Final report

Systems mapping report for BWDB

Shifting from a project-based to a process-driven organisation

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Acronyms

ADB	Asian Development Bank	**AM**	Asset Management
AMS	Asset Management System	**BIWTA**	Bangladesh Inland Water Transport Authority
BNR	Build-Neglect-Rebuild / Build–Neglect–Repair	**BUET**	Bangladesh University of Engineering & Technology
BWDB	Bangladesh Water Development Board	**CAPEX**	Capital Expenditure
CEGIS	Center for Environmental and Geographic Information Services	**DAE**	Department of Agricultural Extension
DDC	Development Design Consultants Ltd.	**DEW**	Dockyard and Engineering Works
DPHE	Department of Public Health Engineering	**ECB**	Engineering Construction Brigade
ECNEC	Executive Committee of the National Economic Council	**EKN**	Embassy of the Kingdom of the Netherlands
ERD	Economic Relations Division	**GIS**	Geographic Information System
Gpwm	Guidelines for Participatory Water Management	**IPD**	Institute for Planning and Development
IWM	Institute of Water Modelling	**IWFM**	Institute for Water and Flood Management
JICA	Japan International Cooperation Agency	**LDC**	Least Developed Country
LGED	Local Government Engineering Department	**MoF**	Ministry of Finance
MoWR	Ministry of Water Resources	**MRI**	Maintenance Reliability Index
MTBF	Medium-Term Budget Framework / Mean Time Between Failures	**NGO**	Non-Governmental Organization
O&M	Operation and Maintenance	**OPEX**	Operational Expenditure
PPP	Public-Private Partnership	**Raci**	Responsible, Accountable, Consulted, Informed
RVO	Netherlands Enterprise Agency	**SDAR**	Shadow Digital Asset Registry
UP	Union Parishad	**V-L-L**	Values-Loyalties-Losses
WMC	Water Management Committee	**WMO**	Water Management Organization



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Executive Summary

Context, methodology, key findings, recommendations and conclusion.

Executive Summary

1. Context

Bangladesh's coastal polder system, a network of embankments, sluice gates, and drainage regulators protecting millions of people, has played a critical role in reducing flood risks, safeguarding lives and livelihoods, and supporting agricultural growth and food security across the coastal region. However, like many large-scale water infrastructure systems around the world, it faces persistent operation and maintenance (O&M) challenges. In Bangladesh, these challenges have contributed to a self-perpetuating cycle of Build–Neglect–Rebuild (BNR), where infrastructure is constructed, left without adequate maintenance, deteriorates under monsoon and cyclonic stress, and is eventually rehabilitated or rebuilt at substantial public cost. This study, commissioned by the Netherlands Enterprise Agency (RVO) under the Partners for Water (PfW) Programme and carried out by Innovision Consulting Private Limited, diagnoses the institutional drivers of this cycle and charts a pathway toward more sustainable and process-driven water infrastructure management.

The study contributes to the broader objectives of the Bangladesh Delta Plan 2100 (BDP2100) and is aligned with national water sector priorities of the Government of Bangladesh and the Bangladesh Water Development Board (BWDB). This report focuses on Phase 1, a comprehensive systems mapping of the institutional, financial, and behavioural landscape that sustains the BNR cycle, and lays the analytical foundation for Phase 2, a co-created reform roadmap. The analysis builds on the earlier BNR Root Cause Analysis and Asset Management Gap Analysis conducted under the assignment. The central ambition of the assignment is to enable BWDB to become a process-driven organization — one where planning, budgeting, procurement, O&M, and accountability are governed by standardized, data-informed, and continuously monitored procedures rather than by the ad hoc logic of individual project cycles. The systems analysis also directly informs four ongoing PfW initiatives: (1) the Asset Management Roadmap implementation led by Dr. Hala Alhamed; (2) the WWA capacity-building programme; (3) the performance-based contracting pilots; and (4) the institutional and coordination model for Polder 31.

2. Methodology

After conducting a review of relevant documents, the study utilised the Market Systems Development (MSD) framework to map the root causes of the BNR cycle through a structured analysis of four functional markets — infrastructure construction, operation and maintenance, asset management, and financing — within the water sector. Each market was examined through its demand and supply dynamics, supporting functions, and governing rules. The analysis established that all four markets are structurally biased toward reconstruction over maintenance — and that their compounded failure is the root cause of the BNR cycle's institutional stability. Stratified purposive sampling covered 38 key informant interviews (KIIs) across seven stakeholder categories. Full stakeholder mapping matrix is in Section 3.2 of the report. Four research questions guided the analysis: (1) What formal and informal institutional arrangements reinforce the project-centric BNR cycle? (2) Where are the structural entry points for reform? (3) Who are the individual and institutional champions capable of driving change? And (4) what coordination strategies are needed to build consensus for a sustainable polder management?

3. Key Findings

The study documents the BNR cycle across three concrete cases: sluice gate mis-management in Polder 31 (Khulna), embankment breaching for saline aquaculture in Dacope Upazila (October 2025 breach), and recurring canal siltation following Engineering Construction Brigade (ECB) projects. In each case, the pattern is identical — capital investment without a structured O&M commitment, followed by accelerating deterioration and eventual emergency reconstruction. Full case analysis appears in Section 3.3.1.

The MSD analysis mapped four functional markets — infrastructure construction, operation and maintenance, asset management, and financing — that collectively govern how polder-level water infrastructure is planned, built, maintained, and funded. Each market was examined through its demand and supply dynamics, supporting functions, and governing rules. The analysis reveals a single structural logic common to all four: each market is oriented toward reconstruction rather than prevention, and the failures of each amplify the others.

The infrastructure construction market is biased against durability. BWDB commissions major works but evaluates institutional performance against project initiation and disbursement speed rather than long-term asset quality. Major contractors (Abdul Monem Ltd, DIRD Engineering) prioritise high-value reconstruction tenders because margins are predictable and contracts are large. National procurement law mandates the lowest compliant bid, excluding lifecycle cost from selection criteria; and donor financing from ADB, World Bank, and JICA flows almost entirely into capital expenditure. Assets are delivered with a systematic quality ceiling, with no contractual accountability for long-term performance.

The operation and maintenance market is functionally absent. Water Management Organisations (WMOs) — formally co-responsible for polder-level O&M — cannot access repair funds for minor defects. Resources are released only after catastrophic failure, creating a perverse 'Failure Reward' dynamic. There is lack of effective and functioning commercial market for routine maintenance services. O&M allocations stand at approximately 0.1% of GDP, of which 90 percent is consumed by emergency repairs which diminishes allocation for prevention. Rules do not mandate minimum O&M expenditure as a condition of project approval.

The asset management market is effectively absent. There is lack of GIS-linked national asset register, standardised condition scoring system, and automatic budget trigger when assets fall below minimum thresholds. Without reliable condition data, O&M budget requests cannot be substantiated, deterioration remains administratively invisible until it reaches crisis point, and the only institutional response available is emergency reconstruction. BWDB's 23 non-operational dredgers are emblematic of this failure: the fleet degrades without a maintenance programme while the sedimentation challenge grows with every delayed intervention.

The financing market structurally underpins all other failures. The Ministry of Finance, ERD, ECNEC, and donor agencies are incentivised toward capital expenditure; the Medium-Term Budget Framework does not ring-fence O&M allocations; and no automatic fiscal trigger responds to asset condition decline. The result is a self-reinforcing credibility trap: without an asset registry, O&M requests cannot be substantiated; without substantiated requests, allocations remain minimal; without adequate allocations, asset registries cannot be maintained.

These four market failures operate as a closed loop. The construction market delivers assets that deteriorate faster than the O&M market can sustain. The O&M market cannot be sustained without condition data that the asset management market does not produce. And the financing market allocates resources reactively, denying both the O&M and asset management markets what they require to function. The BNR cycle is the institutional expression of this systemic lock-in: reconstruction is the only commercially viable, institutionally rewarded, and fiscally accessible response to infrastructure failure.

These four market system failures manifest as six structural drivers, consistently confirmed across KII evidence:

The six structural drivers are: (1) a chronic O&M financing gap, with allocations at approximately 0.1% of GDP against the 0.5% set as a target in BDP2100 — the World Bank's CEIP-1 committed USD 375 million of capital investment with no structured O&M provision at approval stage; (2) livelihood–infrastructure conflict, where saline shrimp aquaculture incentivises embankment breaching and sluice operation is misaligned with crop calendars; (3) commercial and reconstruction market bias, with contractors optimising for high-margin rebuild packages while routine O&M contracts remain fragmented, low-margin and subject to payment delays beyond twelve months; (4) river morphology, sedimentation and dredging practice, where an annual sediment load of roughly 10 billion cubic metres outstrips volume-based episodic dredging and 23 BWDB dredgers stand non-operational; (5) the absence of asset-condition data behind O&M requests, which leaves deterioration administratively invisible and gives the Ministry of Finance grounds to withhold funding; and (6) inter-institutional coordination failure, with BWDB, LGED, DAE and BIWTA operating on shared physical infrastructure under independent planning cycles (54 of 75 sluice gates in Dumuria Upazila were non-operational). Full evidence for each driver appears in Section 3.3.2.

Together, these six drivers create what the Value-Loyalty-Loss (VLL) analysis describes as a consistent asymmetry: the rebuild phase generates career advancement, contractor revenue, political visibility, and easier financing flows for every stakeholder group, while prevention generates none. The cycle is stable not despite its

costs, but because its costs fall on infrastructure and communities while its rewards accrue to institutions. Critically, the costs of the BNR cycle — reduced flood protection, disrupted livelihoods, agricultural losses, waterlogging, and constrained climate adaptation — are largely invisible in the political economy of infrastructure. Bangladeshi citizens collectively bear this burden, yet it is diffuse, unquantified, and politically underrepresented. A targeted communication strategy — including a policy discussion paper and opinion articles in national and international media — could make these invisible costs visible and build the public mandate for reform.

4. Systemic Pains and Gains of the System

Building on the understanding the BNR and why BNR cycle persists, the study team applied a Value–Loyalty–Loss (VLL) framework to identify which actors gain from the current cycle and which bear its costs — and to understand the loyalties that sustain the equilibrium.

Across all KIIs, respondents from BWDB, MoWR, ERD, JICA, the World Bank, ADB, contractors, and local communities consistently described the same institutional logic: reconstruction is rewarded while prevention is not.

The VLL analysis reveals a consistent asymmetry across all stakeholder groups: the rebuild phase generates career advancement, contractor revenue, political visibility, and easier financing flows; while the prevention phase generates none of these. The cycle is stable not because of ignorance, but because it distributes rewards to those with institutional power and costs to those without it.

5. Strategic Recommendations

The study identifies six validated leverage points where focused institutional intervention can generate system-wide behavioural change. These are not isolated policy fixes — they are structural shifts designed to simultaneously realign incentives, financing rules, and coordination mechanisms across all four functional markets.

5.1. Vision for Change

The BNR cycle persists because the system consistently rewards reconstruction over prevention through financing structures, procurement rules, institutional incentives, and coordination failures. The vision for change is therefore not a technical solution, but a shift in the system's underlying institutional logic: one in which infrastructure durability becomes the most rational and most rewarded outcome for every actor in the system. Six systemic conditions must hold simultaneously for this transition to occur:

- Financing condition: No new project approval without a 10-year O&M commitment, embedding maintenance within all capital project approvals.
- Livelihood condition: Enforceable no-net-breach mechanisms and coordinated sluice operation with agricultural calendars to align infrastructure operation with local livelihoods.
- Market condition: Bundled, multi-year performance-based O&M contracts to replace fragmented, delayed, and reconstruction-biased contract structures.
- Morphology condition: Integrated river basin sediment management to address upstream siltation and reduce recurring hydraulic failure.
- Dredging condition: Routine dredging is an essential component of polder operation and maintenance (O&M), helping to prevent embankment and sluice gate failure. Replacing volume-based excavation targets with performance-based river functionality indicators.
- Coordination condition: A joint coastal infrastructure coordination mechanism to ensure BWDB, LGED, DAE, and BIWTA act within a unified hydraulic planning framework rather than fragmented mandates.

5.2 Operational Nudges to Address BNR

The operational nudges are organized into two categories: (1) Immediate and Practical Interventions, which can be actioned within existing BWDB administrative procedures without requiring legislative or inter-agency coordination; and (2) Medium-Term Institutional Reforms, which require broader policy coordination across ministries and financing institutions.

Immediate Interventions

- Integrate asset history and condition data into procurement and maintenance planning.
- Recognize preventive maintenance in staff performance assessment and strengthen staff capacity on asset management.

- Establish annual maintenance performance reporting using standardized asset indicators.

Medium-Term Institutional Reforms

- Link budget approvals and external financing requests to verified asset-condition assessments.
- Introduce mandatory post-failure audits for assets that fail prematurely after construction or rehabilitation.
- Establish a formal inter-agency coordination mechanism for planning and approving interventions affecting shared hydraulic infrastructure.

Evidence from KIIs also points to three other interventions:

- Pilot Systematic Maintenance Accounts at the polder level. WMO interviews across Polders 52/53(A) consistently identified ring-fenced local maintenance funds as a critical gap that prevents drift from routine maintenance into emergency response.
- Introduce outcomes-based disbursement for O&M financing. The World Bank's Program-for-Results (PforR) instrument — which conditions disbursement on verified performance outcomes — offers a proven model for aligning donor financing with O&M accountability.
- Establish strategic material depots and pre-monsoon vulnerability mapping. BWDB River Management Division evidence highlights that response time is the primary determinant of breach scale, and that pre-positioned materials and pre-monsoon mapping can prevent minor failures from escalating.

5.3 Validated Leverage Points

Six leverage points were validated through KII findings as sites where focused institutional change can generate system-wide behavioural shifts. Full detail on each leverage point appears in Section 4.2.

6. Co-Created Reform Roadmap

Chapter 5 presents the Phase 2 draft co-created reform roadmap, structured around the six leverage points across three implementation horizons (0–12 months, 12–36 months, and 36+ months). The roadmap includes a phased action matrix, a responsibility matrix identifying primary owners and RVO/PfW support roles, resistance and incentive strategies for each key actor group, a risk register, a monitoring framework with baseline and target indicators, and seven early actions that can be initiated immediately within BWDB's existing authority. The roadmap is submitted as a draft for validation at the August 2026 stakeholder workshop.

7. Identified Change Agents

The study assessed KII respondents against three behavioral indicators: energy beyond standard institutional job description; explicit structural curiosity about the future; and long-term willingness to stay operationally engaged. Six institutional positions were identified as well-positioned to champion and sustain the reform process.

8. Conclusion

The Build–Neglect–Rebuild cycle in Bangladesh's water sector is not primarily a technical failure, it is a stable institutional equilibrium. Every major actor in the system — BWDB divisions, contractors, financing agencies, political actors — earns more from reconstruction than from prevention.

Breaking this cycle requires simultaneous action across four domains: political incentives, ministry-level financing architecture, commercial market structure, and inter-agency coordination. The transition pathway is clear: from narrative budgeting toward verified asset data; from CAPEX-driven promotion paths toward performance-based career incentives; from fragmented sectoral mandates toward a joint coastal water infrastructure coordination mechanism; from reactive emergency reconstruction toward preventive asset management embedded in Bangladesh's national budget architecture. Chapter 5 of this report presents a draft co-created reform roadmap structured across three implementation horizons, covering a phased action matrix for all six leverage points, a responsibility matrix, resistance and incentive strategies, a risk register, a monitoring framework, and early actions that can be initiated immediately. This roadmap will be validated and finalized at the August 2026 stakeholder workshop.

The Netherlands Enterprise Agency plays an important role; not as a traditional funder, but as an institutional anchor. RVO's convening power across BWDB, MoWR, the Planning Commission, and the donor community positions it to broker the

institutional consensus that individual agencies cannot achieve alone.

This report fulfils the Phase 1 deliverable requirement under the ToR: a comprehensive system mapping report covering the four interconnected market systems, six structural drivers, and six validated leverage points. Phase 2 will translate these findings into a co-created reform roadmap, co-designed with BWDB and key stakeholders. A draft co-created reform roadmap is included in Chapter 5 of this report, covering a phased action matrix, responsibility assignments, risk register, monitoring framework, and early actions. This roadmap will be validated and finalized through the August 2026 stakeholder workshop, which will constitute the Phase 2 deliverable.

Glossary of Key Terms

The following terms are used throughout this report. Definitions are drawn from authoritative published sources in market systems development, institutional economics, asset management, and infrastructure governance. Where a term is applied in a specific analytical sense within this study, that usage is noted.

