated on city LGUs, communities, and barangays, while national agencies and the private sector are less visible. This aligns with critiques in the literature that multilevel governance arrangements often fail to make higher-level or less visible actors accountable at the local level (Ansell and Gash 2007). From an Integrated Water Resources Management (IWRM) and collaborative governance perspective, the findings suggest a need to rebalance roles by strengthening coordination with national agencies and formalizing private sector responsibilities, while continuing to support and empower communities and barangays as essential partners rather than sole bearers of river stewardship.

Current roles that stakeholders have been performing to achieve the vision for the Iloilo and Batiano Rivers

The barangay representatives' responses—that cleanup activities (45.8 percent), solid waste management (14.6 percent), and environmental monitoring (10.4 percent) are the primary roles currently performed by stakeholders to achieve the vision for the Iloilo and Batiano Rivers—reflect a pattern widely documented in urban river governance, particularly in developing-country contexts (see table 14). These roles emphasize visible, community-level, and action-oriented interventions, while more technical and regulatory functions remain less prominent.

Table 14. Current roles that stakeholders have been performing to achieve the vision for the Iloilo and Batiano Rivers

Roles/Activities	Count	Percentage
Cleanup	22	45.8
Solid Waste Management	7	14.6

Roles/Activities	Count	Percentage
Environmental Monitoring	5	10.4
IEC	4	8.3
Ordinance	3	6.3
Dredging	2	4.2
Mangrove Planting	2	4.2
River Rehabilitation	1	2.1
Research	1	2.1
Baroto (Boat) Race	1	2.1
Total	48	100.0

The dominance of cleanup activities as the most cited role mirrors findings from numerous studies in the Philippines and abroad, where river cleanups are the most common and socially acceptable form of environmental engagement. Cleanup drives are easy to organize, highly visible, and provide immediate, tangible results, making them attractive to barangays and communities with limited authority and resources. The prominence of cleanups suggests that stakeholders equate river protection primarily with waste removal rather than with systemic interventions such as wastewater management or land-use control.

The identification of solid waste management (14.6 percent) as the second most important role reflects barangays' formal mandates under the Philippine Ecological Solid Waste Management Act. Barangays are legally responsible for waste segregation at source, collection, and the operation of materials recovery facilities, making solid waste management one of the few environmental domains where they have clear authority. The barangays focus on responsibilities within their jurisdiction, even if these have limited influence on overall river water quality.

The lower but notable emphasis on environmental monitoring (10.4 percent) suggests an emerging but still constrained role for barangays and communities in observing and reporting river conditions. Community-based monitoring—such as reporting illegal dumping, observing changes in water color or odor, and participating in basic water quality testing—has been shown to complement formal government monitoring systems. The relatively low percentage for monitoring in Iloilo suggests that while stakeholders recognize its importance, monitoring is not yet institutionalized or adequately supported at the barangay level.

Taken together, these responses highlight a practice–mandate gap in river governance. Stakeholders gravitate toward activities that are visible, socially rewarding, and within their immediate control—such as cleanups and waste management—while more complex functions like continuous monitoring, enforcement, and pollution prevention remain underdeveloped. From an integrated water resources management (IWRM) and collaborative governance perspective, this pattern underscores the need to better integrate barangay-led actions into a broader basin-wide strategy. Cleanups and waste management should be treated as entry points for engagement, but they must be complemented by stronger coordination with city governments and national agencies responsible for wastewater regulation, land-use planning, and water quality standards. Without this integration, stakeholder efforts risk remaining fragmented and reactive, rather than contributing to sustained improvements in the Iloilo–Batiano River system.

Personal engagement in river conservation and protection

The barangay representatives’ responses indicate that their personal engagement in river conservation and protection is primarily expressed through cleanup drives and meetings (31.6 percent), solid waste management activities (31.6 percent), and information, education, and communication (IEC) dissemination (18.4 percent) (see table 15). This pattern reflects a form of environmental participation that is community-based, action-oriented, and closely aligned with barangay-level mandates, a trend widely documented in both Philippine and international studies on local environmental governance.

