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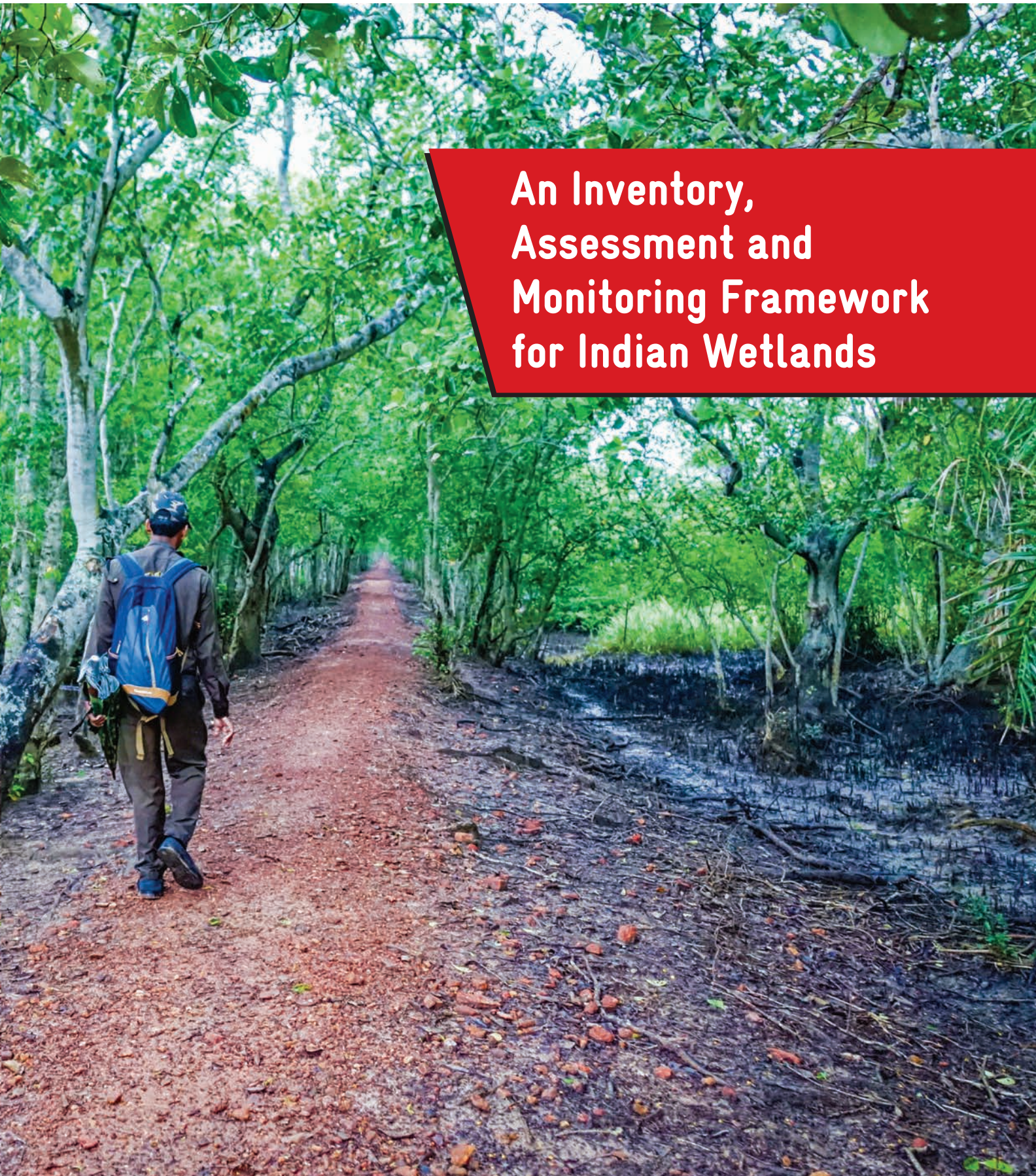

An Inventory, Assessment and Monitoring Framework for Indian Wetlands

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Foreword

Wetlands are one of the most productive ecosystems in the world. Healthy wetlands deliver a wide range of ecosystem services, providing water, food and livelihoods to millions of people. They support rich biodiversity and serve as buffers against disasters and adverse climate risks. However, as per the *Global Wetland Outlook*, 35% of the wetlands have been lost globally since 1970, a rate three times faster than loss of natural forests.

In India, wetlands constitute 4.6% of its total geographic area, spanning across 15.26 million hectares. India is party to the Ramsar Convention on Wetlands since 1982 which recognizes the need for conservation and wise use of wetlands. Further, India's Wetland (Conservation and Management) Rules (2017) and National Plan for Conservation of Aquatic Ecosystems (NPCA) provide a regulatory framework and guidance on conservation and sustainable use of wetlands in India.