Market System

A market system comprises three interdependent elements: (1) a core function — the exchange of goods or services between buyers (demand side) and sellers (supply side); (2) supporting functions — services, infrastructure, and information that enable the exchange; and (3) rules — formal regulations and informal norms that govern how actors behave. Market systems are embedded in wider political, social, and physical environments that shape their performance and outcomes. *Source: Springfield Centre (2014). The Operational Guide for the Making Markets Work for the Poor (M4P) Approach, 2nd Edition. DFID / SDC. pp. 19–21.*

Market Systems Development (MSD)

An approach to economic development that seeks to achieve sustainable, systemic improvement in the functioning of markets for the benefit of poor or excluded people. MSD focuses on addressing the root causes of market failure — the rules and supporting functions that determine market behaviour — rather than substituting for market actors or delivering services directly. *Source: BEAM Exchange / Springfield Centre (2016). MSD Toolbox: A Practical Guide to Market Systems Development. DFID.*

Systemic Constraint

A constraint that arises from the structure of a market system — its governing rules, absent or dysfunctional supporting functions, or the incentive logic embedded in actor relationships — rather than from any single actor's individual capacity or willingness. Systemic constraints are self-reinforcing: they persist even when individual actors recognise the dysfunction, because no single actor has both the incentive and the authority to remove it unilaterally. *Source: Springfield Centre (2014). The Operational Guide for the Making Markets Work for the Poor (M4P) Approach, 2nd Edition. DFID / SDC. p. 28.*

Formal Rules

Written and codified laws, regulations, property rights, contracts, and constitutions that structure human interaction and are enforced by the state or by designated regulatory authorities. In the context of market systems, formal rules include procurement regulations, budget codes, licensing requirements, and sector-specific legislation. *Source: North, D.C. (1990). Institutions, Institutional Change and Economic Performance. Cambridge: Cambridge University Press. pp. 36–47.*

Informal Norms

Unwritten codes of conduct, conventions, social norms, traditions, and self-imposed behavioural constraints that govern human interaction outside formal legal frameworks. Informal norms often coexist with — and in contexts of weak formal enforcement regularly override — formal rules. They change slowly and are transmitted through socialisation, professional culture, and repeated interaction. *Source: North, D.C. (1990). Institutions, Institutional Change and Economic Performance. Cambridge: Cambridge University Press. pp. 36–45.*

Supporting Functions

Services, infrastructure, information flows, training, research, and other inputs that enable market systems to function but are not themselves part of the core exchange transaction. Examples include financial services, technical standards, data systems, and transport infrastructure. Absent or dysfunctional supporting functions are a primary source of systemic market failure. *Source: Springfield Centre (2014). The Operational Guide for the Making Markets Work for the Poor (M4P) Approach, 2nd Edition. DFID / SDC. p. 21.*

Leverage Point

A place within a system where a small, well-targeted intervention can produce large and lasting change in system behaviour. Leverage points include places where information flows can be improved, feedback loops can be strengthened or weakened, and the goals, rules, or paradigms that give rise to system structure can be shifted. Higher-order leverage points — changing goals, rules, and paradigms — tend to produce more durable change than lower-order parameter adjustments. *Source: Meadows, D. (1999). Leverage Points: Places to Intervene in a System. Hartland, VT: The Sustainability Institute. pp. 1–19.*

Build-Neglect-Rebuild (BNR) Cycle

A recurring institutional pattern in infrastructure sectors in which capital investment creates new or rehabilitated assets that are subsequently undermined by systematic under-investment in operation and maintenance, leading to accelerated deterioration, eventual emergency reconstruction, and repetition of the cycle. The BNR cycle is not primarily a technical failure: it is a stable institutional equilibrium in which prevailing incentive structures, financing rules, and career logic consistently reward reconstruction over prevention for all major actors. *Source: As applied in this study. For analogous frameworks see: World Bank (2023). Infrastructure Asset Management in Lower- and Middle-Income Countries. Washington, DC: World Bank; and Briceno-Garmendia, C. & Foster, V. (2010). Africa's Infrastructure: A Time for Transformation. Washington, DC: World Bank.*

Asset Management

The coordinated and systematic set of activities through which an organisation realises value from its assets over their full lifecycle — from acquisition and commissioning through operation, maintenance, and eventual decommissioning or disposal. Effective asset management requires explicit balancing of cost, risk, and performance across the lifecycle, supported by reliable condition data and integrated planning systems. *Source: International Organization for Standardization (2014). ISO 55000: Asset Management — Overview, Principles and Terminology. Geneva: ISO. p. 2.*

Lifecycle Cost

The total cost of owning and operating an asset from initial acquisition through the end of its useful life, including capital expenditure, installation, commissioning, operation, routine and periodic maintenance, repair, and final disposal or replacement. Lifecycle costing reveals the long-term fiscal consequences of deferred maintenance and provides a more complete basis for investment decisions than upfront capital cost alone. *Source: ISO 55000 (2014). Asset Management — Overview, Principles and Terminology. Geneva: ISO. See also: HM Treasury (2022). The Green Book: Central Government Guidance on Appraisal and Evaluation. London: HM Treasury.*

Operation and Maintenance (O&M)

The ongoing activities required to keep an infrastructure asset functioning at an acceptable and safe level of service, encompassing routine inspection, preventive maintenance, minor repairs, operational management, and periodic rehabilitation. In the water infrastructure sector, O&M includes embankment patrolling, sluice gate operation, drainage management, and sediment clearance. Adequate O&M is essential to preserving an asset's design life and hydraulic performance. *Source: Asian Development Bank (2015). Guidelines for Operation and Maintenance of Irrigation and Drainage Schemes. Manila: ADB. See also: World Bank (2018). Operation and Maintenance of Irrigation and Drainage Systems: A Best Practices Manual. Washington, DC: World Bank.*

Performance-Based Contracting (PBC)

A procurement and contract management modality in which payments to service providers are linked to the achievement of pre-specified output or outcome indicators — such as asset condition scores, channel depth, or sluice gate operability — rather than to inputs consumed or activities completed. PBC shifts financial risk and operational management responsibility to the contractor, creating incentives for quality-focused, outcome-oriented service delivery. *Source: World*

Bank / PPIAF (2016). Performance-Based Contracts for Road Rehabilitation and Maintenance. Washington, DC: World Bank. See also: Asian Development Bank (2015). Performance-Based Contracting for Maintenance of Road Assets. Manila: ADB.

Value-Loyalty-Loss (VLL) Framework

An analytical framework applied in this study to map the political economy of institutional change. For each key actor group, the VLL framework asks: (1) What value does the actor derive from the current system — what do they gain? (2) What loyalties — institutional, professional, political, or social — sustain their current behaviour? (3) What losses does the actor fear from reform? The framework helps identify which actors are most likely to resist or support change, and what incentive adjustments or risk mitigations might shift their behaviour. *Source: Adapted from: Sayer, J. & Margoluis, R. (2011). Political Economy Analysis for Practitioners. USAID. See also: Booth, D. & Unsworth, S. (2014). Politically Smart, Locally Led Development. ODI Discussion Paper. London: Overseas Development Institute.*

Polder

A low-lying area of land enclosed and protected from flooding by a continuous ring of earthen embankments (dikes or bunds), with water levels managed through sluice gates, pumps, and drainage canals. In Bangladesh's coastal delta, polders are the primary form of flood and salinity protection infrastructure, collectively protecting more than 20 million people and extensive agricultural and aquaculture land from tidal inundation and cyclone surge. *Source: Bangladesh Water Development Board (2020). Coastal Embankment Improvement Project Phase 1 (CEIP-1): Project Completion Report. Dhaka: BWDB. See also: Kolen, B. et al. (2013). Flood Risk and Water Management in the Netherlands. Delft: Deltares.*

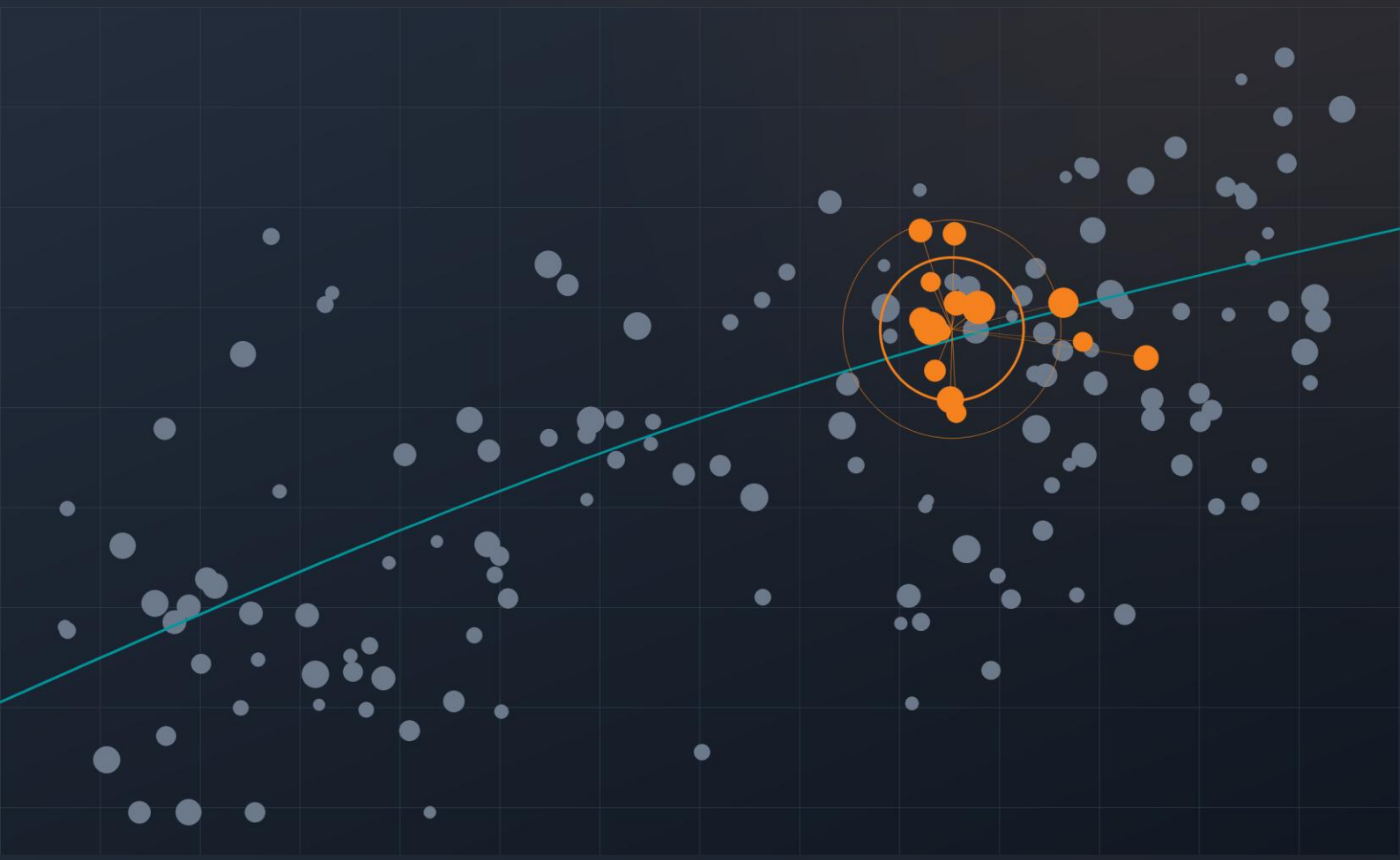
Process-Driven Organisation

An organisation in which planning, budgeting, procurement, implementation, monitoring, and accountability are governed by standardized, documented, and continuously monitored procedures that apply consistently across all activities — rather than being determined ad hoc by individual project managers, donor requirements, or short-term budget cycles. A process-driven organisation maintains institutional memory, generates comparable performance data, and holds staff accountable against procedural and outcome standards rather than against project disbursement milestones. *Source: Hammer, M. & Champy, J. (1993). Reengineering the Corporation: A Manifesto for Business Revolution. New York: HarperBusiness. See also: ISO 9001 (2015). Quality Management Systems — Requirements. Geneva: ISO; and OECD (2017). Systems Approaches to Public Sector Challenges: Working with Change. Paris: OECD Publishing.*

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01

Introduction

Background, objectives and scope of the Phase 1 systems mapping.

01 Introduction

1.1 Background of the Study

This study is one of a set of complementary assignments commissioned by the Netherlands Enterprise Agency (RVO) under the Partners for Water (PfW) Programme, building directly on the Asset Management Maturity Scan conducted by Dr. Hala Alhamed, which assessed BWDB's organizational and technical readiness for lifecycle-based asset management. Where Dr. Hala's assignment established the institutional baseline, this study maps the broader systemic landscape sustaining the Build–Neglect–Rebuild (BNR) cycle and identifies the structural leverage points for transitioning BWDB toward process-driven management; together forming the analytical foundation for the PfW reform roadmap in Bangladesh. Carried out by Innovision Consulting Private Limited, the study contributes to the Bangladesh Delta Plan 2100 (BDP2100) and is aligned with the national water sector priorities of the Government of Bangladesh (GoB) and the Bangladesh Water Development Board (BWDB).

Bangladesh's water infrastructure system, including coastal polders, flood embankments, and regulators, is vital for climate resilience, food security, and economic stability. The country's polder system — one of the world's largest and most complex — protects more than 20 million people across the coastal delta. A 1 percent reduction in flood risk translates to an estimated USD 1.6 billion reduction in expected annual damages. Yet despite enormous capital investments, the sector has consistently failed to sustain infrastructure over time. The result is a self-perpetuating Build–Neglect–Rebuild (BNR) cycle: infrastructure is built, left without adequate maintenance, deteriorates, and is eventually rebuilt at substantial public cost.

To protect these investments and achieve the goals of BDP2100, the sector needs a shift from a build-and-leave approach to lifecycle asset management; treating maintenance not as a residual activity, but as a core function of infrastructure governance. This imperative is not new: BDP2100 itself explicitly flagged that O&M spending must increase from its current level of approximately 0.1% of GDP to 0.5% of GDP, a fivefold increase that has yet to be reflected in actual budget allocations more than a decade after the plan's adoption. BDP2100 had already flagged this gap explicitly: current O&M allocations stand at approximately 0.1% of GDP against a BDP2100 target of 0.5% of GDP — a fivefold increase that the sector must achieve to secure the long-term viability of its infrastructure investments.

1.2 Objectives of the Study

The study aims to enable the Bangladesh Water Development Board (BWDB) to transition from a project-driven organization to a process-driven organization. The table below presents the goals and objectives of the study.

Table 1: Goals and objectives of the study

Goal	Objective(s)
Enable BWDB to transition from a project-driven to a process-driven organization – where planning, budgeting, procurement, implementation, O&M, and accountability are governed by standardized, data-informed, and continuously monitored procedures rather than by the	• Conduct a comprehensive systems mapping of BWDB's institutional arrangements, financial structures, and market dynamics to identify the root causes of the BNR cycle.
	• Identify individual and institutional champions and opportunities for systems change.
	• Facilitate stakeholder alignment and consensus on the need for a process-driven approach to polder management.
	• Co-create an actionable roadmap outlining priority actions, sequencing, roles, and responsibilities for transitioning to a process-driven model - covering planning, budgeting, procurement, implementation, O&M, and accountability frameworks.

ad hoc logic of individual project cycles	• Support early action initiatives to demonstrate feasibility and build momentum for the transition including data-informed maintenance budgeting and performance-based procurement as first-mover interventions.
	• Recommend institutional capacity development measures to embed systemic practices within BWDB and relevant government agencies, including standardized asset condition monitoring, O&M performance metrics, and inter-agency accountability mechanisms.

1.3 Scope of this Report

The study has two phases. Phase 1 focuses on system mapping of relevant polder-level water sector markets to identify the root causes and structural drivers of the BNR cycle, and Phase 2 focuses on co-creating a reform roadmap for BWDB's transition to a process-driven organization. This report constitutes the consolidated Phase 1 output. It also presents, in Chapter 5, a draft Co-Created Reform Roadmap prepared ahead of the Phase 2 validation workshop; this roadmap is preliminary and will be finalised, and issued as the separate Phase 2 report, following that workshop.

This report aims to identify the core factors triggering the BNR cycle in water management in Bangladesh. **While polder management serves as the primary case, the findings on institutional incentives, financing structures, procurement, and governance fragmentation are generic to BWDB's broader organizational challenge.** It draws on stakeholder consultations, document reviews, and field-level evidence, using the Market Systems Development (MSD) framework as its analytical foundation.