Table 15. Personal engagement of respondents on river conservation and protection

Personal Engagement	Count	Percentage
Cleanup drives and meetings	12	31.6
Solid waste management	12	31.6
Information dissemination campaign	7	18.4
Tree/Mangrove planting	5	13.2
Wastewater management	2	5.3
Total	38	100.0

The strong emphasis on cleanup drives and meetings underscores the role of barangay officials as mobilizers and coordinators of collective action. Cleanups

are among the most common entry points for individual engagement because they are visible, socially rewarding, and logistically feasible within barangay capacities.

The equal importance given to solid waste management (31.6 percent) reflects the fact that this is one of the few environmental functions where barangay officials have clear legal authority and daily operational involvement. Under the Philippine Ecological Solid Waste Management Act, barangays are directly responsible for waste segregation at source, collection, and community-level enforcement. The Iloilo findings, therefore, suggest that barangay representatives focus their personal efforts on areas where they can exercise direct influence and see tangible outcomes.

The role of IEC dissemination (18.4 percent) highlights the educational and communicative dimension of personal engagement. Barangay officials frequently act as intermediaries between city policies and local residents, translating environmental regulations and programs into locally understandable messages. However, studies also caution that IEC efforts are most effective when paired with enforcement and infrastructure, and awareness does not always translate into sustained behavior change (Porio 2014).

Main causes of the Iloilo and Batiano Rivers’ poor water quality

The barangay representatives’ perceptions that improper waste disposal (44.4 percent), septage or domestic wastewater (28.9 percent), and industrial/commercial waste (13.3 percent) are the main causes of poor water quality—particularly low dissolved oxygen (DO) and high fecal coliform levels—in the Iloilo and Batiano Rivers are strongly supported by empirical evidence from the Philippines and other countries (see table 16). Together, these factors represent the dominant urban pollution pathways affecting river systems in rapidly urbanizing areas.

Table 16. Perceived Causes of the Iloilo and Batiano Rivers’ Poor Water Quality

Causes	Count	Percentage
Improper waste disposal	20	44.4
Septage	13	28.9
Industrial/commercial waste	6	13.3
Illegal fishing	1	2.2

Causes	Count	Percentage
Illegal settlers	5	11.1
Total	45	100.0

The identification of improper waste disposal as the leading cause reflects the widespread contribution of solid waste to urban river degradation. Solid waste, especially plastics and organic refuse, enters rivers through direct dumping, poorly managed collection systems, and stormwater runoff. Once in the river, organic waste increases biochemical oxygen demand (BOD), reducing dissolved oxygen levels critical for aquatic life, while plastics obstruct flow and create anaerobic conditions in stagnant sections. The barangay respondents' emphasis on improper waste disposal reflects their daily exposure to this highly visible and persistent problem.

The second most cited cause, septage and domestic wastewater, is a well-documented driver of fecal coliform contamination in Philippine rivers. Many urban and peri-urban areas lack centralized sewerage systems, relying instead on septic tanks that are poorly designed, inadequately maintained, or illegally connected to drainage canals that discharge directly into rivers. The barangay respondents' recognition of septage highlights growing awareness that water quality problems are not only about visible garbage but also about less visible sanitation failures.

The lower but still significant attribution to industrial and commercial waste (13.3 percent) reflects the presence of point-source pollution from establishments such as restaurants, hotels, small manufacturing facilities, and service industries along riverbanks. Effluents rich in organic matter, nutrients, grease, and chemicals can further depress dissolved oxygen levels and introduce pathogens if wastewater treatment systems are absent or poorly maintained. In Iloilo City, stakeholder consultations have similarly noted that only a limited number of businesses operate functional sewage treatment plants, increasing the risk of untreated effluent discharge.

Barangay-led actions on waste disposal are necessary but insufficient unless paired with city- level investments in sewerage and septage management and stricter enforcement of effluent standards for commercial and industrial establishments. The barangay respondents' assessments, therefore, provide an accurate, experience-based diagnosis of the causes of poor water quality in the Iloilo–Batiano River system and reinforce the importance of integrated, system-wide solutions.

Aspects of Iloilo and Batiano River management that should be prioritized for the next 10 years

The barangay representatives’ prioritization of solid waste management (28.0 percent), wastewater and water quality management (26.0 percent), and river widening or dredging (18.0 percent) as key areas for the next ten years reflects a pragmatic and experience-based understanding of the pressures facing the Iloilo and Batiano Rivers (see table 17). These priorities align closely with challenges observed in other Philippine cities and in urban river systems globally, where immediate, visible problems coexist with longer-term structural and hydrological concerns.