NPCA guidelines stipulate preparation of integrated management plans (IMP) based on systematic diagnosis of various wetland features and influencing factors. This wetland inventory, assessment and monitoring framework contextualises and merges the Ramsar WIAMS framework with the systematic diagnosis required for preparing IMPs under the NPCA.

I congratulate the 'Wetlands Management of Biodiversity and Climate Protection' project for preparing a 'An Inventory, Assessment and Monitoring Framework for Indian Wetlands', and I hope it will be useful for the site managers. I encourage wetland managers to test and apply this framework at their sites and provide feedback.

(Manju Pandey)

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Introduction

Wise use of wetlands entails participatory management and conservation decisions made with recognition of the importance of ecosystem services provided by wetlands. By recognizing the human interdependency with wetland functioning, wise use accommodates sustainable utilization of these ecosystems in a way compatible with the maintenance of natural properties of the ecosystem. The onus of elaborating a pathway for achieving wise use outcome is on the management planning process which considers full range of wetland components and related services, and the underlying processes that enable delivery of these services.

The Ministry of Environment, Forest and Climate Change, under the National Plan for Conservation of Aquatic Ecosystems (NPCA) has formulated guidelines for preparing integrated management plans (IMP) for wetlands. The guidelines prescribe a diagnostic and participatory evaluation of wetlands in order to define management framework and specific actions for achieving wise use of wetlands (Figure 1).

The Wetland Inventory, Assessment and Monitoring System (WIAMS) framework of Ramsar is an internationally recognised tool that aids decision-making for ecosystem-based management of wetlands. It also supports integration of ecosystem services within the integrated management planning process, as also emphasised by the NPCA.

The NPCA guidelines for preparation of IMP comprise eight steps, starting from setting a preamble to developing an action and financing plan (Figure 2). A site manager will require basic level of information and knowledge to undertake each of these steps. WIAMS can assist site managers in preparation of an IMP most effectively. While inventory feeds into description of wetland features by creating a baseline dataset, assessment assists in the evaluation of wetland features and institutional arrangements through identification of drivers and pressures of change. This establishes the status, trends and priority features for management that enable setting of management objectives. Additionally, monitoring indicators provided under WIAMS assist in developing a monitoring plan for management, including measuring effectiveness of management.

As a step towards streamlining the WIAMS framework in the context of Indian wetlands, an expert consultation was organised in New Delhi on

Figure 1: Components of integrated wetland management planning (Adapted from NPCA guidelines, 2019)

Figure 2: Role of WIAMS in development of integrated management plan

23-24 July, 2019[1]. The purpose of the consultation was to review the available Ramsar WIAMS frameworks for incorporation within the management planning process and recommend a WIAMS framework for management of wetlands in India.

The consultation helped in building an integrated WIAMS framework in Indian context for gathering information for management of wetlands. It helped in determining the parameters which need to be inventoried, assessed and monitored for each wetland feature including - extent, catchment, hydrology, biodiversity and ecosystem services, livelihoods, and institutions and governance. Taking into consideration the insufficient knowledge base available to the wetland managers in India as well as inadequate resources available with them for wetland management, these parameters were prioritised as essential based on following five criteria -

i. Relevance for integrated management
ii. Practicality
iii. Cost-effectiveness
iv. Time
v. Resource availability

These essential parameters would help the wetland managers understand the ecological character of the wetland, define management objectives and prioritise actions.

The following section presents the WIAMS framework contextualised for Indian wetlands for integrated wetland management.

[1]**Establishing a Wetlands Inventory, Assessment and Monitoring Framework for Indian Ramsar Sites: An Expert Consultation, 23-24 July 2019, New Delhi**

Participants: Prof. Max Finlayson (Charles Sturt University), Dr. Stefan Schneiderbauer (UNU-EHS & Eurac Research), Dr. Ajit Kumar Pattnaik (Former PCCF, Odisha, CDA), Dr. S. Balachandran (BNHS), Prof. Dr. Ramesh Ramachandran (NCSCM), Prof. E.J. James (Karunya University), Dr V. Selvam (MSSRF), Prof. Dr. B.C. Choudhury (WTI), Prof. Dr. J.K. Garg (TERI), N. Venkatesan (Dhan Foundation), Mr. Durga Prasad Dash (Pallishree), Dr Vivek Saxena (IUCN), Dr A.K. Gosain (IIT Delhi), Mr. Gurdeep Rastogi (CDA), Dr. B.C Jha (CIFRI), Prof. Dr. L. Venkatachalam (Madras Institute of Development Studies), Mrs. Nisha D'Souza (EcoNiche), Mr. Siddharth Patil (ACWADAM), Dr. Ritesh Kumar (WISA), Dr. Ridhi Saluja (WISA), Mr. Harsh Ganapathi (WISA), Mr. Dhruv Verma (WISA), Mr. Ravindra Singh (GIZ), Dr. Avantika Bhaskar (GIZ), Mr. Kunal Bharat (GIZ), Mr. Debojyoti Mukherjee (GIZ), Ms. Patricia Dorn (GIZ), Ms. Neha Owaisy (GIZ)