The findings are further intended to inform the wider Partners for Water (PfW) support portfolio in Bangladesh, the various capacity-building, contracting, and institutional pilot initiatives operating alongside this assignment; each of which should draw on, and where necessary adjust their approaches in light of, the systemic barriers, incentive structures, resistance factors, and change agents identified here.

The four PfW initiatives specifically implicated are: (1) the Asset Management Roadmap led by Dr. Hala Alhamed, which should use the leverage points and resistance factors identified in this report to prioritise its sequencing; (2) the WWA capacity-building programme, which should embed in its training module the systemic incentive framing presented in this report; (3) the performance-based contracting pilots, which should be designed to directly counter the volume-based procurement norms identified as a root cause; and (4) the institutional and coordination model for Polder 31, which should test the inter-institutional governance mechanisms proposed in Leverage Point 6.



02

Methodology

Research framework, stakeholder mapping and data analysis approach.

02 Methodology

The methodology is designed to support BWDB's transition from a project-driven to a process-driven organization **by looking beyond BWDB's internal arrangements to examine the wider system, the institutional, financial, commercial, and governance actors and incentive structures that collectively sustain the BNR cycle**. It includes a review of relevant documents, stakeholder mapping, primary data collection through KIIs, and a systemic data analysis using the Market Systems Development (MSD) framework.

2.1 Research Question(s)

To address the objectives of the study, Innovision developed four core research questions. Table 2 presents the core research questions.

Table 2: Core research questions

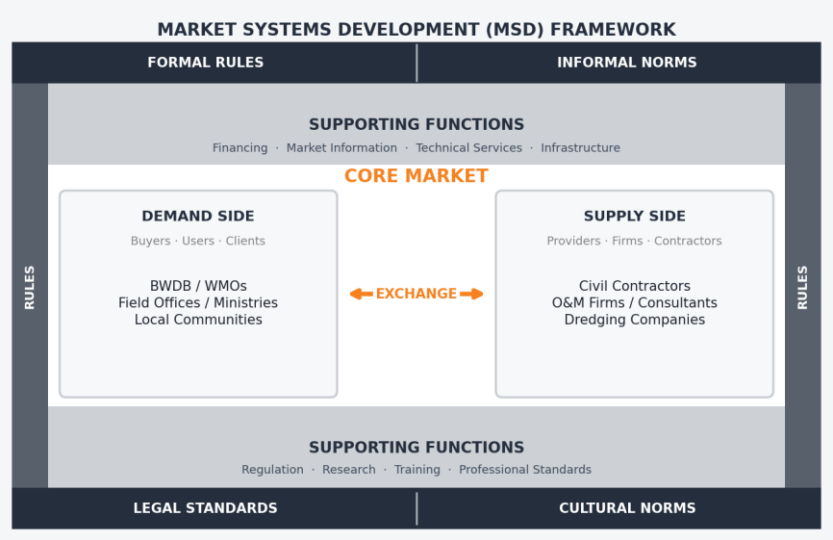
Theme	Research Questions
Systemic Drivers of the BNR Cycle	What formal and informal institutional arrangements and stakeholder relationships reinforce the project-centric BNR cycle within polder-level water management in Bangladesh?
Pathways for Systemic Change	What are the structural entry points and policy windows in the current system that could be leveraged to effectively shift institutional incentives, capacities, and behaviours toward sustainable, process-driven polder management?
Building a Process-Driven Consensus	What institutional roles and coordination strategies are required to build broad-based consensus among key stakeholders for a process-driven approach to sustainable polder management?

2.2 Overarching Framework for System Mapping

To address the research questions and thereby achieve the study objectives, the study adopts the Market Systems Development (MSD) framework as its overarching analytical tool. The MSD framework enables a structured analysis of each functional market through three layers: the core market (actors on the demand and supply side), supporting functions (services, information, and financing that enable market activity), and the governing rules (formal regulations and informal norms that shape market behaviour).

Figure 1 presents the MSD framework, which provides a systematic basis for identifying the constraints and dynamics that prevent markets from sustainably serving all actors.

Figure 1: Market systems development (MSD) framework



Source: Springfield Centre / BEAM Exchange, Making Markets Work for the Poor (M4P) Operational Guide. The three-layer framework — Core Market, Supporting Functions, and Rules — forms the analytical backbone of this study.

2.3 Review of Relevant Documents

The study began with a review of documents relevant to Bangladesh's water sector. Strategic and legal documents identified key policy priorities, financing rules, and institutional mandates. Table 3 presents the key documents reviewed and their core focus in the analysis.

Table 3: Key water sector documents reviewed

Document Name	Document Type	Core Focus in Analysis
National Water Policy (1999) National Water Management Plan (2001)	National Strategy	Looked at high-level goals for infrastructure sustainability and maintenance.
Bangladesh Delta Plan 2100 (BDP2100)	Macro-Resilience Plan	Analyzed long-term climate strategies and the actual funding targets required for sustainable infrastructure management.
BWDB Act (2000)	Legal Mandate	Discussed the legal responsibilities, identity, and bureaucratic boundaries of the organization.
Guidelines for Participatory Water Management (GPWM)	Community Framework	Explained the rules on local community engagement and the delegation of local infrastructure responsibility.
Dr. Hala's Maturity Scan (Report on Institutionalization of Asset Management of BWDB)	Asset Management System Analysis	Measured the agency's current baseline capability regarding data infrastructure and managerial systems.
Establish a Shared Agenda for Addressing the "Build, Neglect, and Rebuild" Cycle (BNR)	Root Cause Analysis	Evaluated the core bottlenecks holding back funding, emergency responses, and sector-wide coordination.

2.4 Stakeholder Mapping

Based on the review of relevant documents, the study team conducted a stakeholder mapping exercise to identify the key stakeholders involved in polder-level water management.

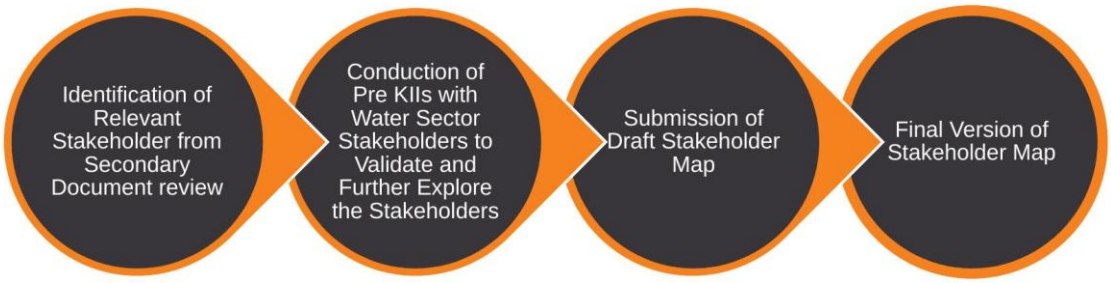
The stakeholder mapping process included the following activities:

- Identification of stakeholders involved in planning, implementation, operation, maintenance, financing, regulation, and oversight of polder-level water infrastructure.

- Review and validation of stakeholder roles, relationships, and institutional linkages identified through secondary document review.
- Conducting 4 pre-key informant interviews (KIIs) with selected sectoral stakeholders, including: Research Officer of Bangladesh Water Development Board (BWDB); Director and Professor at Institute of Water and Flood Management (IWFM), Bangladesh University of Engineering and Technology (BUET); Program Officer of JICA Wing at BWDB; Upazila Engineer (Batiaghata), Local Government Engineering Department (LGED).
- Validation and refinement of the stakeholder map based on insights gathered from the pre-KIIs and document review.

These activities helped the study team better understand stakeholder relationships, institutional dynamics, and sectoral interdependencies, thereby ensuring a comprehensive and grounded stakeholder map.

Figure 2: Process of finalizing the stakeholder map



The four-stage stakeholder mapping process from secondary review through validation.

2.5 Primary Assessment

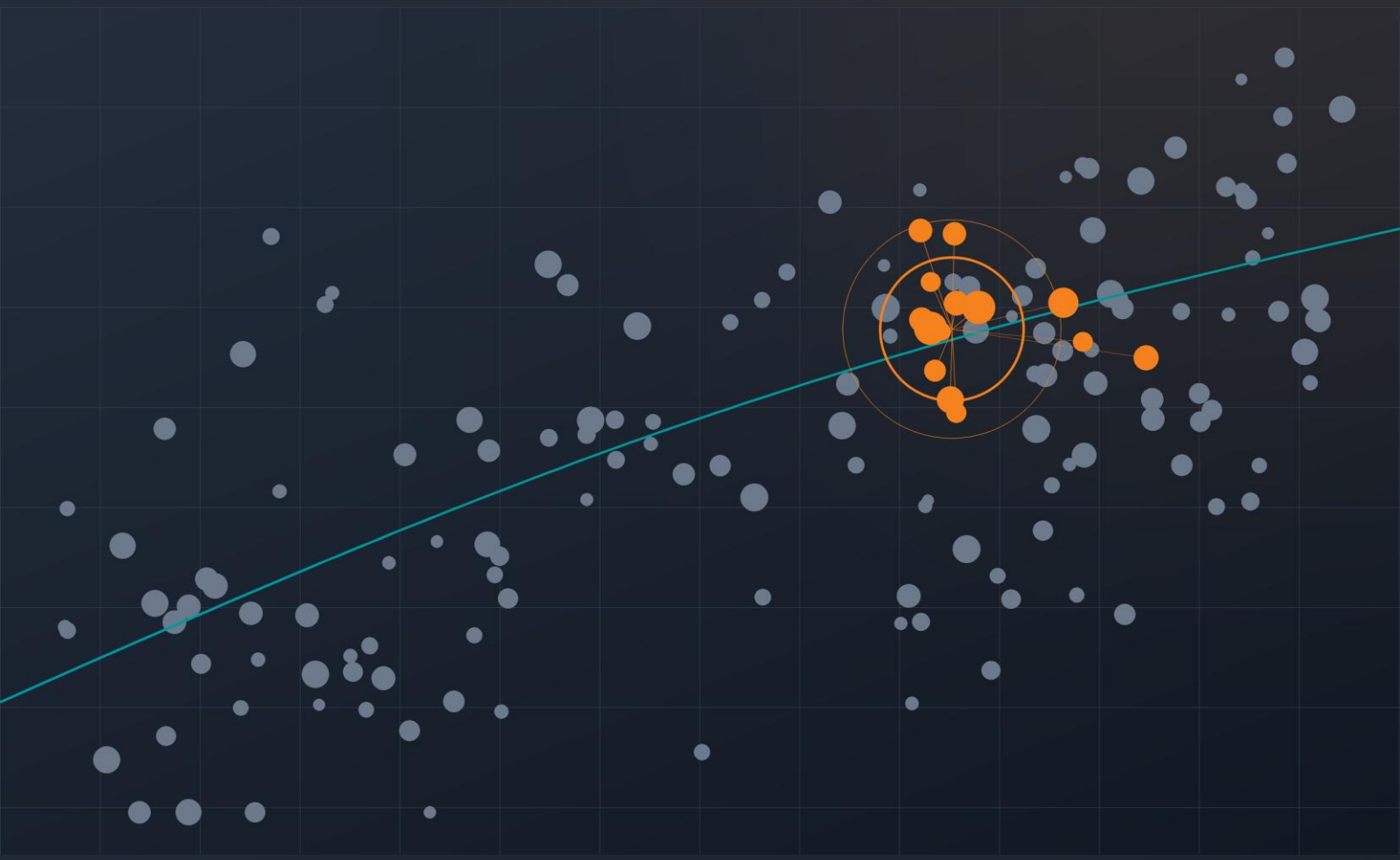
Following the finalization of the stakeholder mapping, the study team conducted Key Informant Interviews (KIIs) with stakeholders identified as core demand-side actors, supply-side actors, support service providers, or rule-setters across the four functional market areas.

The stakeholder mapping categorized actors into both the supply side and demand side and identified the support services and market rules that govern each functional market. The primary assessment covered 38 KIIs across seven stakeholder categories.

2.6 Data Analysis

Using findings from the primary assessment, validated through stakeholder consultations and secondary evidence, the study team analysed the data against four key analytical tasks:

- Understanding the Build–Neglect–Rebuild (BNR) cycle and how it operates
- Identifying why the BNR cycle persists in polder-level water management
- Examining the key factors triggering the BNR cycle
- Identifying potential pathways and strategic measures to mitigate the BNR cycle



03

Analysis of Findings

Market system failures, structural drivers and systemic pains and gains.

03 Analysis of Findings

Applying the Market Systems Development (MSD) framework as its analytical lens, this section builds on the consolidated findings from the document review (Section 3.1) and primary assessment (Section 3.2) to map the root causes and structural drivers of the BNR cycle in Bangladesh's coastal polder system.

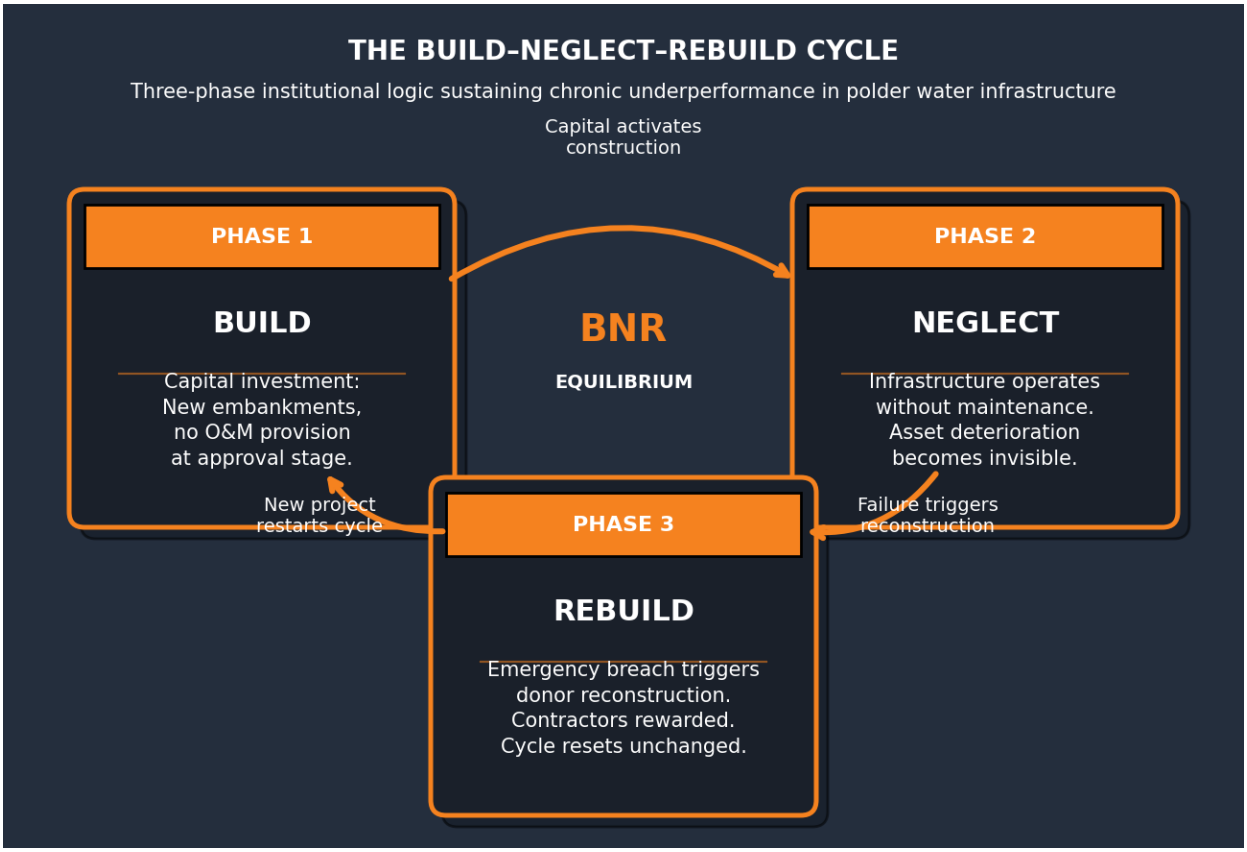
3.1 Findings from Review of Relevant Documents

The study team has started with defining the core terms of the study: Build-Neglect-Rebuild (BNR), and Polder.

Build-Neglect-Rebuild (BNR): The build-neglect-rebuild cycle is a costly and counterproductive pattern in infrastructure management where new infrastructure is built but not adequately maintained, leading to neglect and deterioration, which then requires expensive rebuilding or rehabilitation.

