



Large-tailed Nightjar

Upcoming

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- ❑ ESIA for the Rehabilitation of the Muhuri-Kahua Flood Control, Drainage, and Irrigation Project

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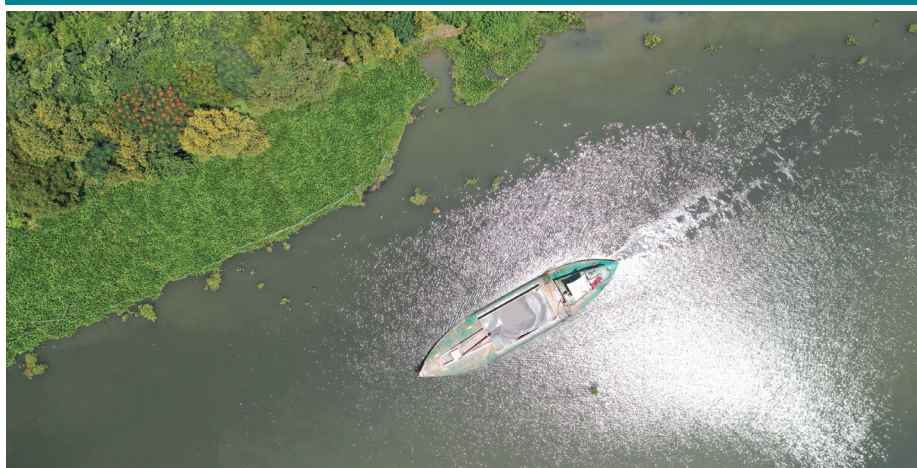
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the CEGIS NEWSLETTER

Safeguarding Environment for Future

Tracing Bangladesh's Rivers Named *Gazaria*



The Gazaria River flows through the Munshiganj District, supporting the life and livelihoods

Synthesizing findings from various historical, geographical, and cultural sources on Bangladesh's river systems, this review identifies the river Gazaria (or variants such as Gojaria/Gajaria) in multiple locations. The review highlights how shared river names reflect Bangladesh's interconnected heritage and underscores their ecological and economic importance. A total of 8 Gazaria rivers have been identified, each with district-specific nomenclature. This repetition across regions highlights Bangladesh's unified linguistic tapestry, where river names serve as threads connecting diverse communities through shared folklore and traditions.

Bangladesh's rivers are integral to its cultural and historical fabric, often bearing names that echo shared legacies across regions. The name "Gazaria" exemplifies this phenomenon, appearing in multiple locations and symbolizing the nation's

dependence on water for agriculture, fishing, irrigation, and trade along waterways. Secondary sources, including hydrological studies and regional ethnographies, supported by field surveys with local consultation, indicate that these rivers vary in size, seasonality, and utility, yet they collectively embody themes of livelihood and legacy. This study reorganizes available data to categorize and analyze these rivers based on their geographical placement and attributes.

The review identifies 8 rivers named Gazaria, distributed across different districts in Bangladesh. These findings are derived from cross-referenced secondary sources, such as government reports on riverine ecosystems, historical texts on regional geography, and field referencing with local consultation. Below is a breakdown by region, emphasizing key characteristics:

Cont'd on last page

Action Research Program (ARP) on Polders of the Future: Sustainable 'In-Polder Water Management' and Resilient Livelihood in Polder 31

Water management in the southwestern polders has been experiencing complex challenges. Residents of the polders, various governmental and non-governmental organizations, and other stakeholders have been facing these issues for many years. Despite substantial water control infrastructure in each polder, the problems have persisted over the years. The operation and maintenance (O&M) of these systems, particularly in the post-project phase, have become increasingly intricate and demanding.

In response to the above concerns and at the request of the Bangladesh Water Development Board (BWDB), the Partners for Water program in the Netherlands has partnered with CEGIS, IWM, and Uttaran to initiate an action research project (ARP). Polder 31 has been selected for this ARP, which coincides with the BWDB's current rehabilitation initiatives for the polder. This pilot project aims to institutionalize the insights gained, investigate effective strategies, and propose a more sustainable approach to breaking the Build-Neglect-Rebuild (BNR) cycle.