Wetland Inventory, Assessment and Monitoring Framework

The wetland inventory, assessment and monitoring system (WIAMS) forms the foundation for effective integrated wetland management. WIAMS serves as an overarching framework that defines the core information base required to describe the site, set management objectives, and establish monitoring indicators. The framework supports the fundamental principles of wetland management including catchment scale management, water flow, spatial and temporal connectivity, representativeness and irreplaceability, and maintaining natural integrity and resilience.

Inventory, assessment and monitoring are not separate activities, rather form a continuum of information generation guided towards effective diagnosis of factors leading to adverse change in wetlands, and the pathways for limiting and reversing adverse change. Inventory provides information for assessment which provides information for monitoring with feedback to inventory and/or assessment. Additionally, WIAMS provides feedback for management actions and the necessary information to support adaptive management. Adaptiveness should also be reflected in the information needs for management, whether more data is required and for adjusting the monitoring programme (Figure 3).

An assessment of ecological, hydrological, socioeconomic and institutional features of the wetland, and factors governing these features to define management objectives and actions form the core of WIAMS.

The technical and financial resources available to the wetland managers seldom correspond to the requirements of a comprehensive WIAMS. The site managers often encounter conditions of – low data

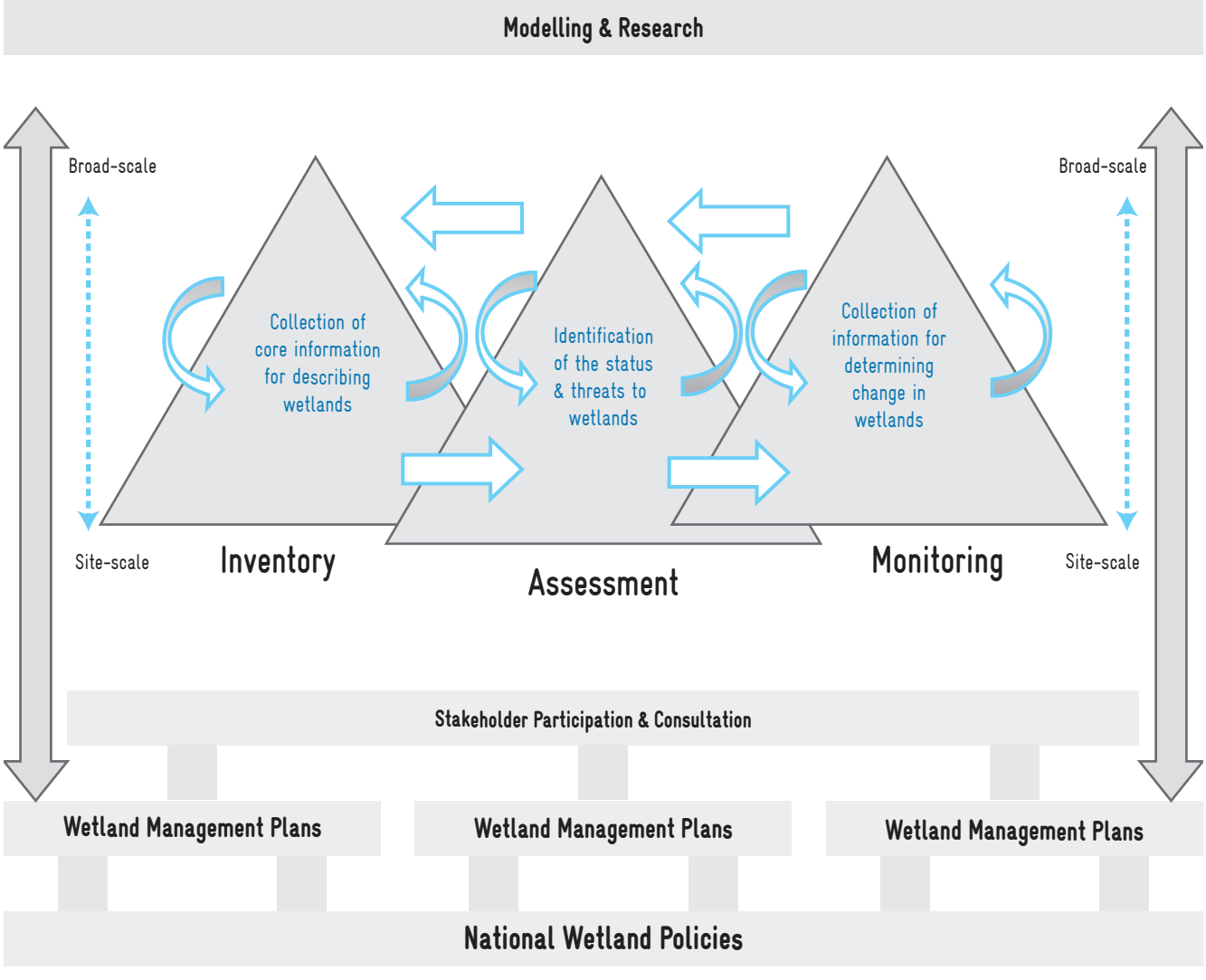

Figure 3: WIAMS Framework (Max Finlayson)

and low resource, while developing integrated management plan. Therefore, WIAMS in the Indian context needs to be based on identification and prioritization of core information needs for guiding management planning and wise use of wetlands.

Wetland managers often have limited technical and financial resources. This requires WIAMS to be practical in terms of management, that is, assessments should be management-oriented and not merely research-oriented. Additionally, the methods and techniques used for inventory, assessment and monitoring need to correspond to the available resources with site managers.

The following tables enlist the parameters and corresponding indicators for inventory, assessment and monitoring.

Working definitions for wetland inventory, assessment and monitoring incorporated into Ramsar's Framework for Wetland Inventory (Resolution VIII.6):

- **Wetland Inventory:** the collection and/or collation of core information for wetland management, including the provision of an information base for specific assessment and monitoring activities.
- **Wetland Assessment:** the identification of the status of, and threats to, wetlands as a basis for the collection of more specific information through monitoring activities.
- **Wetland Monitoring:** the collection of specific information for management purposes in response to hypotheses derived from assessment activities, and the use of these monitoring results for implementing management.