Polder: A polder system is a low-lying tract of land that has been reclaimed from a body of water, such as a sea, lake, or river, by constructing embankments, known as dykes or levees, and drainage systems to manage water levels.

Figure 3: The Build–Neglect–Rebuild cycle — three-phase institutional logic



The BNR cycle operates across three compounding phases: BUILD (capital investment, no O&M provision), NEGLECT (operational deterioration, absent maintenance market), and REBUILD (emergency reconstruction, restoring the loop).

3.1.1 Core findings from the Document Review

Reviewing the documents as an interconnected institutional landscape showed a gap between national strategic ambitions and the operational financing reality. The gap indicates a structural obstacle to sustainable infrastructure management.

Policy frameworks such as the National Water Policy (1999) and the Bangladesh Delta Plan 2100 emphasize long-term lifecycle management and integrated water governance. However, the operational

reality — shaped by BWDB's legal mandate, procurement rules, and budget structures — continues to prioritize construction over maintenance.

Institutional incentives further reinforce this model:

- Promotions and organizational prestige are tied to delivering new projects.
- Routine maintenance and asset preservation receive comparatively low priority.

Combining these findings with Dr. Hala's Asset Management Maturity Scan Report helped identify the specific barriers to sustaining water infrastructure. The scan showed that:

- Basic data systems and spatial modeling capacities already exist.
- However, they remain at only Basic to Core levels of readiness and are often underutilized.

The Maturity Scan also showed field offices are heavily burdened by managing new construction projects, resulting in:

- Poorly updated asset registries.
- Limited use of technical data for maintenance planning and budget justification.

The document review revealed a key limitation: secondary sources do not fully capture informal processes such as routine maintenance practices, local political dynamics, or the day-to-day operational challenges facing field engineers — gaps that the KIIs directly addressed.

3.1.2 Research Questions Addressed by the review of relevant document

RQ 1 (Systemic Drivers of the BNR Cycle): The literature proved that the BNR cycle is structurally reinforced. The formal policy framework mandates lifecycle management, but the operational rules — procurement law, budget classification, and performance metrics — structurally incentivize construction over maintenance.

RQ 2 (Pathways for Systemic Change): The review also identified clear strategic policy windows within the Delta Plan 2100 and emerging donor financing frameworks where lifecycle financing and O&M commitments could be embedded as conditionalities for project approval.

RQ 3 (Building a Process-Driven Consensus): The document review highlighted that durable institutional change in BWDB requires more than policy revision — it demands a shift in institutional culture and individual incentives, validated in the subsequent primary assessment.

3.2 Findings from the Primary Assessment

The primary assessment applies the Market Systems Development (MSD) framework as an analytical tool to identify why the BNR cycle persists and what systemic changes are needed to address it.

3.2.1 Stakeholder Mapping

As the first step, the study team identified four functional market areas operating within the polder-level water management system: infrastructure construction, operation and maintenance, asset management, and financing. These four functional markets were selected because they constitute the minimum necessary set of market systems through which the BNR cycle is sustained.

The M4P Operational Guide (Springfield Centre, 2015) defines an interconnected market as 'a market system which, as well as exchanging the core good or service, connects multiple market systems within an economy'. In the Bangladesh polder context, this definition captures a specific systemic logic: each of the four functional markets depends on the outputs of the others, and the failure of any one market amplifies failures in the others.

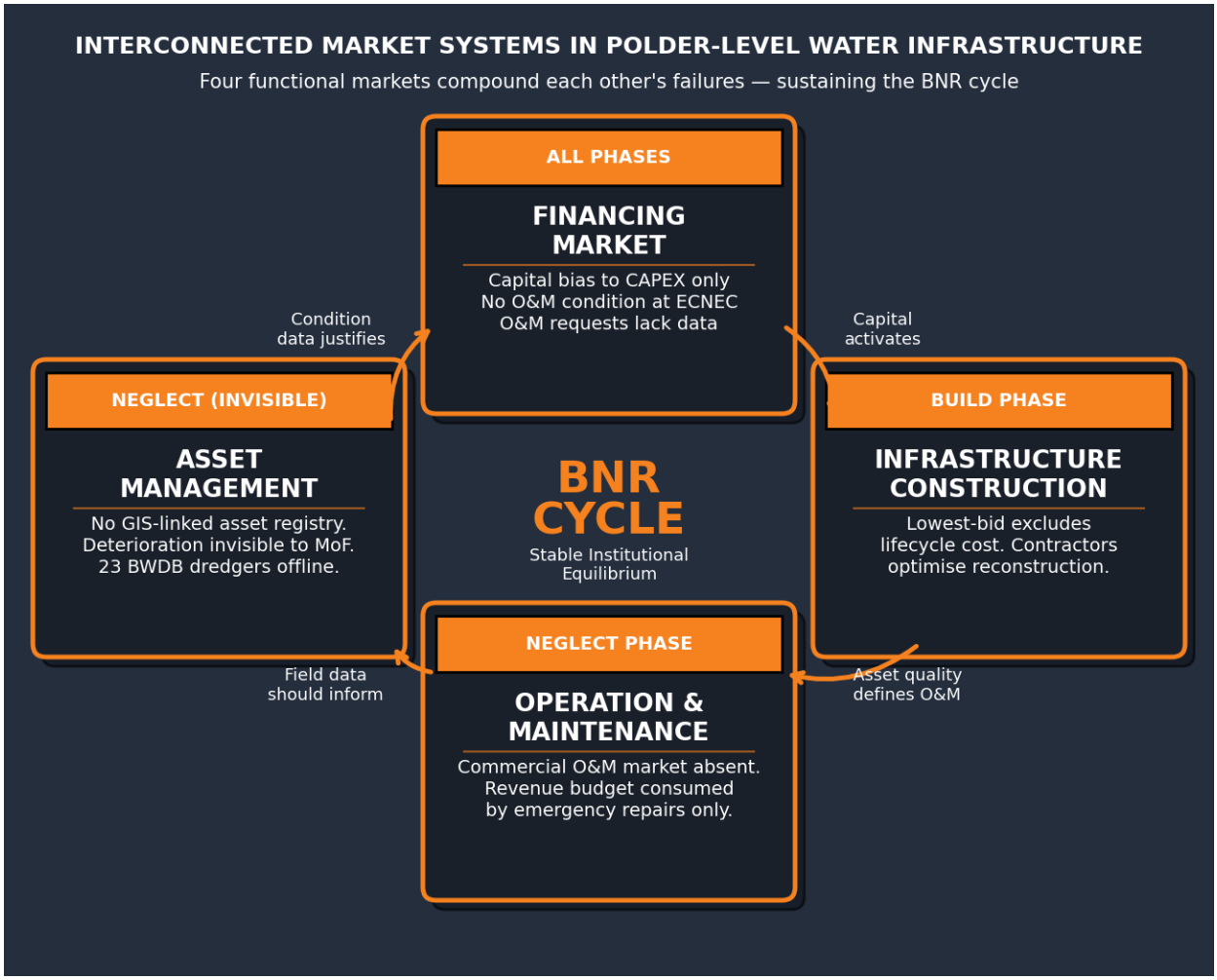
The specific interconnections in Bangladesh's water sector are as follows. The financing market provides the foundational resource flows that determine whether construction, O&M, and asset management activities can occur. The infrastructure construction market determines asset quality and the durability conditions under which O&M and asset management must subsequently operate. The O&M market's performance — or failure — directly determines the rate of asset deterioration and the frequency of reconstruction triggers. The asset management market supplies the condition data that should inform both

O&M prioritisation and financing decisions — but in Bangladesh, it is structurally unable to perform this function.

This interconnected structure is what makes the BNR cycle analytically distinct from a single-market failure. If only the O&M market were dysfunctional, targeted financing reform might suffice. But because all four markets fail in compounding and self-reinforcing ways, effective reform requires simultaneous intervention across all four.

Figure 4 presents the full stakeholder mapping across all four functional markets. For each market, it identifies the specific demand-side actors, supply-side actors, support functions, and governing rules. Full details of the market system mapping including individual market detail appear in Section 3.2.2.

Figure 4: Interconnected market systems in polder-level water infrastructure



The four functional markets — Financing, Infrastructure Construction, O&M, and Asset Management — form a closed loop. Each market failure amplifies the others, sustaining the BNR cycle as a stable institutional equilibrium.

3.2.2 Market Interdependency

Across the four functional markets, the analysis reveals how control, information, and accountability are distributed — and where the system breaks down.

- **In the Finance market, MoF and the Planning Commission control budget allocation.** Without verified asset-condition data, O&M requests cannot be substantiated within existing approval structures. ECNEC approves development projects without a committed maintenance plan. Development partners structure financing around capital disbursement. The result is a financing system that is structurally configured to fund construction and structurally unable to fund prevention.

- **In the Asset Management market, BWDB's central offices control information — but the information does not exist in usable form.** Without a GIS-linked asset registry, field-level deterioration is never recorded, never aggregated, and never reaches the decision-makers with authority to act on it. The market that should generate the evidence base for the entire system operates in a data vacuum.
- **In the Infrastructure market, contractors and engineering consultants control implementation.** Procurement frameworks reward reconstruction volume and lowest upfront cost over lifecycle performance. Consultants earn more from larger rehabilitation portfolios. Contractors prefer reconstruction packages. The market is commercially rational — and commercially oriented toward rebuilding rather than maintaining.
- **In the O&M market, accountability is most visibly absent.** BWDB field offices and WMCs are nominally responsible for routine maintenance, but without budget, without condition data from the Asset Management market, and without commercially viable contracts to engage the private sector, the O&M market is effectively non-functional. It activates only in emergency — which is precisely the condition the BNR cycle requires to complete itself.

Key informant interview

"Contractors are not failing the system; they are successfully following the perverse economic incentives that favor project turnover over asset durability."

— Tier-1 contractor, key informant interview

3.2.3 Detailed Market System Mapping

This section presents a detailed mapping of the four functional market areas — infrastructure construction, operation and maintenance, asset management, and financing — using the MSD framework. The Table 4 shows that each functional market is structured around a consistent system logic of demand, supply, supporting functions, and governing rules.

Table 4: Market system mapping of the water sector

Market System	Demand-Side Actors & Roles	Supply-Side Actors & Roles	Support Functions & Status	Governing Rules (Formal & Informal)
Infrastructure Construction Market Delivers major embankment, sluice gate, drainage works BNR Phase: BUILD	BWDB — primary commissioner; institutional performance measured by project initiation and disbursement speed rather than long-term asset quality or durability.	Tier-1 contractors: Abdul Monem Ltd, Toma Construction, DIRD Engineering Ltd, Dockyard (DEW). Optimise for large reconstruction tenders; O&M margin too low.	ADB, World Bank, JICA — capital financing; no O&M provisions attached to project loans. Consultants paid percentage of construction cost.	PPR 2008: lowest compliant bidder mandated; lifecycle cost excluded. ECNEC: no O&M provision required at project approval.
Operation & Maintenance (O&M) Market BNR Phase: NEGLECT	BWDB field offices — formally responsible for O&M; revenue budget constrained to emergency response. WMOs — co-responsible but without repair funding for minor defects.	Local contractors — fragmented, low-margin; payment delays exceed 12 months; commercial O&M market effectively absent.	LGED SAMP (Systematic Asset Management Programme) — road-sector model; applicable principles not transferred to water. No asset information system.	Revenue budget codes: no O&M ring-fencing; funds absorbed by emergency repairs. No performance metrics for preventive maintenance.
Asset Management Market BNR Phase: NEGLECT (invisible)	BWDB central and regional offices — logical data consumers; no institutional mechanism compels use of condition data for budget requests. Demand arises only after visible failure.	DDC and development consulting firms — produce episodic, project-bound condition assessments. Design data held as proprietary by consultants.	BWDB GIS unit — basic capability; largely underutilised. CEGIS — spatial and hydrological data systems; not linked to O&M planning cycles. 23 BWDB dredgers non-operational.	No mandatory condition assessment required before project approval. No statute mandates that condition data informs budget allocation.
Financing Market BNR Phase: ALL PHASES	BWDB, LGED, DAE — formally request O&M budget; trapped in a credibility trap: no asset data means requests cannot be substantiated; systematically deprioritised by MoF.	Ministry of Finance — ADP (capital) and revenue (recurrent) budget allocation; structurally biased toward CAPEX. ERD, ECNEC, donors — approve projects without O&M provisions.	MTBF — does not ring-fence O&M allocations; recurrent budget absorbs emergency repairs. No performance-linked O&M disbursement mechanism in use.	ADP vs revenue budget structure: capital and recurrent budgets structurally separated. ECNEC: construction plans required; O&M financing plans are not.

How Each Market System Drives the BNR Cycle: An Analytical Account

The four markets mapped in Table 4 do not operate independently. Their combined effect — each reinforcing the others — produces and sustains the BNR cycle as a stable institutional equilibrium.

Field photo — livelihood and infrastructure context



Farmer at irrigation canal, Batiaghata Upazila, Khulna. The livelihood–infrastructure conflict: sluice mismanagement disrupts crop calendars while saline aquaculture incentivises embankment breaching.

Infrastructure Construction Market: The Build Phase Sets the Conditions for Neglect

> *"Contractors are not failing the system; they are successfully following the perverse economic incentives that favor project turnover over asset durability."*
>
> **— Tier-1 Contractor, Key Informant Interview**

Operation & Maintenance Market: The Neglect Phase is Structurally Inevitable

> *"I can mobilise 100 men to plug a breach in one night, but I cannot get BWDB to release a bucket of grease for a sluice gate hinge. The system is designed to respond to crisis, not to prevent it."*
>
> **— Water Management Organisation representative, Key Informant Interview**

Asset Management Market: Deterioration Becomes Administratively Invisible

> *"BWDB cannot prove where the money goes. The Ministry of Finance uses this absence of data to justify continued underfunding of O&M."*
>
> **— BWDB Senior Official, Key Informant Interview**

Financing Market: Structural Underfunding Locks in the BNR Cycle

> *"The cost of building a structure is 1; the cost of losing it to neglect is 25. We cannot afford to keep building; we must start governing."*
>
> **— World Bank Sector Lead, Bangladesh, Key Informant Interview**

Table 5: Market system failure summary — four markets, four failure modes

Market System	Demand Failure	Supply Incentive	Key Support Gap	Formal/Informal Rules and Norms
Infrastructure Construction Market BNR Phase: BUILD	BWDB rewards project initiation milestones, not asset durability.	Contractors optimise for large reconstruction tenders. O&M: fragmented, low-margin;	Donors (ADB, WB, JICA) direct financing to CAPEX only.	PPR 2008: lowest compliant bidder (lifecycle cost excluded). ECNEC:

Market System	Demand Failure	Supply Incentive	Key Support Gap	Formal/Informal Rules and Norms
		payment delays >12 months.	Consultants paid % of construction cost.	no O&M provision required.
Operation & Maintenance Market BNR Phase: NEGLECT	Field offices cannot act without central approval (often >1 year). WMOs functionally unable to access repair funds.	No functioning O&M supply market. Routine contracts uneconomic for contractors.	No asset information system; GIS data not used for decisions.	Existing rules do not mandate a minimum O&M budget — leaving maintenance spending discretionary and consistently deprioritized. WMCs exist only during donor projects and dissolve once funding ends.
Asset Management Market BNR Phase: NEGLECT (invisible)	No mechanism compels BWDB to act on condition data. Demand arises only after visible failure.	Assessments are episodic and project-bound. Design data held as proprietary by consultants.	No GIS-linked national asset registry. No standardised condition scoring. 23 of BWDB's dredgers non-operational.	No statute mandates condition data inform budget allocation.
Financing Market BNR Phase: ALL PHASES	O&M requests lack data backing — systematically deprioritised by MoF.	MoF, ERD, ECNEC, donors structurally biased to CAPEX. USD 375M WB CEIP-1: no O&M provision.	MTBF does not ring-fence O&M. No automatic fiscal trigger for asset deterioration.	The revenue budget (which funds O&M) and the ADP (which funds capital construction) are structurally disconnected, not coordinated.

Key informant interview

"BWDB cannot prove where the money goes. The Ministry of Finance uses this absence of data to justify continued underfunding of O&M."

— BWDB senior official, key informant interview

3.3 Primary Evidence and Bridge to Systemic Analysis

Section 3.2 established that the BNR cycle is sustained by four interconnected market system failures — in infrastructure construction, operation and maintenance, asset management, and financing. This section moves from analytical mapping to field evidence. Section 3.3.1 documents the BNR cycle as it manifests in practice in Bangladesh's coastal polders. Section 3.3.2 presents the six structural drivers that express these market failures in operational terms, with direct KII evidence for each.