This initiative is critical as it directly addresses the long-standing failures within Bangladesh's polder management system. By offering an innovative solution to disrupt the persistent BNR cycle, the ARP recognizes the limitations of previous interventions and presents a promising path toward a sustainable, locally driven model.

Recognizing the Crisis: The Limitations of the Status Quo

The crisis in managing the polders is not primarily due to a lack of infrastructure alone, but to failures in governance, institutional design, and socio-political integration.

The BNR Trap: The "siloeed and business-as-usual interventions" that merely rotate within the BNR cycle. This highlights a fundamental flaw: capital investment in infrastructure (Build) is decoupled from sustainable post-project O&M (Neglect), inevitably leading to decay and the need for reinvestment (Rebuild). This cycle is economically inefficient and fails to deliver sustained benefits to the polder inhabitants.

WMOs: The Water Management Organizations (WMOs) are characterized by their "negligible positive outcomes" and "gradual un-traceability" in the post-project period. This suggests that the Guidelines for Participatory Water Management (GPWM) of 2001 and the Water Management Rules of 2014—while well-intentioned—have often led to superficial participation rather than genuine empowerment and ownership. The failure is institutional and political, where local power struggles and a top-down project mentality undermine true community engagement.

The 'Silo Lens' vs. The 'System Lens': The lack of inter-departmental/inter-ministerial coordination is perhaps the most crucial systemic failure. By treating "water" as a common public resource, the ARP correctly mandates an approach that views the polder as an interconnected socio-politico-ecological system. The existing siloeed approach, where each government

department acts independently, inevitably leads to fragmented planning, conflicting priorities, and a failure to manage the essential trade-offs required for holistic water management.

The Critical Opportunity: An Action Research Approach

The ARP's methodology—supported by the Netherlands Enterprise Agency and executed by CEGIS, IWM, and Uttaran—provides the critical framework necessary to address these failures.

Co-Creation and Co-Implementation: The commitment to actively involve all relevant stakeholders (from local people to ministries) in co-designing and co-implementing solutions is a paradigm shift. This moves beyond mere 'consultation' to a process of shared learning and shared responsibility. This action research model (investigating problems while simultaneously implementing solutions) is crucial for generating a model that is technically sound and socio-politically feasible.

Learning Questions as a Roadmap: The ARP focuses on the critical learning questions, targeting the core of the problem:

Diagnosis

Asking "Why have past interventions not been sustainable?" and exploring power dynamics, community ownership, and policy gaps correctly frames the problem as more than just a technical challenge.



Prescription

Asking "How can we establish a well-functioning and locally owned institutional model?" mandates the creation of a durable, context-specific governance structure rather than a mere temporary project body.



Action

Asking "What are the most feasible, impactful, and scalable interventions that can be piloted now?" ensures the research is practically guided and directly linked to the implementation timeframe.



The strategy of conducting the BWDB polder rehabilitation program as a pilot program for the ARP's learnings is highly strategic. The ARP for Polder 31 is an important and timely project that effectively identifies the problems with the BNR cycle. It focuses on co-creation, systems thinking, and institutional reform rather than solely on technical solutions. This approach can create a model for sustainable water management and resilient livelihoods in vulnerable polder areas of Bangladesh. The key challenge will be to ensure that the lessons learned become part of a locally-owned, fairly financed, and politically supported framework that lasts beyond the project's duration.

Muhammad Shifuddin Mahmud
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Contract Signing for Different Studies

During the 3rd quarter of the year 2025 (July to September), CEGIS has signed notable 12 (Twelve) contracts with different organizations and clients. The contract titles with clients and dates of signing are given below:

- i) Consultancy for Identifying Indicators Responsible for Climate Change Impacts to Develop Climate Risk Index, Interactive Knowledge Hub Project" with Oxfam GB on 01-Jul-2025;
- ii) "Climate-Smart Agricultural (CSA) adaptation in selected climate vulnerable areas of Bangladesh: Reviewing technology, variety and practices" with Planning Commission on 17-July-2025;
- iii) "Identification of Nature-Based Solutions (NbS) for incorporation in Future PBCRG Schemes following NAP and Integration of NbS within Local Government Division (LGD) Institutions (LGIs)" with United Nations Development Program (UNDP) on 31-July-2025;
- iv) "ESIA on Construction of Temporary Solid Waste Management Facility for Teknaf Camps in Camp 26" with United Nations Development Program (UNDP) on 24-August-2025;
- v) "Study on Livelihood and Integrated Management of Land and Water Resources in Chalan Beel Area with a View to Restoring Chalan Beel" with Bangladesh Haor & Wetland Development on 27-August-2025;
- vi) "Feasibility Study for LOGIC - Phase 2" with United Nations Development Program (UNDP) on 04-September-2025;
- vii) "Feasibility Study on Livestock Service Transformation (LST) Project" with Department of Livestock (DLS) on 17-September-2025;
- viii) "Update, Installation & Configuration of ArcGIS Enterprise (4 Core, Perpetual), update ArcGIS Pro

Advance to the latest version and Conversion of 33 KV GIS Data to WebGIS Portal Using Windows Server (16 Core, 2 Nos.)- including On-Job Training" with Bangladesh Rural Electrification Board (BREB) on 18-September-2025;

- ix) "Technical assessment of anthropogenic impacts on delta landscapes to identify a NBS" with World Bank Bangladesh on 18-September-2025;
- x) "Feasibility Study of Barishal-Jajira-Mawa-Aminbazar Gas Transmission Pipeline Project" with Gas Transmission Company Ltd (GTCL) on 25-September-2025;
- xi) "Maintenance dredging through optimization all over Bangladesh for the year 2025-26" with Bangladesh Inland Water Transport Authority (BIWTA) on 29-September-2025;
- xii) "Feasibility Study of Sirajganj EPZ" with Bangladesh Export Processing Zones Authority (BEPZA) on 30-September-2025.



Mr. Kazi Hassan Masud, Company Secretary (General Manager), Gas Transmission Company Limited (GTCL) and Mr. Malik Fida A. Khan, Executive Director of CEGIS with other professionals from both organization were present in the contract signing ceremony on the Feasibility Study of Barishal-Jajira-Mawa-Aminbazar Gas Transmission Pipeline Project with GTCL on 25 September 2025

The Large-tailed Nightjar: The Silent Bird of the Night



In the dense forests and bamboo groves of the different regions of Bangladesh, one may occasionally come across a mysterious nocturnal bird — the Large-tailed Nightjar (*Caprimulgus macrurus*). Recently, at the National

Botanical Garden, this elusive bird was spotted resting on a bed of dry bamboo leaves. At first glance, it was nearly invisible, perfectly camouflaged against the forest floor — a true marvel of nature's disguise.

The bird's physical appearance is uniquely adapted to its environment. It has a mottled brown, grey, and black plumage that blends seamlessly with the leaf litter. The bird's large, reflective eyes are key to its nocturnal hunting, while its relatively long tail provides the necessary stability for silent, gliding flight. Perhaps its most striking feature is its feeding apparatus: a surprisingly small beak that opens

into a wide mouth, designed like a specialized net to scoop flying insects—moths, mosquitoes, and beetles—out of the air mid-flight. This feeding behavior makes it an important natural controller of insect populations, indirectly benefiting nearby agriculture.

The species' breeding habits are equally tied to camouflage. Between March and August, the female lays two eggs directly on the ground, bypassing the construction of a traditional nest. Both the eggs and the newly hatched chicks possess cryptic patterning, ensuring maximum concealment from predators.

Though not commonly seen, this species does occur in Bangladesh's forested habitats. Protecting such environments is vital for the survival of unique species like the Large-tailed Nightjar. More than just a silent bird of the night, it plays a quiet but significant role in maintaining the natural balance of our ecosystem.

Sharif Tanver Ahammad
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Scoping Study on Integrated Water Resources Management and Climate-Resilient Public Services in Naogaon and Satkhira, Bangladesh

Urgent Challenges in IWRM in Bangladesh

Bangladesh, despite its notable progress in development, is currently facing an urgent and escalating challenge in water resource management due to the intensifying impacts of climate change. Issues such as salinity intrusion, groundwater depletion, erratic rainfall, and recurrent flooding are disproportionately affecting rural and climate-vulnerable communities. The responsibility for delivering climate-resilient water services in these areas often rests with Local Government Institutions (LGIs), which frequently operate with constrained resources and limited institutional capacity.