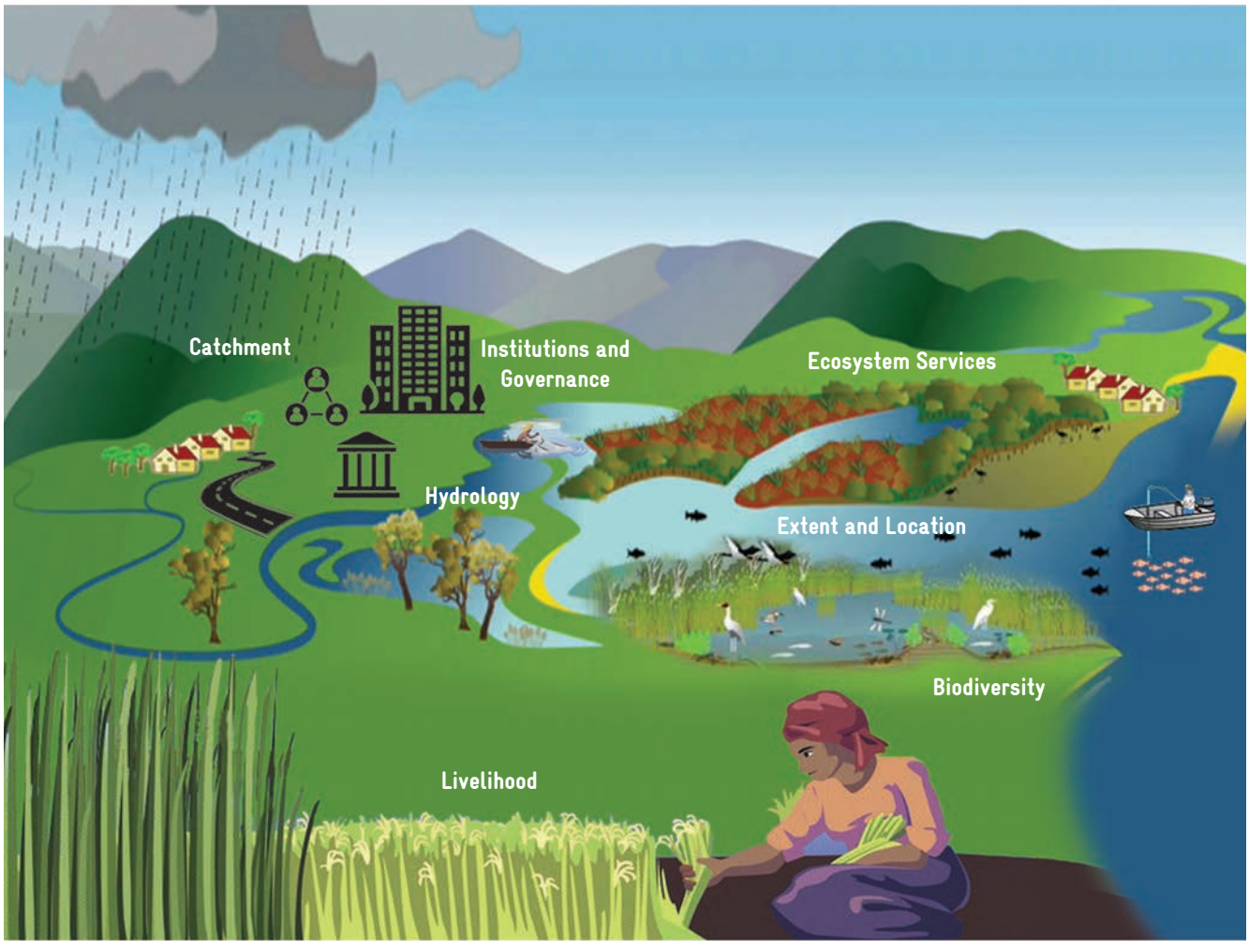

Figure 4: Illustration showing wetland features – (i) Location and extent, (ii) Catchment and hydrology, (iii) Biodiversity, (iv) Ecosystem services and livelihood, (v) Institutions and governance

Extent

Wetland extent can be defined as the spread or size of the wetland. It is usually defined based on indicators such as inundation (permanent or intermittent), presence of hydrophytes, or hydric soils. Wetland extent delineation can be challenging as they vary in landcover from some having open water to vegetation dominated. Additionally, wetlands are also highly variable in spatial extent as the inundated area fluctuates seasonally and with varying environmental conditions.

Guiding question for wetland managers

Why is it important to determine wetland location and extent for management?

Determination of wetland extent helps to define the geographical scope of management. Extent mapping is necessary in order to track wetland loss, assess wetland condition effectively and identify areas requiring management interventions.

INVENTORY		ASSESS		MONITOR	
• Define wetland boundary consistently		• Is the extent changing? • Drivers of change of wetland extent • Impacts of change in wetland extent		• Where and how much is the change in wetland extent?	
Parameter	**Indicator**	**Parameter**	**Indicator**	**Parameter**	**Indicator**
Ecological boundary and area	• inundation (a normal precipitation year) and/or • hydrophytic vegetation	Change in extent of wetland over a period of time	• inundation regime • vegetation (change to non-wetland use)	Extent of change in wetland area	• interannual variation in inundation regime • vegetation cover • encroachment • shoreline change
Boundary defined by law and regulation	• Protected Area • Ramsar site • notified wetland by State Wetland Authority	Drivers of change- proximal and distal	• regulatory framework • local climatic conditions • land use change/ development activities • biological changes in the wetland (e.g. grazing, invasive species) • pollution load • hydrological changes (e.g. desilting) • resource extraction • management interventions	Shoreline change	