Three types of evidence are used in this section and are distinguished throughout: (i) **directly observed evidence** from the field visit to Dacope and Batiaghata Upazilas, presented as field documentation; (ii) **stakeholder-reported perceptions** from Key Informant Interviews (KIIs), presented as KII statements attributed to the respondent's role; and (iii) the study team's **analytical interpretation**, where individual observations and statements are aggregated into the structural drivers and systemic patterns presented below. The coastal polder 31 (current) (Dacope and Batiaghata) was selected as illustrative sites where all four market-system failures were simultaneously observable; the structural drivers themselves are triangulated across a wider set of KIIs spanning BWDB, MoWR, ADB, donor, academic (BUET/IWFM), and local-level respondents, and are treated as generic to BWDB's broader organizational challenge only where the same driver was independently corroborated by multiple, institutionally distinct respondents. Where a finding rests on a single respondent's perception rather than corroborated evidence, this is flagged in context.

3.3.1 Understanding the BNR Cycle in Coastal Infrastructure

The BNR cycle manifests in practice across Bangladesh's coastal polders. As professor and director of the Institute for Water and Flood Management (IWFM) at BUET observed in the KII: 'The system keeps rebuilding because it cannot sustain what it builds. The incentive structure rewards construction and punishes maintenance. Until that changes, the cycle will not stop.'

The statement matches with the study findings and field visit experience. During the field visit to Dacope Upazila in Khulna, the study team observed three overlapping evidence streams that together illustrate how the BNR cycle operates in practice:

- ▶ **Embankment** breaches at Tildanga Union, Dacope Upazila (October 2025): Multiple man-made and storm-driven breaches, worsened by delayed repair and competing livelihood interests.
- ▶ **Sluice** gate dysfunction in Polder 31, Khulna: Severe sedimentation blocking gate operation, combined with lack of routine maintenance, had rendered the structure unable to regulate water flow.
- ▶ **Canal** siltation following ECB projects: ECB reconstruction created temporary embankment improvements but left drainage canals choked with spoil — a pattern now recurring with each construction cycle.

During the interview with a local farmer and former water management group member at Batiaghata Upazila of Khulna, he mentioned that the same section of embankment has been rebuilt four times in 14 years.

Field documentation — Dacope Upazila, Khulna · October 2025 field visit



Embankment breach at Tildanga Union, Dacope Upazila (October 2025). Man-made and storm-driven breaches illustrate the BNR cycle in practice — capital investment without O&M commitment, followed by catastrophic failure and emergency reconstruction.

Field documentation — ECB reconstruction context

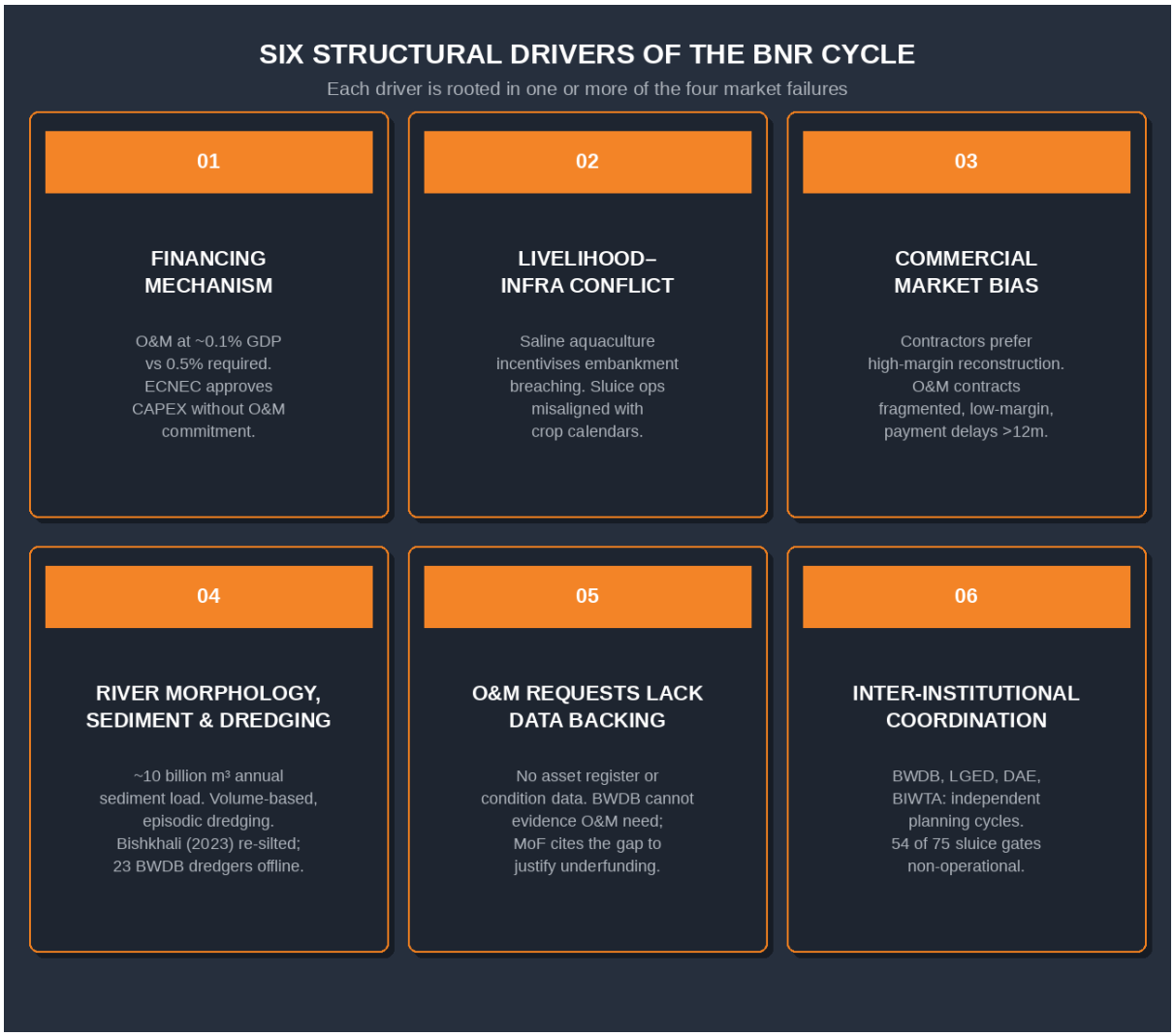


Road and embankment construction, Dacope Upazila. ECB campaigns create temporary improvements but leave drainage canals choked with spoil — a pattern recurring with each construction cycle.

3.3.2 Six Structural Drivers: KII Evidence and Market System Linkages

The market system failures identified in Section 3.2 manifest in practice as six structural drivers that sustain the BNR cycle. Table 6 maps each driver to its root market system and the direct KII evidence that confirms it.

Figure 5: Six structural drivers of the BNR cycle



Six structural drivers — each rooted in one or more of the four market failures — collectively sustain the BNR equilibrium. Reform must address all six simultaneously to be effective.

Table 6: Six structural drivers of the BNR cycle — market system roots and section 3.4 linkages

Structural Driver	Root Market System (Section 3.2)	Primary KII Evidence	Section 3.4 Pains / Gains
1. Financing Mechanism	Financing Market	MoF, ERD, donors structurally biased to CAPEX; O&M requests lack data backing; USD 375M CEIP-1 capital, no O&M provision.	Pain: capital investment crowds out O&M each budget cycle. Gain: reconstruction projects generate political visibility and BWDB career advancement.

2. Livelihood & Hydro-Agricultural Conflicts	O&M Market (demand side)	Water operations misaligned with crop calendars (DAE). Embankment cuts by local actors for aquaculture. Uttaran: rigid structures worsen waterlogging.	Pain: infrastructure damage from mis-operation; agricultural productivity loss. Local people lose their livelihood assets as well. Gain: local actors gain immediate livelihood access via embankment modification.
3. Commercial & Reconstruction Market Interests	Infrastructure Construction Market (supply side)	Contractors optimise for reconstruction (Abdul Monem, Western Engineering). ECB: short-duration campaigns reinforce high-output interventions.	Pain: O&M supply market cannot develop. Gain: reconstruction contracts generate significantly higher margins than O&M contracts.
4. River Morphology, Sedimentation, and Dredging	Asset Management Market (supply/support); O&M Market (supply side) and Financing Market	~10 billion m3 annual sediment load exceeds project-based dredging capacity. 23 BWDB dredgers non-operational. Dredging contracts structured around excavation volume. Bishkhali River project (2023): re-silted before completion; 23 dredgers non-operational. (Source: IWM Sediment Transport and River Morphology Study, 2020; BWDB Dredging Programme Review, 2021.) This high baseline sediment load is a natural characteristic of Bangladesh's deltaic river system and renders project-based episodic dredging structurally inadequate as a long-term management strategy.	Pain: rapid re-siltation renders episodic dredging ineffective; dredging as reactive crisis response. Gain: repeated dredging campaigns sustain contractor revenue; volume-based contracts generate predictable revenue for dredging firms.
5. O&M Requests Lack Data Backing	O&M and Asset Management	BWDB cannot prove where the money goes. The Ministry of Finance uses this absence of data to justify continued underfunding of O&M.	**Pain:** O&M requests are routinely rejected because they carry no verified asset-condition evidence. **Gain:** Absence of data preserves MoF's discretionary control over maintenance budget allocation.
6. Inter-Institutional Coordination	All four markets (rules/support)	BWDB, LGED, DAE, BIWTA manage different infrastructure components with no unified planning framework. Roads on embankment crests without hydraulic assessment.	Pain: accumulated damage from uncoordinated interventions; no institution owns cumulative performance. Gain: fragmented mandates protect agency autonomy.

The BNR cycle persists in Bangladesh's polder system because, as the market system analysis in Section 3.2 establishes, infrastructure deterioration is not an accidental outcome — it is the predictable product of a set of institutional rules, commercial incentives, and coordination failures that together make reconstruction the only viable institutional response.

1. Financing Mechanism: At the macro level, reconstruction is activated when asset deterioration begins to undermine fiscal credibility. O&M allocations stand at approximately 0.1% of GDP, far below what lifecycle management requires (0.5% as per Bangladesh Delta Plan 2100). The World Bank's

own CEIP-1 project invested USD 375 million to rehabilitate coastal embankments with no structured O&M provision embedded at approval stage. Bangladesh's LDC graduation (extended to 2029) will reduce access to concessional financing, making this loop increasingly costly.

2. Livelihood and Hydro-Agricultural Issue: At the local level, reconstruction is frequently triggered by conflicts between infrastructure operation and local livelihoods. A respondent from the Department of Agricultural Extension (DAE) identified a persistent mismatch between sluice gate operation schedules and agricultural calendars. A former Additional Chief Engineer of BWDB confirmed that embankment cuts are sometimes intentionally created by local actors for aquaculture. Combined with drainage failures caused by sluice gate mismanagement, these practices accelerate infrastructure deterioration while existing maintenance arrangements remain largely reactive.

3. Commercial and Reconstruction Market Interest: The private sector contracting environment also plays a structural role in sustaining the BNR cycle. Major contractors consistently prioritize reconstruction packages because they offer higher contract values and more predictable cash flows. Routine O&M contracts are fragmented, low-margin, and subject to payment delays exceeding 12 months. The Bishkhali River dredging project (2023) re-silted before completion — a direct consequence of contracts designed around volume targets rather than hydraulic outcomes.

4. River Morphology, Sedimentation and Dredging: Bangladesh’s deltaic rivers carry roughly 10 billion cubic metres of sediment a year, a volume that makes project-based, episodic desilting structurally incapable of holding channel capacity. Dredging practice compounds the problem: contracts are structured around excavation volume rather than hydraulic performance, which rewards repeated intervention in morphologically declining channels rather than durable improvement. In 2023, BWDB’s BDT 45 crore dredging project on the Bishkhali River in Bagerhat remained 25 percent incomplete beyond its deadline, with completed sections already re-silting. Twenty-three BWDB dredgers were non-operational at the time of the assessment, leaving the Board dependent on outsourced reactive campaigns.

5. O&M Requests Lack Data Backing: BWDB cannot demonstrate where maintenance money goes. There is no GIS-linked national asset register, no standardised condition-assessment protocol, and no systematic record of preventive maintenance performance. Physical deterioration therefore remains administratively invisible until failure. The Ministry of Finance cites this absence of verified asset-condition evidence to justify continued O&M underfunding, which in turn removes the resources needed to build the very data systems that would substantiate future requests.

6. Inter-Institutional Coordination: The assessment found that many infrastructure failures in coastal polders stem not only from technical neglect, but from the absence of coordinated governance across agencies. BWDB, LGED, DAE, and BIWTA operate on the same physical infrastructure — embankments, sluice gates, drainage canals, and river channels — yet each plan and intervenes independently. No agency is accountable for the cumulative outcome.

These six structural drivers are not independent variables that can be addressed individually. As Section 3.2 demonstrates, they are the operational expression of a closed institutional loop in which each market failure amplifies the others. Reform that targets only one driver — for example, increasing O&M allocations without addressing the asset management data gap — will not break the cycle.

KEY INFORMANT INTERVIEW

"The cost of building a structure is 1; the cost of losing it to neglect is 25. We cannot afford to keep building; we must start governing."

— WORLD BANK SECTOR LEAD, BANGLADESH, KEY INFORMANT INTERVIEW

3.4 Mapping Systemic Pains and Gains

Section 3.2 mapped four interconnected market systems — infrastructure construction, operation and maintenance, asset management, and financing — and Section 3.3 demonstrated how their compounded failures manifest as six structural drivers of the BNR cycle. This section applies the Value–Loyalty–Loss (VLL) framework to explain why this cycle persists despite its evident costs: by identifying which actors gain from the current equilibrium, which bear its costs, and what loyalties sustain the system even when its dysfunction is acknowledged.

Table 7: Market system pain–gain matrix: who benefits from the BNR equilibrium and who bears the cost

Note for reader: For an actor-specific breakdown — showing what each key actor gains from the current system, what they risk losing through reform, what benefits change could offer them, and what might incentivise their support — see Table 8: Adaptive Interpretation of Institutional Factions later in this section.

Market System	Who Gains	Gain Logic	Systemic Pain	Who Bears the Cost
Infrastructure Construction Market	Contractors, BWDB engineers, consultants	Reconstruction contracts offer significantly higher margins than O&M contracts; career advancement tied to high-value project delivery.	Premature asset failure; lifecycle costs significantly higher than prevention costs.	State, taxpayers, future O&M budgets
O&M Market	Emergency repair crews, WMCs (project-phase only)	Emergency repairs trigger funding and political attention; routine maintenance generates no institutional reward.	Infrastructure operates significantly below intended capacity (e.g., 54 of 75 sluice gates non-operational in Dumuria Upazila).	Farmers, WMCs, local livelihoods
Asset Management Market	Project-based consultants, donor agencies	Episodic assessments generate repeat contracts; no accountability for acting on condition data.	Deterioration invisible to decision-makers; O&M financing cannot be justified without condition data.	MoF/ERD (credibility trap); BWDB field offices
Financing Market	MoF, ERD, donors, large contractors	CAPEX approvals generate political visibility and donor disbursement credibility.	O&M allocations ~0.1% GDP vs. BDP2100 target of 0.5%; structural fivefold shortfall.	Polder communities; long-term infrastructure performance; Bangladesh LDC graduation readiness Citizens as a whole through reduced flood protection, disrupted livelihoods, agricultural losses, waterlogging, and constrained climate adaptation

Rather than viewing the BNR cycle as a simple technical or financial failure, the analysis reveals that the cycle is sustained by a consistent pattern of institutional reward: every major actor in the system — BWDB divisions, contractors, financing agencies, political actors — earns more from reconstruction than from prevention. The cycle is stable because it distributes rewards to the powerful and costs to the vulnerable.

The VLL analysis further reveals that the persistence of the BNR cycle is linked to several reinforcing realities within the institutional system:

- **BWDB** divisions and engineering units remain institutionally oriented toward high-visibility construction and emergency reconstruction, as career advancement is tied to managing large project budgets and emergency responses.
- **Central** financing and planning bodies maintain strong control over budget allocation due to the absence of reliable asset condition data, reinforcing the credibility trap that keeps O&M allocations low.