Table 17. Aspects in Iloilo and Iloilo River management that should be prioritized in the next 10 years

For prioritization in the next 10 years	Count	Percentage
Solid waste management	14	28.0
Wastewater/water quality management	13	26.0
River widening/dredging	9	18.0
Illegal settlers’ relocation	5	10.0
Community engagement	3	6.0
River easement	2	4.0
Mangrove	2	4.0
Flood control	1	2.0
Seawalls	1	2.0
Total	50	100.00

The emphasis on solid waste management as the top priority underscores the persistent and highly visible nature of solid waste pollution in urban rivers. Barangay officials are directly involved in waste segregation, collection, and community enforcement under the Ecological Solid Waste Management Act, making this issue both familiar and actionable. The

barangay respondents’ prioritization of this issue reflects the need for sustained behavioral change, improved collection systems, and stronger enforcement at the neighborhood scale. Closely following solid waste management, wastewater and water quality management emerged as a critical concern, highlighting

growing awareness that less visible pollution sources—such as domestic sewage and commercial effluents—are major drivers of poor river health. In many Philippine cities, including Iloilo, centralized sewerage systems are limited, and reliance on septic tanks leads to untreated or poorly treated wastewater entering rivers. The high ranking of wastewater management suggests that barangay representatives increasingly recognize the need for upstream, system-level interventions beyond solid waste control.

The prioritization of river widening and dredging reflects concerns about flooding, siltation, and reduced river conveyance capacity—issues that directly affect communities living along riverbanks. The barangay respondents' inclusion of this priority reflects immediate community concerns about flooding, but it also points to the need for careful integration of engineering solutions with ecological and land-use planning.

Conclusion

The survey results reveal strong alignment among stakeholders regarding the importance of improving water quality and managing solid waste in the Iloilo–Batiano River system. However, gaps persist between strategic planning and on-the-ground implementation, as well as between visible actions and systemic solutions. While cleanup activities dominate engagement, long-term river rehabilitation requires strengthened governance, integrated monitoring, and sustained coordination across institutional levels.

The findings underscore the relevance of collaborative governance and IWRM principles in addressing complex urban river challenges. Effective river management in Iloilo City depends on aligning stakeholder roles, enhancing data-driven decision-making, and empowering local actors within a coherent basin-wide framework.

Recommendations

Effective management of the Iloilo–Batiano River System requires a shift toward a more integrated, coordinated, and accountable governance framework. This begins with strengthening multi-level governance through a formalized covenant among local government units—particularly Iloilo City, Oton, and other municipalities within the Metro Iloilo–Guimaras Economic Development Council—and national government agencies, clearly defining

stakeholder roles, shared financing mechanisms, and common river health goals. Anchoring these efforts in an Integrated Water Resources Management (IWRM) approach will ensure basin-wide planning that reflects the ecological unity of the Iloilo and Batiano rivers.

To operationalize this, a stakeholder role matrix should be institutionalized alongside clear accountability mechanisms, supported by an empowered Iloilo–Batiano River Development Council to improve coordination and decision-making. At the same time, enforcement must be strengthened by enhancing wastewater regulations and implementing joint enforcement mechanisms between LGUs and national agencies, while shifting away from symbolic clean-up activities toward addressing pollution at its source through sustained investments in wastewater treatment and septage management. Barangays should be capacitated as frontline actors through clearer mandates, training, resources, and authority to act against environmental violators. Complementing these governance reforms, an Open-Access River Data Portal should be developed to support real-time monitoring, transparency, and evidence-based planning, alongside expanded monitoring systems that incorporate social, economic, and environmental indicators for adaptive management. The private sector should be more effectively engaged through a combination of regulation and incentives to ensure compliance and encourage sustainable practices. Strengthening science–policy linkages, including the institutionalization of advisory mechanisms and regular reporting, will further ground decision-making in evidence. These efforts must be reinforced by aligning national and local investments within a unified river basin management plan and by enhancing environmental education and community engagement, including integrating sustainability into school curricula and leveraging social media for awareness, real-time information sharing, and citizen-based monitoring. Collectively, these strategies promote a transition from fragmented, activity-based interventions to a coherent, system-oriented approach capable of sustaining long-term river health and community well-being.

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