Administrative location	• rural/urban • forest/non-forest • national/ state/ district/ village			Degree of fragmentation	infrastructure development (such as road or power transmission lines) or other land use within wetland such as agriculture
Bio-geographic location of the wetland					
Ownership					
Wetland type	• 42 Ramsar categories* • National Wetland Atlas**				
Land use land cover within the wetland	percent cover of land use classes				

* Explanatory Note and Guidelines for completing the Information Sheet on Ramsar Wetlands (RIS) Annex I: Ramsar Classification System for Wetland Type

** National Wetland Atlas, SAC/EPSA/ABHG/NWIA/ATLAS/34/2011, Space Applications Centre (ISRO), Ahmedabad, India, 310p.

Catchment and Hydrology

A wetland catchment is defined as the region which drains into the wetland. Catchment area of a wetland influences wetland's hydrological regimes and key processes such as nutrient enrichment and sedimentation. A description of hydrological regimes is based on water and sediment inflow and outflow patterns, inundation, bathymetry, quality and use within the basin. An assessment of water inflow and outflow and water balance indicates the water that is stored in the wetland, and provides information on hydrological functioning, including flood control and groundwater recharge. It also indicates water availability for human as well as ecosystem processes. The sediment flux influences ability of wetland to support various functions, such as moderate hydrological regimes, recharge groundwater, and purify water.

Guiding question for wetland managers

Why is wetland catchment and hydrology important for wetland management?

Wetland catchment is the source of water (quality and quantity), nutrients and sediments in the wetland, while the status and movement of water in the wetland provides the physical template on which the wetland evolves and functions. Well-managed catchments ensure sustainable water supply, reduced sediment load and healthy wetlands that contribute to provisioning of multiple ecosystem services and benefits. Headwater wetlands provide water resource functions like flood regulation, while downstream wetlands provide local goods and services such as fish, agriculture and recreation.