- **Contractors**, consultants, and dredging firms benefit more from repeated reconstruction and excavation cycles than from long-term asset management services.
- **Local** political actors gain greater public visibility during emergency reconstruction and disaster response than through sustained preventive maintenance.
- **Water** Management Committees (WMCs) often operate with limited authority and continuity, reducing long-term local ownership of infrastructure maintenance.

At the same time, the analysis identified several systemic pains generated by the cycle:

- **Repeated** rehabilitation of prematurely failed infrastructure is creating increasing fiscal pressure, particularly as Bangladesh approaches LDC graduation in 2029.
- **Weak** asset-condition monitoring and fragmented infrastructure data reduce BWDB's ability to justify timely O&M financing and preventive action.
- **Reductions** in localized field monitoring functions allow small infrastructure defects to remain undetected until they escalate into costly failures.
- **Fragmented** responsibilities between BWDB, LGED, BIWTA, DPHE, and other agencies continue to weaken coordinated water and sediment management.
- **Embankment** failures and prolonged drainage congestion create downstream impacts on agriculture, drinking water security, and public health.

Table 8 summarizes the adaptive interpretation of stakeholder values, loyalties, and perceived losses within the current institutional system.

Table 8: Adaptive interpretation of institutional factions

Stakeholder Group	What they value most	Why the current system works for them	Why change is resisted
BWDB Divisions	Visible, large infrastructure projects	Career growth depends on large budgets, construction projects, and emergency responses.	Maintenance-focused systems reduce visibility and high-profile project opportunities.
Central Planning & Finance	Strong control over national budgets and spending discipline	Ability to approve or reject funding based on limited or uncertain data.	Reduced control if funding becomes automatic or data-driven.
Engineering Consultants	High-standard technical design work	Earnings increase with larger construction and rehabilitation projects.	Long-term maintenance systems reduce repeated design and supervision opportunities.
Large Dredging Firms	High-volume excavation work	Regular income from repeatedly silted channels.	Performance-based sediment management reduces repeated excavation demand.
Tier-1 Contractors	Stable and profitable project delivery	Flexibility within current procurement and implementation arrangements.	Strong monitoring and quality enforcement reduce operational flexibility.
Local Political Actors	Visible infrastructure delivery	Public visibility from reconstruction and emergency response.	Preventive maintenance generates limited political recognition.
Water Management Committees	Immediate protection of local livelihoods	Functioning mainly as project-linked formal structures.	Stronger accountability may increase institutional responsibilities.

"The BNR cycle will not be resolved through technical training alone. It will persist until the institutional system begins rewarding prevention as strongly as it rewards reconstruction."

— Engineering Construction Brigade (ECB), Bangladesh Army, key informant interview

The findings across Sections 3.2, 3.3, and 3.4 collectively establish that the BNR cycle is not an isolated infrastructure problem — it is a stable institutional equilibrium sustained by misaligned incentives, absent condition data, fragmented coordination, and structural financing bias toward reconstruction. Chapter 4 translates these findings into six validated leverage points for reform.



04

Recommendations

Vision for change, leverage points, operational nudges and change agents.

04 Recommendations

The recommendations in this chapter are structured around the four interconnected market system failures that sustain the BNR cycle, as identified in Section 3.2. Each recommendation is therefore designed not as an isolated policy fix, but as a structural shift that simultaneously realigns incentives, financing rules, and coordination mechanisms across all four functional markets.

4.1 Vision for Change to Break the BNR

The BNR cycle persists because the system consistently rewards reconstruction over prevention through financing structures, procurement rules, institutional incentives, and coordination failures. The vision for change is therefore not a technical solution, but a shift in the system's underlying institutional logic: one in which infrastructure durability becomes the most rational and most rewarded outcome for every actor in the system. Six systemic conditions must hold simultaneously for this transition to occur:

Table 9: Vision for change — six systemic conditions

Condition	Required Shift	Who Can Make the Shift and How
Financing	No new project approval without a committed, costed 10-year O&M plan embedded at project approval stage.	BWDB: Ensure O&M plan is well prepared, updated regularly, and submitted to MoF in a routine basis. MoF: Ensure the O&M plan is received and budget is allocated in a routine manner.
Livelihood	Legally enforceable no-net-breach mechanisms; sluice operation coordinated with agricultural calendars through joint BWDB–LGED–DAE protocols.	BWDB: Ensure coordination with LGED and DAE in both field and central leve. BWDB: Ensure joint sluice operation in coordination with Local Government (Home Minister of Bangladesh said the sluice will be operated under LG institutes)[1]. WMO: WMOs will be formed and trained by BWDB, in consultation and communication with LGED and DAE so WMOs role will be defined, and they will be able to take necessary steps when necessary.
Market	Bundled, multi-year performance-based O&M contracts replace fragmented, delayed, reconstruction-biased contract structures.	BWDB: The Contract and Procurement Division will publish tenders for works addressing O&M issues.
River Morphology and Dredging	Implement integrated river basin sediment management to address upstream siltation and reduce recurring hydraulic failure, replacing volume-based excavation targets with performance-based indicators such as maintained channel depth and sluice gate operability.	BWDB: BWDB will introduce and maintain a Sediment Management System, and move toperformance based dredging from volume based dredging.
Coordination	Joint coastal infrastructure mechanism — BWDB, LGED, DAE, and BIWTA plan and intervene within a unified hydraulic planning	BWDB: Assess the coordination mechanism, and lead the coordination committee.

[1] https://www.prothomalo.com/bangladesh/district/tv8xx13861

	framework rather than fragmented sectoral mandates.	

4.2 Identified and Validated Leverage Points

The market system analysis in Section 3.2 identifies the structural root causes of the BNR cycle. The six validated leverage points translate these root causes into actionable reform instruments.

Table 10: Leverage points mapped to root market system failures

Leverage Point	Root Market System Failure	Failure Mechanism Targeted	Reform Instrument	Validation and Contestation
1. Financing Gap for O&M	Financing Market + Asset Management Market	Supply: capital bias to CAPEX. Rules: no lifecycle costing at ECNEC. Support: asset registry absent.	Mandatory 10-year O&M financing plan embedded at project approval; O&M as conditionality for ECNEC approval.	Stakeholders including BWDB, ADB, MoWR agreed this is a major problem. MoF said an asset registry is needed before long-term O&M funding can be committed.
2. Livelihood–Infrastructure Conflict	O&M Market (demand side) + Infrastructure Construction Market (rules)	Demand: no accountable local demand for routine maintenance. Rules: no breach enforcement mechanism.	Legally enforceable no-net-breach mechanisms; joint BWDB–LGED–DAE sluice–agricultural calendar protocol.	Field evidence confirmed the enforcement gap. Local community members raised concerns about land access and compensation.
3. Commercial Market Incentives	Infrastructure Construction Market (supply side) + O&M Market	Supply: contractors optimise for reconstruction contract value. O&M margin too low for market to develop.	Multi-year bundled O&M performance contracts; ECB breach-response guarantee removed from reconstruction loop.	Both Tier-1 and local Contractors said O&M contracts are not profitable enough. ECB mentioned to keep some emergency response role.
4. River Morphology and Dredging	Asset Management Market (support functions) + O&M Market (supply side)	Support: no basin-level sediment data system; dredging episodic and project-bound. Supply: volume-based excavation contracts; no functional performance targets. 23 BWDB dredgers non-operational.	Implement an integrated river basin sediment management system combining real-time monitoring, modelling, and coordinated dredging, with performance-based contracts measured by channel depth and sluice gate operability rather than excavation volume.	Respondents from BUET, CEGIS, BWDB agreed on the sedimentation problem. They also focused on who should lead basin-level planning, and contractors questioned fixed performance targets.
5. O&M is not Data Backed	O&M Market (Demand Side) + Financing Market (supply side)	Demand: BWDB lacks an updated O&M system to secure fund from MoF. Supply: MoF requires time-based, regular O&M data on the infrastructure/asset from BWDB.	Establish a Shadow Digital Asset Registry (SDAR) linking field-level condition data to BWDB's budget submissions, supported by a MoWR directive requiring standardised Asset Condition Reports as a mandatory prerequisite for all O&M funding requests to MoF.	Stakeholders inclusing Dr. Hala, CEGIS, BUET, ERD Consultant agreed that lack of data is blocking O&M funding.
6. Inter-Institutional Coordination	All four markets — rules and support functions	Rules: fragmented mandates (BWDB, LGED, DAE, BIWTA). Support: no shared data	Joint coastal water infrastructure coordination mechanism with shared planning authority and accountability framework.	Almost all stakeholders agreed coordination is weak. The main disagreement was whether BWDB should lead

		or joint planning mechanism.		or decisions should be shared jointly.

Figure 6: Systemic pathway of change

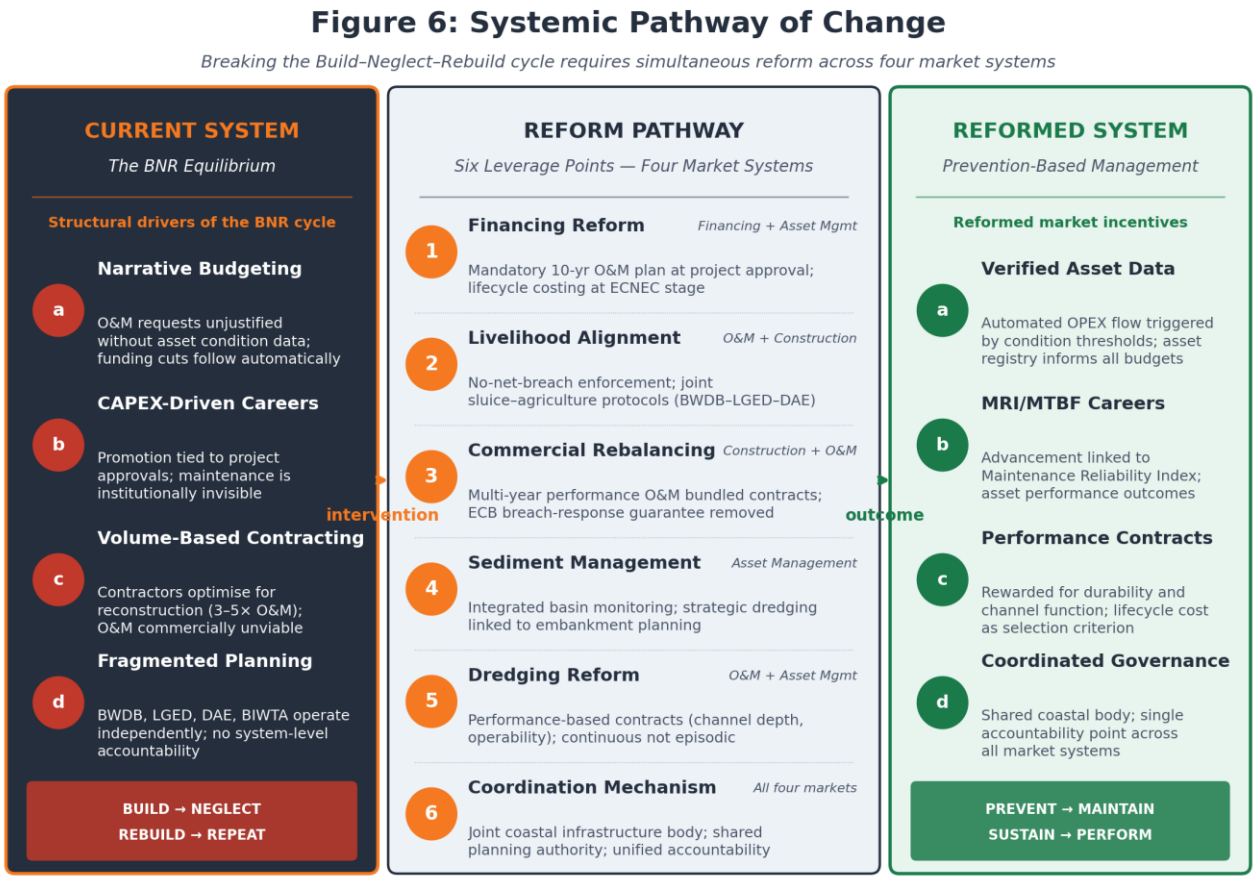


Figure 6: Systemic Pathway of Change — from the current BNR equilibrium through targeted reform interventions toward a process-driven, lifecycle-oriented infrastructure governance model.

Leverage Point 1: Mitigate the Financing Gap for O&M

One of the strongest structural drivers of the BNR cycle is the political preference for capital expenditure (CAPEX) over operation and maintenance (O&M). New infrastructure projects generate political visibility and public recognition. Routine O&M activities remain politically invisible despite their long-term importance. This creates continuous pressure for new CAPEX approvals while existing assets deteriorate.

Market system root	Financing Market (supply bias to CAPEX; no lifecycle costing at ECNEC) + Asset Management Market (no asset condition data to substantiate O&M budget requests).
Validated leverage point	**No new water infrastructure project should receive approval without a jointly endorsed 10-year O&M financing commitment embedded at ECNEC approval stage.**
Expected systemic effect	Shifts political and institutional incentives from repeated construction toward sustained infrastructure performance. Makes long-term asset functionality a shared financing and governance responsibility.

Leverage Point 2: Mitigate Livelihood–Infrastructure Conflict

A major driver of the BNR cycle is the growing misalignment between infrastructure operation and local livelihoods. Sluice gate mismanagement and weak maintenance disrupt planned drainage and agricultural

cycles. Embankment breaches are sometimes intentionally created to enable saline water entry for shrimp aquaculture. Field evidence (e.g., Tildanga Union, Dacope Upazila, October 2025) shows that multiple man-made breaches contributed to embankment collapse.

Market system root	O&M Market — demand-side failure (WMCs absent; no accountability for breach prevention) + Infrastructure Construction Market (rules: no breach enforcement mechanism).
Validated leverage point	**Introduce legally enforceable no-net-breach enforcement mechanisms. Integrate sluice operation protocols with agricultural calendars through a joint BWDB–LGED–DAE operational protocol.**
Expected systemic effect	Reduces infrastructure deterioration triggered by livelihood conflicts. Activates local accountability for routine maintenance and establishes WMCs as genuine demand-side actors.

Leverage Point 3: Rebalance Commercial Market Incentives

A key structural driver of the BNR cycle is the commercial preference for reconstruction over maintenance. Major contractors consistently prioritize reconstruction packages because they offer higher contract values and more predictable cash flows. Routine O&M contracts are fragmented, low-margin, and often face payment delays exceeding 12 months.

Market system root	Infrastructure Construction Market — supply-side failure (reconstruction commercially dominant) + O&M Market (supply-side failure: no viable maintenance contracting model).
Validated leverage point	**Introduce bundled, multi-year O&M and performance-based contracts that integrate maintenance, minor repairs, and service continuity into long-term contractual frameworks.**
Expected systemic effect	Creates commercial incentives for private sector actors to invest in preventive maintenance capacity. Reduces dependence on emergency reconstruction as the only economically viable contracting model.

Leverage Point 4: Address River Morphology and Sedimentation Mismanagement

A fundamental structural driver of the BNR cycle is the absence of integrated river basin sediment management. Sedimentation in river channels raises riverbeds, increasing hydraulic pressure on embankments and reducing sluice gate operability. Evidence from Dumuria Upazila (Khulna) shows that 54 out of 75 sluice gates across 11 rivers are non-operational due to sedimentation.

Market system root	Asset Management Market — support function failure (no national asset registry; no basin-level sediment management system linking condition data to dredging prioritisation).
Validated leverage point	**Shift from project-based dredging to an integrated river basin sediment management system combining real-time sediment monitoring, basin-level data systems, and coordinated dredging aligned with hydrological targets.**
Expected systemic effect	Transitions dredging from reactive crisis response to planned basin-level management. Reduces the rate at which sedimentation triggers infrastructure failure and emergency reconstruction.

Leverage Point 5: Reform Reactive Dredging Practices

A key structural driver of the BNR cycle is the current dredging model, which prioritises excavation volume over hydraulic performance outcomes. Dredging contracts are primarily structured around cubic meter excavation targets rather than sustained channel functionality. Limited operational capacity (e.g., 23

BWDB-owned dredgers currently non-operational) weakens proactive sediment management. Field evidence (e.g., Bishkhali River project, 2023) shows that even after significant investment, partially completed dredging sections re-silted before project completion.

Market system root	O&M Market — supply-side failure (volume-based dredging; no channel-performance targets) + Asset Management Market (no condition data to direct dredging prioritisation).
Validated leverage point	**Shift dredging contracts from volume-based excavation targets to performance-based river functionality indicators, such as maintained channel depth and sluice gate operability.**
Expected systemic effect	Aligns dredging investment with hydraulic outcomes rather than excavation milestones. Reduces the re-siltation cycle that currently makes each dredging investment a temporary fix.