GO4IMPact Programme Overview

In response to these interconnected challenges, the GO4IMPact Programme, a significant initiative in the field of water resource management, led by WaterAid Bangladesh and Swisscontact, with support from the Swiss Agency for Development and Cooperation (SDC), has launched a five-year Integrated Water Resources Management (IWRM) planning initiative in Naogaon and Satkhira districts. Covering 39 unions and 2 Paurashavas across four upazilas, the programme aims to strengthen local water governance, enhance infrastructure resilience, and ensure inclusive, climate-adaptive water service delivery.

Study Objectives and Methodology

The study was designed with a comprehensive approach, aiming to:

- Assess the condition and resilience of existing IWRM infrastructure.
- Analyze sectoral water use and future demand.
- Review institutional and policy frameworks.
- Formulate strategic, climate-resilient interventions tailored to local realities.

A mixed-method approach was adopted, integrating field surveys, infrastructure audits, GIS-based hydrological modeling, and participatory tools, including Focus Group Discussions (FGDs) and Key Informant Interviews (KIIs). Data were collected via KoboToolbox and analyzed using Python-based tools. A stakeholder mapping exercise identified 28 key actors, with DPHE, BWDB, LGED, BADC, BMDA, and Union Parishads flagged as high-influence stakeholders. The process aligned with national frameworks, including the Bangladesh Delta Plan 2100, National Adaptation Plan, and SDG 6.5.1 on water governance.

District-Specific Context

The planning process recognized the distinct ecological and socioeconomic characteristics of Naogaon and Satkhira districts:

Naogaon: A drought-prone district with declining groundwater, relies heavily on deep and shallow tube wells to support intensive agriculture.

Satkhira: Faces coastal hazards such as salinity, tidal flooding, and cyclone exposure. Its residents depend on surface water, rainwater harvesting (RWH), and brackish aquaculture, making water access highly sensitive to climate variability and seasonal change.

Despite their differences, both districts are experiencing water stress due to population growth, climatic shifts, and infrastructure gaps.

Key Findings

Water Access and Governance

- Naogaon households experience fewer water access challenges, but institutional water governance remains weak.
- In Satkhira, women face greater barriers to access, and formal community water management systems are lacking despite active informal participation. This highlights the scope for more inclusive, community-driven governance.

Agricultural Water Demand

- Naogaon has a significantly higher agricultural water demand, reaching 547.99 Mm³ annually, driven by intensive Boro and Rabi farming through BMDA-supported irrigation.
- Satkhira requires more adaptive approaches due to its saline-prone soils, with aquaculture consuming the bulk of water at 618.30 Mm³/year.

Infrastructure Assessment

- Most water control structures in Naogaon are functional. However, cyclone-affected areas in Satkhira, such as Gabura and Munshiganj, have widespread non-operational systems.
- Desiltation, retrofitting, and community-led maintenance are vital for future resilience.

Hydrological Modeling Insights

Hydrological models suggest

Naogaon: Will maintain a relatively stable water balance through 2050.

Satkhira: Faces increasing surface water stress due to salinity intrusion and low recharge rates, necessitating strategic investments in water retention and desalination solutions.

Water Technology Utilization

Satkhira employs Pond Sand Filters (PSF), Reverse Osmosis (RO), and Rainwater Harvesting (RWH) to counteract salinity in drinking water.

Naogaon lacks such systems but requires investment in aquifer management and canal rehabilitation.

Climate-resilient tailored approach

A climate-resilient and tailored approach is essential for managing water resources in Bangladesh, particularly

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Scoping Study on Integrated Water Resources Management ... (Cont'd from page 4)



Water structure (left) and FGD (right) in the study area

due to the country's varied climatic and geographical conditions. For instance, the Satkhira district faces significant water shortages during the dry season, which poses challenges for agriculture and community water supply. Conversely, Naogaon benefits from a relatively stable groundwater supply, but this does not remain consistent throughout the year.

To effectively address the unique challenges of these regions, targeted interventions are necessary. In Satkhira, strategies like developing rainwater harvesting

availability of its resources.