INVENTORY

- Identify and locate the sources of water
- Demarcate zone of direct and indirect influence
- Map what exists within the catchment

Parameter	Indicator
Catchment boundary and area	catchment area
Geomorphic settings / features • Topography • Location within the catchment	 • elevation, slope, aspect • headwater, riparian, delta
Land use and land cover in direct catchment	percent area under forest, built-up area, agriculture and settlements, and development activities
Hydraulic structures in direct inflows and outflows in direct catchment	location, number of structures, type, length of drainage affected, dams (volume, operation)
Climatic settings in catchment- precipitation, temperature	inter-annual variability in climatic parameters
Springshed (for spring- fed wetlands)	boundary and area
Water depth profile	bathymetric profile
Storage capacity in freshwater wetlands	bathymetry/ wetland volume
Inflows into the wetland • Number of inlets • Water quality • Number of springs (for spring-fed)	• perennial/non-perennial, relative contribution, types, seasonality • Dissolved Oxygen (DO) and Chemical Oxygen Demand (COD)
Outflow • Number of outlets • Seasonality	
Water quality in the wetland • Physical parameters • Chemical parameters • Biological parameters	• transparency, temperature • pH, DO, COD, nutrient status, salinity (coastal wetlands) • total coliform (drinking water supply)
Sediment load	sediment load
Water abstraction (direct) • Quantity • Seasonality	 • number of abstraction structures (e.g. borewells), purpose of abstraction
Hydraulic structures within the wetland and inflow and outflow points	number, type and size, operation
Seasonal hydrological connectivity	rivers, coasts, wetlands

ASSESS		MONITOR	
• Changes in the catchment impacting the wetland- short and long term • Why is the hydrology changing? • Where are the drivers of change located?		• Monitor the causes of change	
Parameter	**Indicator**	**Parameter**	**Indicator**
Impact of land use conversion on wetland features	development activities, river course, hydraulic structures, cropping pattern	Changes in drainage pattern in the catchment	alteration in inflows and outflows
Impact of extreme events (flooding, landslides, forest fires, glacial lake outburst flood, cyclone)	hazard mapping, vulnerability assessment	Changes in LULC in the catchment and wetland	changes in LULC over a period of 2-5 years
Impact of pollutants from industries/ agriculture/ grazing/ urbanisation on wetland	water quality	Change in groundwater level in the catchment	seasonal groundwater levels
Impact of changing water use pattern within catchment on wetland hydrology (quantity and quality)	water use within the catchment	Development activities in the catchment	identify location where these activities are proposed
Changes in climate (including modelling data)	changes in temperature, precipitation etc.	Water level in the wetland	seasonality
		Water storage (especially for reservoirs)	seasonal variations in storage
		Water quality	pollutants, nutrients
		Hydrological connectivity with rivers and coastal rivers	status/condition of inflows and outflows
		Ground water level in the wetland	seasonality
		Inflow and outflow	quantity and quality
		Sources of pollution	location and character of point and non-point sources of pollution
		Tidal regime (coastal wetlands)	tidal flows – quantity

Biodiversity

Biodiversity is the diversity among living organisms in terrestrial, marine, and other aquatic ecosystems and the ecological complexes of which they are part. Wetlands are unique ecosystems that support high biodiversity encompassing all the trophic levels and including endemic and rare species. Biodiversity is an important component of wetland ecosystem which is related to ecosystem functioning as well as services.

It is important to focus on wetland-dependent species, for which significant aspects of their life-cycle requirements are directly and functionally linked to wetlands. Unavailability of relevant wetland habitat or resources at the requisite stage of their lifecycle prevents completion of these cycles and may even prevent survival.

Guiding question for wetland managers

What is the importance of biodiversity for wetland management?

Biodiversity is the basic web of life which enables a wetland to deliver wetland ecosystem services. This includes food supply, tourism, livelihood, water regulation and purification, storm regulation and reducing pollution. Wetland managers therefore need to be better informed regarding the range of biodiversity present, its role in livelihoods and ecosystem service values and its conservation significance.

