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MINISTRY OF WATER AND ENERGY

Federal Democratic Republic of Ethiopia
Ministry of Water and Energy
Water Resources Management Sector

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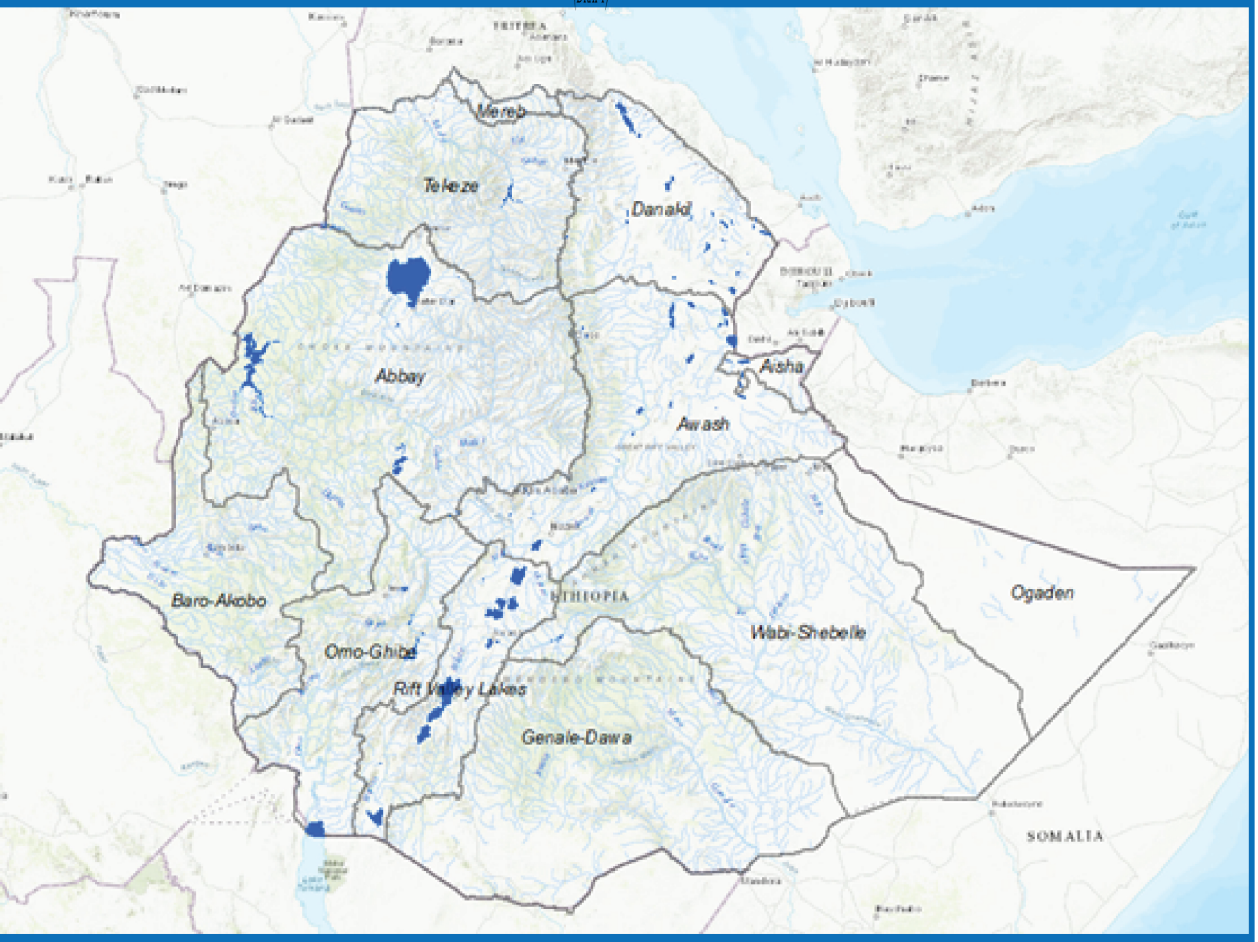