By adopting these customized strategies, both districts can enhance their resilience to climate variability and secure reliable access to water, ultimately supporting local livelihoods and improving community well-being.

systems, promoting drought-resistant crops, and enhancing irrigation infrastructure could help optimize water usage during critical dry periods. Meanwhile, Naogaon should focus on sustainable groundwater extraction practices and water conservation measures to ensure the continued

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Water Sample Digestion for Metal Detection with UV-1800 Spectrophotometer at CEGIS LAB

Water sample preparation is crucial for metal analysis, which needs digestion for experimental research to purify water to be tested. Cautions should be taken when working with acids and chemicals. All chemical work for sample digestion should be done in a fume hood or a well-ventilated area to protect against fumes. For sample digestion, a stirrer & a hot plate and a fume hood are used at CEGIS LAB. A hot plate and stirrer are used for heating



water samples, and a fume hood is used for mixing acids and chemicals with samples & their reaction in it. A fume hood works to produce air inside it and to remove the chemical fumes generated outside by the exhaust pipe. A stirrer and hot plate are general-purpose heating and

stirring devices for laboratory procedures requiring precise control of temperature and stirring speed. Its model is MS300HS, max temperature 3800 °C, Power consumption 695W, stirring speed 100-1500 rpm and Power supply 220 VAC 50/60 Hz. It has a ceramic-coated top plate which is corrosion-proof, temperature-resistant and resists aggressive fluids. The device uses an electronic analogue temperature controller to control temperature- In CEGIS LAB, Digestion of water samples is done in the following way:

- 100 ml of well mixed acid preserved collected water sample is to be taken into a cleaned and sterile beaker using cleaned and sterile measuring cylinder-
- 2 mL of concentrated HNO₃ + 5 mL of concentrated HCl or 2 mL concentrated HNO₃ is to be added to the beaker sample using a cleaned glass pipette, a pump/accurate laboratory micropipette.
- Then the beaker with the acid mix sample is to be placed on the stirrer hot plate at 90 to 95°C using the device temperature control knob.
- Then the heater power is to be turned on by connecting the power cable in the main line, and by continuous heating, the volume is to be reduced up to 10-20 ml.
- After that, the heater power is to be turned off and the temperature power control knob should be in

Cont'd on page 7

Safeguarding Bangladesh's Forests: Integrated Collaborative Forest Management Plans

Bangladesh's forest ecosystems ranging from Sal woodlands to coastal mangroves are vital pillars of biodiversity, climate resilience, and community livelihoods. Despite their importance, these resources are under increasing pressure from deforestation, illegal logging, land encroachment, and the escalating climate crisis.

With these challenges growing, the Center for Environmental and Geographic Information Services (CEGIS) has developed Integrated Collaborative Forest Management Plans (ICFMPs) for the Forest Department under the SUFAL Project.

The ICFMPs are characterized by their integration of biophysical, social, and wildlife data. By synthesizing field-based ecological surveys with community needs assessments, these plans move beyond theory into landscape-specific action. The surveys use a robust methodology to ensure data accuracy and reliability (see below). This data-driven approach ensures a sustainable balance between preserving ecological integrity and supporting forest-dependent populations.

Bangladesh's diverse forest ecosystems are currently facing critical threats that require tailored, localized interventions. However, under the SUFAL Project, this ICFMP initiative covers the following regions:

- Dhaka's Sal Forests: Currently strained by rapid urban growth and unsustainable overharvesting, these forests require urgent restoration through