INVENTORY		ASSESS		MONITOR	
• What type of biodiversity exists?		• Identify threats and drivers of change in biodiversity • Identify fluctuations and alterations		• Monitoring the change and cause of change • Understanding cause-effect relationship	
Parameter	**Indicator**	**Parameter**	**Indicator**	**Parameter**	**Indicator**
Vegetation cover	area, density, structure, type, composition, Ratio Vegetation Index (RVI)	Impacts of human interactions (agriculture, tourism, grazing, etc.) on biodiversity (distribution and composition)	species diversity, population counts, communities, habitat type and use, species of conservation significance	Essential biodiversity variables (these serve as proxies for wetland conditions)	species diversity, composition, abundance and richness, community composition or assemblages, habitat types, extent, fragmentation including critical habitats, regeneration
Different forms of life • Flora- Micro and Macroflora • Fauna- Vertebrates and Invertebrate	list, abundance, distribution, dominance, conservation status, keystone, flagship, medicinal, economically important, population counts	Change in distribution and diversity of invasive species (flora and fauna)		Abundance of invasive species	area under invasive species
Migratory Species	population counts, concentration areas, migration period, status	Trends in biodiversity composition	changes in species composition		
Invasive species	list, growth strategy, area occupied	Trends in abundance and diversity of migratory species	temporal data on abundance and diversity		
Habitat	types, area, associated flora and fauna, biological importance (e.g. fish nursery)				
Mortality	incidental, mass				

Ecosystem Services and Livelihood

Ecosystem services (ES) are the benefits people derive from the ecosystems. These are broadly classified into provisioning (products derived from wetlands including food, fibre etc.), regulating (benefits obtained from regulation of wetland processes), cultural (non-material benefits people obtain from ecosystems through cultural diversity, spiritual and religious values, knowledge systems etc.) and supporting services (services necessary for production of all other services along with nutrient cycling and primary production). Wetland ecosystems and the services they provide form an integral part of the livelihood strategy of wetland-dependent communities. Their livelihood systems often involve adapting to the overall ecological character of the wetland so as to optimize livelihood outcomes. Similarly, livelihood strategies of communities living in and around wetlands also influence their ecological character.

Guiding question for wetland managers

Why is it important to understand wetland ecosystem services and livelihood linkages for management?

It is important to recognise wetland ecosystem services and livelihood linkages to understand the significance in overall livelihood strategies and motivations for conservation. Understanding the degree to which wetlands contribute to people's livelihoods is crucial for wetland management to minimise wetland degradation and enhance the benefits that wetlands have for communities or achieve wise use.

INVENTORY		ASSESS		MONITOR	
• Identify benefits and beneficiaries • Map services, interactions and trade-offs • Understand spatio-temporal availability of services • Determine livelihood dependence on wetlands		• Understand the trends in ecosystem service values • What are the trade-offs? • Determine the impact of wetland degradation on livelihoods • Determine the impact of livelihoods on the ecological character of wetlands		• Monitor the sources of change • Variation in livelihood support over a time period	
Parameter	**Indicator**	**Parameter**	**Indicator**	**Parameter**	**Indicator**
Listing of ecosystem services	provisioning, regulatory, cultural, supporting	Trends in ES provision in relation with underpinning wetland features	yearly trends of ES derived from the wetland components, processes	Wetland productivity	fish catch, number of tourists, crop yield, food resources
Identification of nursery sites		ES services trade – offs	reported resource use conflicts if any	Water supply	quantity, quality, number of users
Ecosystem service beneficiaries	list of stakeholders dependent on wetlands services	Changes in wetland use and priorities	cultural practices, change in extraction practices	Ecosystem services delivery	proxy indicators
Seasonal variation in ecosystem services	ecosystem services distribution throughout the year	Trends in livelihood diversity and impacts on wetland features		Number of resource users, occupation, income, revenue from wetland	
Demography around the wetland	population, occupation profile, seasonality, migration, income profile	Threats to existing livelihoods from changes in wetland features and competing livelihoods		Markets and prices of wetland products	
Dependence on wetlands	type (livelihood, culture and identity), extent, seasonality	Vulnerability assessment – direct and indirect drivers of change in wetland ecology impacting livelihoods	frequency and intensity of flooding, storm surges, drought, spread of invasive species, use of pesticides and fertilizers, fragmentation, land use change	Resource extraction techniques / practices	
Resource use systems (Valuation)	capture fisheries, culture fisheries, vegetation –based enterprise, ornamental fisheries, wetland agriculture, salt production, food and medicinal products, tourism (quantity, quality, income generated, techniques and equipment)				

Institutions and Governance

The status and trends in various wetland features are closely linked to institutional settings and governance systems. Institutions encompass all formal and informal interactions among stakeholders and social structures that determine decision making, power relationships and sharing of responsibilities. Various institutions come together to form governance systems, that include interactions between different centres of power in the society at different scales.

Description of institutions focuses on formal and informal institutions, roles and responsibilities, conflicting interests, governance mechanisms and gaps in existing institutional arrangements. Institutions play an important role in influencing human behaviour towards wetlands by defining and delimiting the resource use patterns and thereby defining incentive structures for the related stakeholders. Institutional arrangements for managing wetlands need to focus on integrating activities across multiple sectors (such as agriculture, water resources, forests, rural development, urban development, forests and wildlife, and others), while ensuring that ecological integrity of these fragile ecosystems is not adversely affected.