Leverage Point 6: Strengthen Inter-Institutional Coordination

A structural driver of the BNR cycle is fragmented governance, where multiple agencies manage shared physical infrastructure under independent planning cycles. BWDB, LGED, DAE, and BIWTA operate on the same physical infrastructure system but plan and implement interventions independently. No single institution is accountable for cumulative system performance, leading to failure at inter-agency boundaries.

Market system root	All four markets — rules and support function failure: fragmented mandates prevent any single institution from managing the hydraulic system as a whole.
Validated leverage point	**Establish a joint coastal water infrastructure coordination mechanism with shared planning authority across BWDB, LGED, DAE, and BIWTA.**
Expected systemic effect	Eliminates failure at inter-agency boundaries by assigning shared accountability for cumulative system performance. Positions BWDB to coordinate rather than merely execute within a multi-agency hydraulic governance framework.

> *'The BNR cycle will not be resolved through technical training alone. It will persist until the institutional system begins rewarding prevention as strongly as it rewards reconstruction.'*
> **— Engineering Construction Brigade (ECB), Bangladesh Army, Key Informant Interview**

This market system logic has a direct implication for reform sequencing. The leverage points in this section are not independent — they are structurally linked. Reform that targets only the financing gap without simultaneously addressing the commercial market bias will shift budget without changing behaviour. Effective reform therefore requires simultaneous intervention across all four market systems.

4.3 Operational Nudges to Address BNR

The operational nudges proposed here do not all require major policy reform. Several can be introduced immediately through existing BWDB administrative systems and procurement processes.

Quick Wins: These actions can be implemented through internal BWDB administrative decisions, with minimal legislative or inter-agency coordination required.

- ▶ **Include** asset history in procurement documents. All procurement documents for civil works should include the last recorded condition assessment of the asset being rehabilitated.
- ▶ **Record** preventive maintenance performance. Field engineers who identify and resolve defects before failure should have this recorded in their Annual Confidential Reports (ACRs).
- ▶ **Report** maintenance performance annually. BWDB divisional reports should separately present O&M expenditure by asset type, maintenance completion rates, and deferred maintenance backlogs.

Long-term Interventions: These measures require coordination across agencies, financing institutions, and policy frameworks.

▶ **Require** asset condition evidence for financing. Budget submissions, development project proposals, and external financing requests for water infrastructure should be required to include verified asset condition assessments.

▶ **Introduce** mandatory post-failure reviews. Infrastructure that fails within five years of construction or rehabilitation should trigger a mandatory post-failure review, linking findings to procurement accountability.

▶ **Institutionalize** inter-agency clearance. Interventions affecting shared hydraulic infrastructure should require coordination sign-off from all relevant agencies before implementation.

4.4 Change Agents for Instigating Reforms

4.4.1 Identified Change Agents

Section 3.3.2 identified six structural drivers that sustain the Build–Neglect–Rebuild (BNR) cycle and highlighted the areas where institutional reform is most needed. These include:

- **O&M Financing Gap:** CAPEX-biased approvals leaving O&M spending at ~0.1% of GDP against a required 0.5%.
- **Livelihood–Infrastructure Conflict:** Misalignment between sluice operations and crop calendars, alongside deliberate embankment cuts for saline aquaculture.
- **Commercial Market Bias:** Procurement frameworks that reward high-margin reconstruction over routine maintenance.
- **Morphological & Sediment Dynamics:** The large volume of silt deposited each year makes project-based dredging unsustainable.
- **Absent Asset Condition Data:** Lack of formal, data-based asset registries, keeping physical deterioration administratively invisible.
- **Inter-Institutional Fragmentation:** Uncoordinated planning among agencies including BWDB, LGED, DAE, and BIWTA on shared hydraulic assets.

Building on the structural drivers identified through the analysis, potential change agents were identified to support institutional reform. Respondents were assessed against three key characteristics:

- They proactively address operational challenges and improve day-to-day processes without waiting for formal direction.
- They consider long-term organizational needs and seek opportunities to improve systems, processes, and ways of working.
- They remain engaged in overcoming institutional challenges and continue working toward sustainable improvements, even when progress is gradual and requires persistence.

The individuals presented in Table 11 were identified through the Key Informant Interviews (KIIs) as potential change agents with the capacity to advance institutional reform within Bangladesh's water sector. Each individual demonstrated proactive leadership in addressing one or more systemic challenges and occupies a position that provides the influence and opportunity to champion process-driven change. The table summarizes their assessed reform readiness, area of demonstrated proactivity, and institutional influence. The identified change agents also represent a priority group for targeted capacity development. Strengthening their technical, leadership, and change management capabilities can enhance their ability to drive reform, influence institutional change, and sustain organizational momentum.

Table 11: Identified change agents and their reform leverage potential

Change Agent	Reform Readiness & Structural Alignment	Area of Demonstrated Proactivity	Institutional Influence
Additional Chief Engineer, BWDB (River Management Wing)	**High (3/3)** – Strong alignment with the six structural drivers, particularly river operations, dredging, and asset management.	Promoted a shift from volume-based dredging to outcome-based river management, focusing on long-term river functionality rather than project outputs.	Highly respected technical leader within BWDB, with strong credibility among senior management and field engineers, enabling peer-led operational reform.
Joint Secretary, Reform Management & Policy Research Unit	**Moderate (2/3)** – Moderate alignment with the structural drivers, particularly human resource management and performance systems.	Leading efforts to strengthen staff performance evaluation and introduce incentives that encourage preventive maintenance and long-term asset management.	Holds a formal mandate to lead institutional reform, providing direct influence over performance management and organizational change.
Deputy Secretary, Planning Division, Ministry of Water Resources (MoWR)	**High (3/3)** – Strong alignment with financing, planning, and inter-agency coordination.	Promotes integration of operation and maintenance (O&M) considerations into project planning and investment decisions before project approval.	Well positioned to coordinate across ministries and influence planning, budgeting, and policy decisions related to water infrastructure investments.
Delegated Representative (Water), Embassy of the Kingdom of the Netherlands (EKN)	**High (3/3)** – Strong alignment with strategic planning, financing, and institutional governance.	Encourages long-term approaches that integrate asset management, maintenance, and institutional resilience into bilateral cooperation.	Trusted development partner with strong access to senior government decision-makers and influence over future programme design and financing priorities.
Senior Policy Advisor, Embassy of the Kingdom of the Netherlands (EKN)	**High (3/3)** – Strong alignment with asset management and institutional strengthening.	Promotes the integration of asset management systems, maintenance planning, and data-driven decision-making into technical assistance programmes.	Recognized technical advisor with strong credibility in sector coordination and policy dialogue, enabling evidence-based institutional reform.
JICA Advisor to BWDB	**High (3/3)** – Strong alignment with maintenance financing and technical capacity development.	Advocates for maintenance-inclusive infrastructure investments and supports strengthening BWDB's technical capacity for long-term asset management.	Long-standing institutional partner with strong relationships across BWDB, allowing maintenance-focused recommendations to gain internal acceptance.

4.4.2 Institutionalizing Change Agents Through Role-Based Leadership

The identified change agents represent the current institutional leadership for advancing reform. Given the regular rotation, promotion, and retirement of public officials and development partner representatives, a role-based approach provides a mechanism for sustaining change agency across successive officeholders.

This role-based approach shifts the focus from who currently champions reform to which institutional positions are strategically placed to sustain it over time. By assigning change-agent responsibilities to key positions, reform leadership can continue as successive officeholders assume these roles. This approach

also strengthens institutional memory, reduces dependence on individual leadership, and supports continuity throughout organizational transitions.

To operationalize this transition, reform responsibilities should be formally integrated into the mandates of key positions and supported through structured knowledge transfer, documented reform priorities, leadership orientation, and continuous capacity development. This ensures that incoming officeholders inherit not only the responsibilities of their position but also the institutional commitment to advancing process-driven reform. Table 12 presents the proposed transition from individual change agents identified through the KII analysis to institutional roles that can sustain reform over the longer term.

Table 12: Institutionalizing change agency through role-based leadership

Current Individual Champions	Institutional Role to be Institutionalized	How the Role is Sustained	Proposed Continuity Mechanism
Additional Chief Engineer, River Management Wing (BWDB)	Lead for river management and asset management reform	Reform leadership is embedded within the office rather than the individual.	Formal handover of reform priorities, documented implementation roadmap, and leadership orientation for incoming officeholders.
Joint Secretary, Reform Management & Policy Research Unit (BWDB)	Lead for institutional reform, performance management, and organizational change	Reform responsibilities are embedded within the Reform Management & Policy Research Unit.	Successive officeholders continue implementation through established work plans, institutional mandates, and performance management systems.
Deputy Secretary, Planning Division, Ministry of Water Resources (MoWR)	Lead for lifecycle planning, financing coordination, and inter-agency collaboration	Coordination responsibilities remain institutionalized within the Planning Division.	Reform responsibilities are integrated into planning, budgeting, and project approval processes to ensure continuity across leadership transitions.
Delegated Representative (Water), Embassy of the Kingdom of the Netherlands (EKN)	Strategic lead for policy dialogue and financing alignment	Reform priorities are maintained within the bilateral cooperation programme.	Structured knowledge transfer and programme continuity ensure successive representatives continue strategic engagement (if continued).
Senior Policy Advisor, Embassy of the Kingdom of the Netherlands (EKN)	Technical lead for asset management and institutional strengthening	Reform functions are embedded within EKN's technical assistance programme.	Programme documentation, institutional knowledge management, and advisor transition processes maintain continuity (if continued)
JICA Advisor to BWDB	Technical lead for maintenance-oriented infrastructure planning and capacity development	Reform functions remain embedded within JICA's long-term advisory programme.	Successive advisors continue technical support through standardized guidance, knowledge transfer, and ongoing programme implementation (if continued).

4.5 Stakeholders Who Must Change to Enable BWDB's Transition

Breaking the BNR cycle requires more than technical reform: it requires specific actors within each of the four market systems to shift their behaviour, institutional logic, and accountability frameworks.

Table 13: Stakeholders by market system role and required behavioural shift

Stakeholder Group	Market System Role	Required Behavioural Shift
BWDB Divisions (Engineering and Field Offices)	Infrastructure Construction + O&M Market — demand side	Shift career incentives from large-budget project initiation to asset performance outcomes; adopt condition-based O&M planning.
Ministry of Finance / Planning Commission	Financing Market — supply side and rules	Shift from approving project-based CAPEX on narrative justification to requiring verified asset condition data as a precondition for capital approvals.
Private Contractors and Dredging Firms	Infrastructure Construction + O&M Market — supply side	Shift from volume-based and reconstruction-oriented contracting toward multi-year, performance-based O&M service delivery.
LGED, DAE, and BIWTA	All four markets — rules and support functions	Shift from operating as independent sectoral agencies to co-planning and co-approving interventions affecting shared hydraulic infrastructure.
Local Communities and Water Management Committees (WMCs)	O&M Market — demand side	Shift from passive beneficiaries to accountable demand-side actors for preventive maintenance, with enforceable no-net-breach commitments.
Donors and Development Partners	Financing Market — supply side	Shift from CAPEX-driven disbursement performance toward lifecycle-conditioned, outcome-based financing for water infrastructure.

4.6 Practical Implications for the Partners for Water (PfW) Initiatives

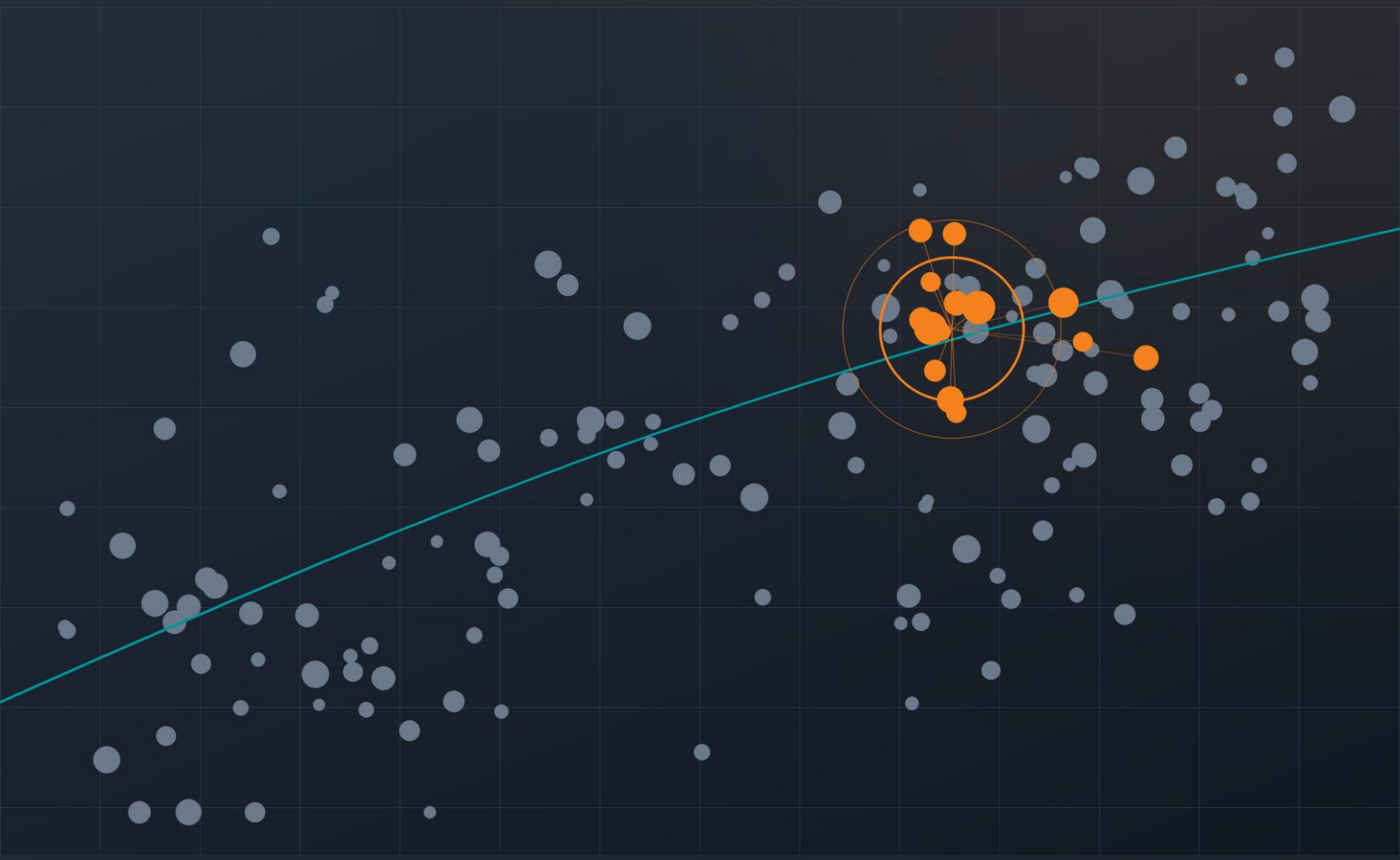
The systems analysis provides practical guidance for the four ongoing PfW initiatives by highlighting the institutional and behavioural conditions that must be addressed for reform to be effective and sustained.

Implementation of the Asset Management Roadmap: The findings show that asset management reform should go beyond technical tools and include stronger links between asset condition data, budgeting, and decision-making. The roadmap should therefore prioritise the operationalisation of the SDAR and ensure that asset information is routinely used to justify O&M funding and planning.

Design and Institutional Embedding of WWA Capacity Building: Capacity-building efforts should focus not only on technical skills, but also on the organisational behaviours and incentives that sustain the project-driven model. Embedding the training within BWDB and partner institutions will be important to ensure that new practices become part of regular institutional processes rather than one-off learning activities.

Selection and Design of Performance-Based Contracting Pilots: The analysis suggests that pilot contracts should be designed around functional outcomes, such as channel depth, sluice gate operability, and timely maintenance response, rather than excavation volume alone. The pilots should also test payment and monitoring arrangements that make O&M contracts commercially viable for contractors.

Implementation and Testing of the Proposed Institutional and Coordination Model in Polder 31: Polder 31 offers an important opportunity to test the proposed coordination mechanism in a real operational setting. The pilot can generate practical learning on joint planning, shared accountability, and community engagement, while also helping to refine the systemic findings and the proposed pathway for change before wider scale-up.



05

Co-Created Reform Roadmap

The BNR cycle is a stable institutional equilibrium.
Breaking it requires simultaneous reform across four domains.