Basin Plan Preparation Guideline

For New Basins, Sub-basins and Thematic Basin Plans

National Integrated Water Resource Management Projects
Coordination Unit

Ministry of Foreign Affairs of the Netherlands

Co-funded by the European Union

Basin Plan Preparation Guideline:

For New Basins, Sub-basins, and Thematic Basin Plans

Prepared by

The National Integrated Water Resource Management Projects Coordination Unit (NIWRMPCU) of the Ministry of Water and Energy (MoWE) with the technical support of Water and Land Resource Centre (WLRC) as part of the Basin Management Support for Resilient, Inclusive Growth and Harmonized Transformation for the National IWRM Program of Ethiopia (BRIGHT) Project. Project Activities and Deliverables

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Foreword

Ethiopia, despite its abundant average rainfall of 848 mm/year and 122 BCM of renewable freshwater across its 12 basins, faces significant challenges in sustainable water resource management. Coupled with the rising demands for and competitions over water for different purposes, recurrent droughts, fragmented stakeholder coordination, and limited institutional capacity have slowed our progress.

Parallel with the socio-economic development and rapid population growth, several attempts were made to manage the country's water resources. Master plan studies of the river basins that started in the eighties were considered the first step towards the sustainable development of water and land resources in those basins. So far, eight basins that cover 86.7% of the country and contain 98.8% of the surface water potential have integrated development master plans. To enhance and promote all national efforts towards efficient, equitable, and sustainable utilization of the available water resources for significant socioeconomic development, the government of Ethiopia issued its Water Resources Management policy three decades ago and the first Water Resources Management Regulation in 2005. Water resources management was also one of the issues addressed under the Water Resources Development Component of the 15-year Water Resources Development Program. In terms of institutional development, the water sector has gone through several dynamics with changing arrangements, duties, and responsibilities. However, water resource management remains the core responsibility of the Ministry of Water and Energy. Although water resource management initiatives were started in the early 1960s with the Awash Valley Authority, the results remain far less satisfactory.

The establishment of the three River Basin Authorities and the Basin High Council with Proclamation No. 534/2007 was a big leap in the history of the sector. Since then, three river basin authorities were established and became fully operational; basin plans were prepared for seven basins and the awareness on basin plan as a tool for basin management has increased. However, lack of experience in basin plan preparation and implementation has retarded the implementation of the prepared basin plans. The preparation of all the basin plans was done without having a national guideline.

As water stands at the center of the Homegrown Economic Reform Agenda, guiding our water and land resources development and management following basin plans is instrumental. The efforts to achieve food self-sufficiency and the associated accelerated irrigation development require critical attention to water resource management. Degradation of the water and land resources can only be prevented through a basin plan-guided integrated approach and concerted effort. The Green Legacy Initiative and other national initiatives indicate that the government has made protecting and restoring nature a priority, for which basin plans are guiding tools. I am thus pleased to have this first Basin Plan Preparation Guideline, which is prepared based on national context, taking lessons from our past experiences and international practices.

We now have an opportunity to tailor the work we do on planning and delivering for clean and adequate water and align it well to our own specific needs. I, therefore, want key actors and our development partners to pay particular attention to our top priority of ensuring a resilient water supply by implementing and supporting the implementation of basin plans.