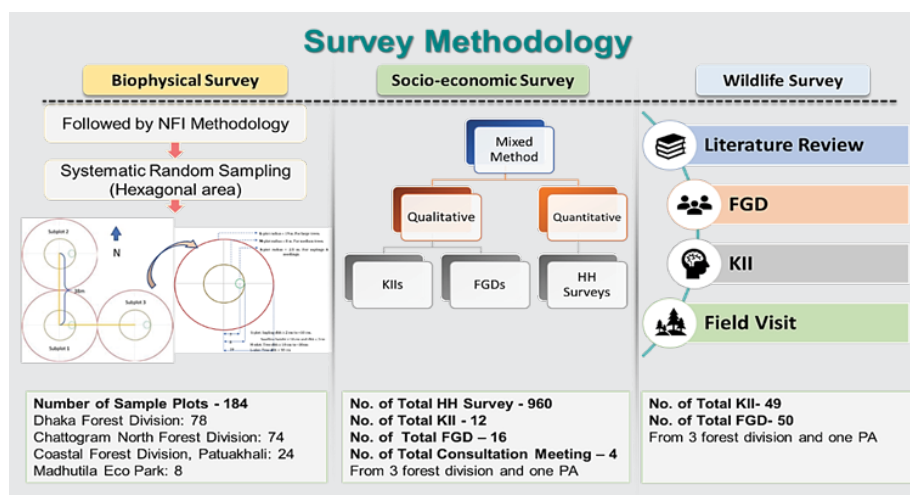
Biophysical Survey Training

active community-led stewardship to reclaim degraded land.

- Chittagong North Hill Forests: Persistent encroachment threatens this biodiversity hotspot. The challenge lies in implementing spatial planning that protects ecological integrity while supporting forest-dependent livelihoods.
- Patuakhali Coastal Mangroves: As a frontline defense against climate change, these forests are under siege from rising salinity and the expansion of

aquaculture. Success here requires adaptive, nature-based solutions to ensure long-term resilience.

- Modhutila Eco Park (Sherpur): This protected area faces a complex dual responsibility: On one hand, it aims to attract visitors by showcasing its rich



biodiversity and unique ecosystems, offering opportunities for sustainable tourism benefiting both the local economy and environmental awareness. On the other hand, it must implement comprehensive conservation strategies to protect elephants, including habitat preservation and meaningful community involvement.

To address these challenges, the Integrated Conservation and Forest Management Plans (ICFMPs) provide a cohesive but flexible framework. This strategy shifts away from traditional top-down management toward a modern, inclusive model built on three pillars:

- Collaborative Governance: Actively engaging forest officials, local institutions, and community members.
- Scientific & Digital Management: Integrating tools like the SUFAL SSP digital platform to monitor forest health and streamline social forestry programs.
- Climate Resilience: Designing interventions that restore ecosystems while diversifying livelihoods to reduce human pressure on forest resources.

Through this integrated approach, the ICFMPs aim to revitalize Bangladesh's forest cover and secure a sustainable future for the communities that depend on them.

Md. Naif Ahmed Chowdhury
Ecology, Forestry and Biodiversity Division

SIQMS and CEGIS Sign Memorandum of Understanding to Advance Geospatial Technology and Capacity Building

Dhaka, Bangladesh — July 2, 2025 — The Center for Environmental and Geographic Information Services (CEGIS), Bangladesh, and the Spatial Information Quality Management Service (SIQMS), South Korea, have signed a Memorandum of Understanding (MOU) to foster cooperation in spatial data quality management, remote sensing, and geographic information systems (GIS).

- The signing ceremony took place at CEGIS Bhavan in Agargaon, Dhaka. The MOU was formally signed by Malik Fida A. Khan, Executive Director of CEGIS, and Hyung-kyo Jung, President of SIQMS, on behalf of their respective organizations.
- SIQMS is a government agency under the Ministry of Land, Infrastructure, and Transport specializing in spatial data quality verification and performance audits. This strategic partnership aims to promote sustainable development and technological advancement by integrating the complementary expertise of both organizations in geospatial analysis and quality assurance.
- Key areas of collaboration include exchanging methodologies for survey verification and data accuracy assessment; applying UAVs, satellite imagery, and photogrammetry for environmental and land-use monitoring; and developing GIS-based platforms to support policy formulation



The MoU is signed by Mr. Hyung-kyo Jung, President of SIQMS (left), and Mr. Malik Fida A. Khan, Executive Director of CEGIS (right)

and spatial planning. The MOU also emphasizes capacity building through technical workshops, training programs, and expert exchanges to strengthen human resources in spatial information quality management.

- Both organizations will jointly develop an action plan outlining specific projects, roles, and implementation timelines. This collaboration marks a significant milestone in advancing modern land management and surveying practices in Bangladesh through the adoption of innovative geospatial technologies.