05 Co-Created Reform RoadmapThis chapter presents the Phase 2 co-created roadmap for BWDB's transition from a project-driven to a process-driven organization. It is structured around the six validated leverage points identified in Chapter 4, organized across three implementation horizons, and accompanied by a responsibility matrix, resistance and incentive strategies, a risk register, a monitoring framework, and a set of early actions ready for immediate implementation. This roadmap is intended as a working document for validation at the August 2026 stakeholder workshop, after which it will be finalized as the Phase 2 report.

5.1 Phased Action Matrix

The roadmap is organized across three time horizons. Horizon 1 (0–12 months) focuses on the foundational actions that establish the enabling conditions for reform and can be taken by BWDB within its existing authority. Horizon 2 (12–36 months) covers systemic reforms that require inter-institutional coordination and policy or regulatory change. Horizon 3 (36+ months) addresses the long-term structural transformation of the financing and governance architecture.

Table 14: Phased action matrix — six leverage points across three horizons

Leverage Point	H1: 0–12 Months (Foundations)	H2: 12–36 Months (Systems Change)	H3: 36+ Months (Structural Transformation)
LP1: Lifecycle Asset Management	Pilot lifecycle cost planning for 3 polders; integrate O&M budgets into project approval documents	Mandate lifecycle cost analysis for all projects >BDT 100 crore; establish BWDB Asset Registry Unit	National Infrastructure Lifecycle Policy enacted; independent O&M audit function operational
LP2: Performance-Based Procurement	Design 2 performance-based contracts for O&M pilots in Khulna division; train BWDB procurement officers	Scale performance contracts to 10 sites; link contractor payments to verified maintenance outcomes	All BWDB O&M procurement under performance framework; volume-based dredging contracts phased out
LP3: Integrated O&M Financing	Ring-fence O&M budget line for pilot polders in FY2026-27 ADP submission; document baseline spending	Advocate for ADP–revenue budget coordination mechanism at MoF level; pilot O&M budget tracking system	O&M funding reaches 0.3% GDP; dedicated O&M appropriation in national budget independent of CAPEX
LP4: Asset Condition Data Systems	Procure mobile condition assessment tools; train 50 BWDB field engineers in standardized scoring	Deploy national asset condition database linked to budget planning; all new projects include condition baseline	Real-time O&M performance dashboard accessible to MoF, BWDB leadership, and donors
LP5: Institutional Incentive Reform	Design and pilot promotion criteria linking career advancement to maintenance outcomes; share with MoWR	Revise BWDB performance appraisal framework to include asset stewardship indicators	Civil service rules amended; BWDB engineers rewarded for long-term infrastructure performance
LP6: Inter-Institutional Coordination	Establish joint BWDB–LGED–DAE operational coordination protocol for Polder 31; form inter-agency working group	Formalize coordination mechanism across all coastal polders; integrate WMO roles into BWDB operational plans	Permanent inter-ministerial coordination body for water infrastructure governance operational

5.2 Responsibility Matrix

Table 15: Responsibility matrix — owners, supporting institutions and RVO/PfW role

Action Area	Primary Owner	Supporting Institutions	RVO/PfW Role
Lifecycle asset planning	BWDB (Planning & Design Wing)	MoWR, Planning Commission	Technical advisory; asset management roadmap implementation
Performance-based contracting	BWDB (Procurement Wing)	CPTU, contractors	Performance contract design support; PBC pilot co-design
O&M budget ring-fencing	MoWR / MoF	BWDB, ERD	Evidence provision; donor coordination advocacy
Condition data systems	BWDB (Operations Wing)	IWM, CEGIS	MIS system co-development; field tool procurement
Incentive reform	MoWR / Public Administration	BWDB HR, MoPA	Reform design support; international benchmarking
Inter-institutional coordination	MoWR (as chair)	BWDB, LGED, DAE, WMOs	Polder 31 pilot facilitation; coordination protocol design

5.3 Resistance and Incentive Strategies

The BNR cycle persists partly because reform threatens vested interests. The table below identifies the primary sources of resistance, the nature of the resistance, and the incentive strategies that can convert or bypass each resistance source.

Table 16: Resistance and incentive strategies by actor group

Actor	Nature of Resistance	Incentive / Bypass Strategy
BWDB engineers / divisions	Career advancement tied to large project budgets; O&M perceived as low-status work	Redesign promotion criteria to reward asset stewardship; create Asset Management Officer career track; pilot bonuses for divisions meeting O&M targets
Contractors	Volume-based contracts generate predictable revenue; shift to performance contracts creates financial risk	Phase transition over 2–3 years; provide technical capacity-building for performance contracting; guarantee minimum volumes in early performance contracts
Ministry of Finance	O&M requests rejected due to absence of verified asset data; inertia in ADP–revenue budget coordination	Present condition data and lifecycle cost evidence to MoF; frame O&M investment as fiscal risk reduction; engage ERD with international precedents
Donors (ADB, WB, JICA)	CAPEX preference driven by disbursement structures; O&M seen as recurrent cost outside mandate	Document reform appetite; propose blended CAPEX+O&M financing models; engage donors through RVO-led learning coalition

Actor	Nature of Resistance	Incentive / Bypass Strategy
Political actors	CAPEX generates electoral visibility; maintenance is politically invisible	Make citizen cost burden visible through media and communication campaigns; document impact of BNR cycle on LDC graduation targets

5.4 Risk Register

Table 17: Risk register — likelihood, impact and mitigation

Risk	Likelihood	Impact	Mitigation
Political change disrupts reform momentum	Medium	High	Embed reforms in administrative rules and budget codes independent of political cycle; build multi-party evidence base
Performance contracts underperform due to weak monitoring capacity	High	Medium	Invest in M&E systems first (LP4); phase PBC introduction with BWDB capacity building
O&M budget ring-fencing reversed at budget revision stage	High	High	Secure written MoF commitment; use donor co-financing to lock in O&M allocations; report publicly on O&M spending
Inter-institutional coordination body lacks decision authority	Medium	High	Ground coordination in MoWR-level mandate; link to IMED monitoring; engage PM Office on BNR cycle costs
WMO formation fails to deliver community stewardship	Medium	Medium	Align WMO roles with livelihood interests; provide legal recognition and long-term operational support (not just project-duration)
Workshop validation produces contested or diluted roadmap	Low	Medium	Pre-circulate draft; use structured consensus-building; document disagreements transparently for Phase 2 report

5.5 Monitoring Framework

The monitoring framework tracks progress on the six leverage points across the three horizons (H). Indicators are designed to be verifiable from existing BWDB administrative data supplemented by periodic field assessments.

Table 18: Monitoring framework — indicators, baselines and horizon targets

Indicator	Baseline (2025)	H1 Target (2026)	H2 Target (2027–28)	H3 Target (2029+)	Verification Source
% BWDB polders with lifecycle cost plan	0%	5% (3 pilots)	30%	80%	BWDB Planning Wing records
% O&M contracts performance-based	0%	2 pilot contracts	15%	60%	BWDB procurement database
O&M budget as % of total BWDB budget	~5%	8%	15%	25%+	BWDB annual budget submissions
Polders with digital condition records	0	3 pilots	25	100+	BWDB asset management system

Indicator	Baseline (2025)	H1 Target (2026)	H2 Target (2027–28)	H3 Target (2029+)	Verification Source
BWDB engineers with AM career pathway	None	Pathway designed	Pathway operational	30% of engineers enrolled	BWDB HR records
Inter-agency coordination meetings held	0/year	4 meetings (Polder 31)	12 meetings (multi-polder)	Standing committee operational	MoWR meeting minutes
Citizen-reported satisfaction with O&M	Not measured	Baseline survey conducted	10% improvement	25% improvement	Annual beneficiary survey

5.6 Early Actions (0–3 Months)

The following actions can and should be initiated immediately, within BWDB's existing authority and resource base, and within the ongoing PfW programme timeline. They do not require new legislation or significant additional funding. They demonstrate reform intent and generate the early evidence needed to build political and institutional support for the longer reforms.

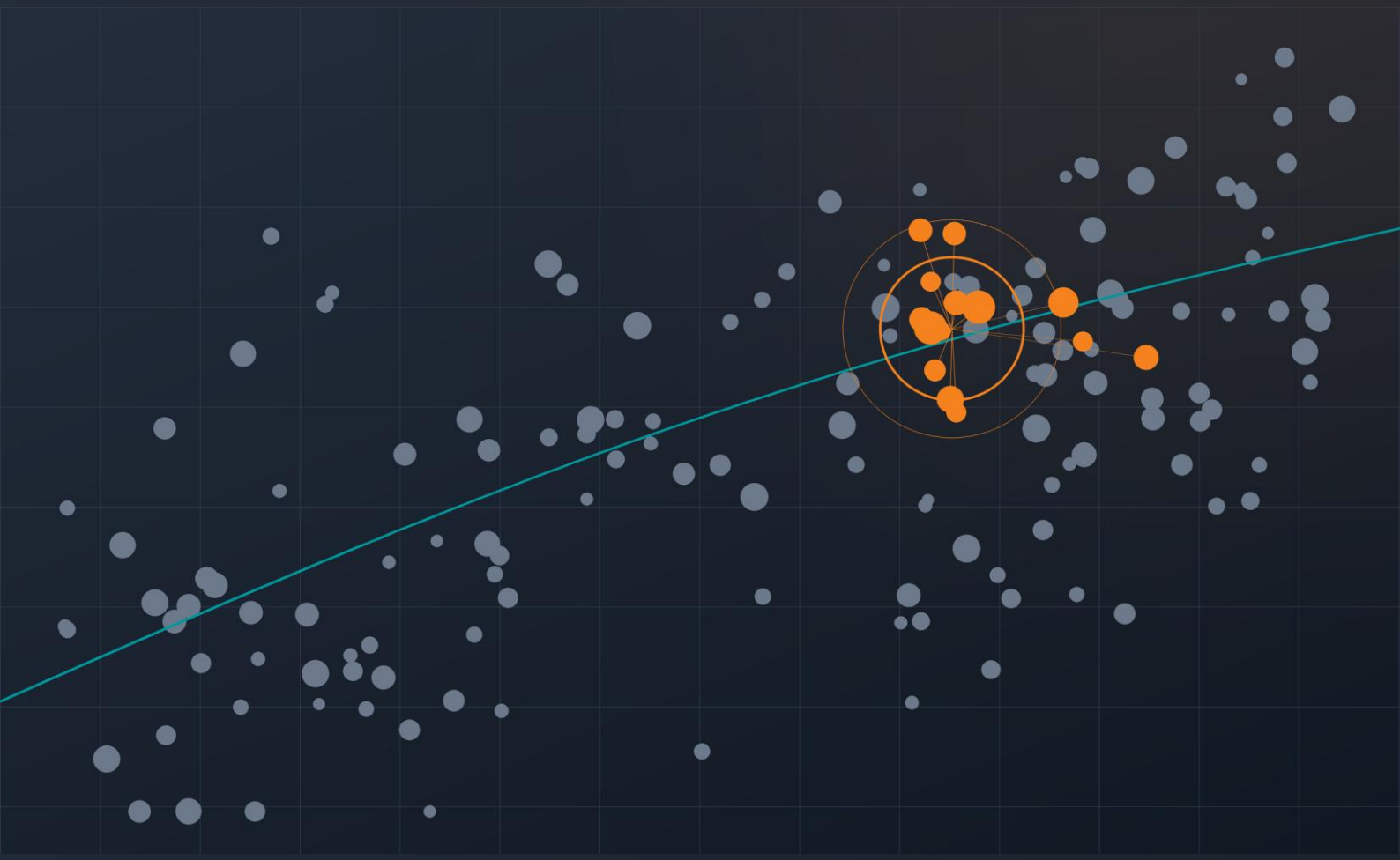
Table 19: Early actions — owners, timeframes and PfW support

Action	Owner	Timeframe	Required Resource	PfW Support Available
Convene inter-agency workshop to validate roadmap and assign ownership of each leverage point	BWDB + RVO	0–1 month	Meeting facilitation	RVO workshop facilitation support (August 2026)
Select 3 pilot polders for lifecycle asset planning trial (including Polder 31)	BWDB Planning Wing	0–2 months	BWDB staff time	Asset Management Roadmap team (Dr. Hala)
Draft lifecycle cost planning template for pilot polders; adapt from international AM standards	BWDB + Dr. Hala team	1–3 months	Technical consultant time	Asset Management Roadmap assignment
Design performance-based contract template for 2 O&M pilots in Khulna division	BWDB Procurement + PBC assignment	1–3 months	Consultant + legal review	PBC assignment (PfW)
Launch baseline asset condition survey in 3 pilot polders using mobile data tools	BWDB Operations Wing	1–3 months	Mobile tools + training	WWA capacity-building programme
Brief MoF/Planning Commission on lifecycle cost evidence; request O&M ring-fencing consideration for FY2027	MoWR + BWDB leadership	2–3 months	Evidence brief preparation	Innovision analytical support

Action	Owner	Timeframe	Required Resource	PfW Support Available
Initiate media and communication strategy on citizen costs of the BNR cycle	MoWR communications + research team	2–3 months	Communication consultant	RVO communications support

5.7 Note on Workshop Validation

This roadmap is a draft for co-creation. Its finalization is contingent on the stakeholder validation workshop planned for August 2026, in which BWDB leadership, RVO, and key institutional partners will review the phased actions, assign ownership, resolve contested items, and commit to early actions. The Phase 2 final report will document the outputs of this workshop, including areas of consensus, areas requiring further negotiation, and the agreed implementation plan.



06

Conclusion

How Bangladesh’s water infrastructure reforms can escape the institutional equilibrium that sustains the Build–Neglect–Rebuild cycle.

06 Conclusion

The Build–Neglect–Rebuild (BNR) cycle in Bangladesh's water sector is not mainly a technical issue, but a stable institutional equilibrium. Every major actor in the system — BWDB divisions, contractors, financing agencies, political actors — earns more from reconstruction than from prevention. The cycle is stable not despite its costs, but because its costs fall on infrastructure and communities while its rewards accrue to institutions.

Within this transition, the Netherlands Enterprise Agency (RVO) plays an important role; not as a traditional funder, but as an institutional anchor. RVO's convening power across BWDB, MoWR, the Planning Commission, and the donor community positions it to broker the institutional consensus that individual agencies cannot achieve alone.

This report fulfils the Phase 1 deliverable requirement under the ToR: a comprehensive system mapping report covering the four interconnected market systems, six structural drivers, and six validated leverage points. Phase 2 will translate these findings into a co-created reform roadmap, co-designed with BWDB and key stakeholders.

Annex 1 · List of participants

Institution	Designation	Sessions
IWFM-BUET	Professor	2
LGED	UE, Batiaghata	1
Water Management Committee, Dacope, Khulna	Member (WMC and UP)	2
BWDB	Research Officer	2
JICA	Program Officer	2
JICA	Advisor to BWDB	1
Abdul Monem Limited	Procurement In-Charge	1
Sushilan	Chief Executive	1
DPHE	Superintendent Engineer	1
CEGIS	Principal Specialist, BDP 2100	2
IWM	Senior Specialist, River Morphology	1
EKN	Senior Policy Advisor	1
MoWR	Deputy Secretary	1
BWDB - River Management Wing	Additional Chief Engineer	1
LGED - Integrated Water Resource Management (IWM)	Additional Chief Engineer	1
BWDB - Contract and Procurement Cell	Superintendent Engineer	1
Engineering Construction Brigade (ECB) - Bangladesh Army	Engineer in Chief (EiC) - 16th ECB	1
Development Design Consulting (DDC)	Director (Water Resource and Environment)	1
DIRD Engineering Ltd	Executive - Contract and Sales	1
Dockyard and Engineering Works (DEW), Bangladesh Navy	DGM, Engineering and Civil Works	1
Western Engineering (Pvt) Ltd.	Director (Procurement and Planning)	1
WMO Member	Polder 31	2
Local Community	Farmers	1
LGED – iwrm	Senior Assistant Engineer (Planning)	1
Asian Development Bank (ADB)	Senior Project Officer	1
World Bank (WB)	Coordinator (2030 Working Group)	1
Department of Agricultural Extension (DAE)	Director (Planning, Project Management, and ICT)	1
Uttaran	M&E Specialist, Water Governance	1
Institute for Planning & Development (IPD)	President & Consultant - ERD	1
Contractor 1 - Khulna (Paikgacha)	BWDB Enlisted Local Contractor	2
Contractor 2 - Khulna (Koyra)	BWDB Enlisted Local Contractor	1



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