Abraha Adugna (PhD)
State Minister for Water Resource Management
Ministry of Water and Energy

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Acronyms

AI	Artificial Intelligence
BC	Basin Council
BHC	Basin High Council
BP	Basin Plan
BRIGHT	Basin Development Support for Resilient, Inclusive Growth and Harmonized Transformation in the Water Sector of Ethiopia project
DPSIR	Driver-Pressure-State-Impact-Response
FGD	Focus Group Discussion
GIS	Geographic Information System
IWRM	Integrated Water Resource Management
KPI	Key Performance Indicators
MCA	Multi-Criteria Analysis
MELA	Monitoring, Evaluation, Learning, and Adaptation
M&E	Monitoring and Evaluation
MoWE	Ministry of Water and Energy
NGO	Non-government organization
SDGs	Sustainable Development Goals
SEA	Strategic Environmental Assessment
TYDP	Ten-Year Development Plan of Ethiopia
WLRC	Water and Land Resource Centre
WRM	Water Resources Management

Executive Summary

Ethiopia has embraced Integrated Water Resources Management (IWRM) principles in its water management policies, recognizing basins as the fundamental planning unit for effective water resource development and management. To implement IWRM, the country has established basin administration offices tasked with developing and executing basin plans through inclusive stakeholder participation. However, challenges such as the lack of basin plan preparation guidelines, clear frameworks, strategies for stakeholder involvement, implementation strategies, and monitoring and evaluation guidelines have hindered the effectiveness of these efforts. To address these issues, the Ministry of Water and Energy has initiated the development of a basin plan preparation guideline, forming a dedicated working group to develop practical guidance for streamlined and effective basin planning and implementation.

The primary purpose of the basin plan preparation guideline is to provide a structured framework for developing comprehensive and sustainable basin plans that address the complex challenges of water and land resource management of a basin. These challenges, driven by population growth, economic development, and climate change, require an integrated approach to ensure equitable water distribution, economic efficiency, and environmental protection. The basin plan preparation guideline serves as a strategic reference for the Ministry of Water and Energy (MoWE) to guide the implementation of Integrated Water Resources Management (IWRM) in Ethiopian basins. Its scope includes providing a framework for preparing basin management plans that focus on water resource development and use, incorporating guiding principles, preparation processes, plan structure, and issues of critical considerations. The guideline emphasizes iterative, inclusive, adaptive, and basin-specific approaches to strategically manage water and related resources at a basin and sub-basin levels, ensuring effective planning.

The primary objective of the basin plan preparation guideline is to guide the preparation of a basin plan that ensures sustainable and equitable water resource management by addressing critical challenges through a comprehensive framework. The guideline aims to promote the long-term availability and quality of water resources, integrate water, land, and related resource management, and ensure fair allocation the resources among users and sectors using the basin plan as a tool. The guideline emphasizes environmental protection, pollution control, and climate change adaptation while optimizing economic efficiency. It fosters

stakeholder engagement, capacity building, and the establishment of robust monitoring and evaluation mechanisms, warranting the basin plans support initiative that respond for the needs of communities, the economy and ecosystems sustainably.

The basin plan preparation guideline also emphasizes the strong linkages with other national and international guidelines, programs, and initiatives to grant comprehensive and effective water resource management. It aligns with national policies, regulations, and international conventions such as the Sustainable Development Goals (SDGs), the Ten Years Development Goals (TYDG) and Agenda 2063 while fostering stakeholder coordination to promote collaboration and prevent conflicts. The guideline encourages efficient resource allocation by leveraging funding and technical support from existing initiatives and emphasizes data sharing for informed decision-making. It supports capacity building, incorporates best practices, and establishes robust monitoring and evaluation frameworks aligned with broader systems. Additionally, it prioritizes adaptability to risks, such as climate change and also integrates local culture, social and community needs, making sure that the basin plan is inclusive, resilient, and synergistic with broader sustainability efforts.

The basin plan preparation guideline is based on six key guiding principles. The principles emphasize on envisioning shared, long-term targets for water development; engaging key stakeholders progressively; scaling plans to practical hydrologic units; harmonizing priorities across all levels; addressing interconnected ecosystem issues and linked to associated tradeoffs; and initiating implementation of the basin plan. The preparation process is cyclical, involving seven stages: initiation, resource mapping and governance mechanisms, situation assessment, planning, implementation, and monitoring-evaluation- learning-and-adaptation. Each stage is iterative, focusing on stakeholder engagement, resource allocation, and continuous improvement to ensure the implementation of a basin plan.