High officials and experts from DoE, Forest Department, LGED, PGC, SIQMS, and CEGIS were present in the ceremony

Cleaning and Sterilization ... (Cont'd from page 5)

- the zero setting position.
- The beaker is to be removed, and it should be cooled.
- All the above works should be done in the fume hood in an ON condition.
- The beaker is to be washed down with deionized water (3 times) during filtering.
- The final cooled sample is to be filtered through a Whatman filter paper no. 42/others, (if any) using cleaned and sterilized glass funnel.
- Finally, the sample is to be poured into cleaned, sterilized 100 ml volumetric flask and to make it up to 100 ml.
- After that, the digested sample is to be mixed thoroughly and to be poured into a cleaned sterilized HDP bottle and kept in the refrigerator for analysis later or it can be used for analysis in the same time.

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Tracing Bangladesh's Rivers Named Gazaria ... (Cont'd from page 1)

Gajaria Rivers in Northeastern Bangladesh (Mymensingh, Sunamganj, Netrokona, and Habiganj)

- These 4 rivers are small, seasonal streams primarily fed by monsoon rains.
- Key Attributes: They swell during the wet season, supporting agriculture (e.g., rice fields) and fisheries, but recede significantly in dry periods, rendering them non-navigable.
- Socio-Economic Role: These rivers are crucial to local village life, providing water for irrigation and small-scale fishing. However, their intermittent flow poses challenges for year-round use, highlighting vulnerabilities in monsoon-dependent economies.

Gajaria Rivers in the Northwestern Bangladesh (Gaibandha and Bogura)

- 2 rivers in this region are linked to the Korotoya-Ichamati river system.
- Key Attributes: The longer one spans approximately 35 kilometers through Gaibandha and Bogura, while the shorter forms a 5-kilometer loop in Bogura. Both are seasonal, with reduced flow outside the monsoon.
- Socio-Economic Role: Historical trade-route analyses indicate that these rivers once facilitated commerce, though their navigability has diminished. However, recent observations noted their Role in supporting local agriculture and livelihoods.

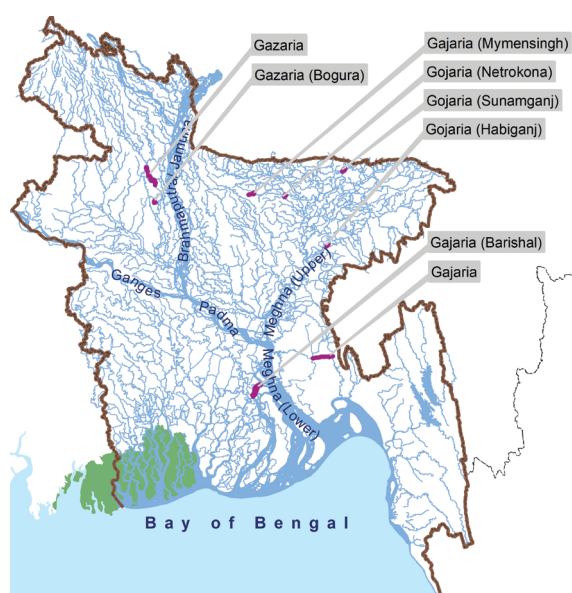
Gajaria River in Southeastern Bangladesh (Cumilla)

- The Gajaria River in Cumilla merges with the Old Dakatia River.
- Key Attributes: Influenced by tidal forces from the Meghna estuary, it exhibits a dynamic flow pattern affected by both rainfall and sea levels.
- Socio-Economic Role: environmental observations emphasize its Role in local ecosystems, aiding in flood management and supporting biodiversity.

Gajaria River in South-Central Bangladesh (Barishal)

- The Gajaria in Barishal is the most prominent among the 8 of its name.
- Key Attributes: Unlike the others, it is perennial, with an average width exceeding 1 kilometer, and classified as a Class-I navigable river.
- Socio-Economic Role: Literature review, including transportation surveys, describes it as a vital artery for launches, cargo vessels, and fishing boats, connecting close regions to national waterways and facilitating trade.

The rivers named 'Gazaria' in different locations serve as a metaphoric reflection of Bangladesh's vast water landscape. They embody not only the region's rich historical narrative but also illustrate the intricate ecological systems and vibrant local cultures. This review focuses on their diverse roles, including support for agriculture and navigation, and highlights the natural environment and cultural heritage along their banks.



All Gazaria Rivers Across the Country showing in Map



From place to place, the Gajaria River reveals a new story across Bangladesh (Internet)

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