Guiding question for wetland managers

Why is it important to understand governance and institutional mechanisms for wetland management?

Good governance, based on fairness, transparency and empowerment of all stakeholders, is essential for sustainable management and wise use of the wetlands. Management of wetland needs adaptive institutions with ability to work at multiple scales and engage with diverse stakeholders primarily the local communities. Additionally, there is need for institutional framework with strong institutional linkages (both formal and informal) with all the stakeholders promoting effective participation. It is also important that all institutions involved in use of wetland resources should develop a common understanding of carrying capacity and problems arising from resource use.

INVENTORY		ASSESS		MONITOR	
• Who is who? • Who plays what role? • Extent of convergence?		• Management practices in the catchment • Exercise of power over management		• Changes in management regime • Stakeholder coordination	
Parameter	**Indicator**	**Parameter**	**Indicator**	**Parameter**	**Indicator**
Stakeholder mapping (organizations related to wetlands management)	mandates, roles and responsibilities, process of decision making	Fit of governance system with the diversity of ES		Collaboration between various stakeholders	data sharing mechanisms, number of meetings, formation of new organisations
Policy, legal, regulatory framework	rules, legislations, policies, regulations and plans, schemes	Convergence among sectoral mandates and responsibilities		Institutional capacity	number of staff, number of trainings, other initiatives undertaken, stakeholder representation in trainings
Resource availability (finance and human)	funds available through various Central and State government schemes	Extent of institutional gaps, overlaps and barriers	transparency, participation, complexity, adaptiveness, leadership, communication mechanisms	Local conflicts	feedbacks, meeting records, complaints, infringement notices
Rights, norms, practices and privileges (community, customary and traditional)		Capacity and training needs assessment		National and state policy support	new policies, changes in existing policies plans and schemes
				Representation of stakeholders in decision making	membership of societies/boards

Way Forward

This framework for wetland inventory, assessment and monitoring has been developed as a tool for conservation and wise use of wetlands in India, through its use in integrated management. This WIAMS framework addresses the existing need for a guidance document for wetland managers in India who mostly function under low resource conditions. The document would support the wetland managers to collect information as well as understand the requirement and expectations when commissioning assessments to external agencies. It will also assist them in identifying potential areas of collaboration with regional scientific institutes and build on the information base to support management planning and decision making.

While we have assessed the various inventory, assessment and monitoring needs as realistically as possible considering Indian conditions, we are also conscious that exhaustive information may not be available in all situations. The idea is to begin with whatever is available, and systematically connect pieces of information to provide a robust basis of decision-making. Within the course of management planning, new information becomes available and enriches understanding of ecosystem functioning and management needs. The manager also needs to be conscious that information exists in diverse forms, from highly technical publications to localized colloquial forms such as customary practices. It is stressed that information in all forms is useful and needs to be internalized and assessed in terms of management utility. Wetlands, being open to dynamic influences, are prone to unpredictable and non-linear changes, and thereby adaptive approaches, build on continuous learning and monitoring holds the key.

Notes

Notes

Wetlands Management for Biodiversity and Climate Protection

The Ministry of Environment, Forest and Climate Change (MoEFCC), in partnership with GIZ is implementing a Technical Cooperation project "Wetlands management for biodiversity and climate protection" with funding support from the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) under the International Climate Initiative (IKI).

The project goal is to strengthen the institutional framework and capacities for an ecosystem-based integrated management of wetlands of international importance (Ramsar sites) in India and is implemented in close cooperation with the National Plan for Conservation of Aquatic Ecosystems (NPCA), the flagship programme for wetlands conservation of the MoEFCC.

The project aims at management of Wetlands of International Importance (3-4 Ramsar sites) in India based on an ecosystem-based integrated management approach integrating climate risks. Three main output areas define the implementation approach of the project:

- Integrated management planning for 3-4 pilot Ramsar sites based on biodiversity, ecosystem services and climate change risks.
- Capacity development of national, state and site level stakeholders for integrated wetland management.
- Development of a wetland monitoring system, including an instrument to track management effectiveness.

Four Ramsar sites have been selected as pilot sites under the project: Pong and Renuka in Himachal Pradesh, Bhitarkanika in Odisha, and Point Calimere in Tamil Nadu. The Wetland Research and Training Centre, Chilika Development Authority (CDA) has been identified as a resource centre for the project. The project is implemented at these sites in partnership with the respective State Wetlands Authorities and site level management institutions. Wetlands International South Asia (WISA) is a technical partner in project implementation.

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