The initiation and visioning stage of a basin plan preparation establishes the foundation for successful planning. Driven by factors such as water resource challenges, it emphasizes the importance of political, community and leadership support. The stage involves building stakeholder networks, engaging in face-to-face meetings and using accessible communication tools. A shared vision for a basin is developed collaboratively with stakeholders, defining a long-term future state of the basin that incorporates environmental, economic, cultural, social, and

religious values. This vision guides the creation of both long- and short-term objectives, shaping the basin plan's goals.

A transparent governance mechanism is essential for effective basin plan development and implementation. It defines clear roles, responsibilities, and coordination among stakeholders, supported by legal and institutional frameworks, supportive legislation, policies, and stakeholder participation. Basin organizations must take responsibility for the coordination and reporting of basin plan preparation and implementation. Participatory decision-making, involving both top-down and bottom-up approaches, is crucial to address conflicts, promote collaboration, and ensure sustainable water use throughout the basin.

A situation assessment is a vital step in basin plan preparation, providing a comprehensive understanding of a basin's current state and future trends in terms of water resource-related opportunities and challenges. It evaluates bio-physical, socio-economic, environmental, and legal factors and identifies pressures and their impacts on water resources. This assessment includes hydrological conditions, climate variability, water use, ecological health, and socio-economic needs. It also considers legal frameworks, institutional arrangements, and emerging issues such as climate change- related risks. The assessment forms a baseline for planning, helping to prioritize issues, set objectives, and develop sustainable strategies while ensuring adaptive management and stakeholder participation for effective implementation. After assessing a basin's situation, various water resource-related issues shall be identified, then they will be prioritized based on factors like severity, impact on the environment and the water resource. Analytical tools such as Problem Tree Analysis, Multi-Criteria Analysis (MCA), modeling, and scenario development help in this process. These tools ensure that critical issues are addressed first. After prioritizing, top actionable areas shall be selected for implementation, ensuring the basin plan focuses on resolving the most pressing challenges, with other issues addressed in subsequent phases.

Developing a basin plan involves a collaborative process that begins with identifying and prioritizing water resource management issues, incorporating stakeholder input, and utilizing various analytical tools to define strategic actions. The planning team, typically comprising members of basin organizations, government institutions, and external experts, is responsible for drafting the plan. The structure of the basin plan includes a shared vision, clearly defined goals, objectives, and strategic actions that align with national water management strategies. The vision, typically spanning 15 years, provides long-term direction

and serves as a foundation for setting measurable goals. These goals address critical basin issues, ensuring stakeholder consensus and alignment with sustainable water resource management principles.

Strategic actions within a basin plan are developed to address prioritized issues, guaranteeing accountability and transparency in implementation. These actions are designed collaboratively with stakeholders, including government bodies, communities, and private sector representatives, to ensure their relevance and contextual appropriateness. Thematic areas, such as water allocation, water quality management, and watershed management are integral to the basin plans which focus on specific issues. Strategies are derived through scenario development, modeling, and stakeholder workshops, emphasizing practicality, stakeholder buy-in, and alignment with real-world conditions. Trade-offs, political realities, and stakeholder consultations are critical considerations for developing feasible and acceptable strategies.

A basin plan also defines the planning unit, which can vary from basin to sub-basin or watershed levels depending on the complexity and urgency of issues. It incorporates a robust framework for Key Performance Indicator (KPI) development to monitor progress, assess implementation impact, and guide adaptive management. Specific KPIs are selected through stakeholder consultation and guided by principles of relevance, resource efficiency, and flexibility to reflect localized needs. Regular reviews and updates, typically, every five years, ensure the basin plan remains adaptive to changing environmental, political, and socioeconomic conditions, supporting sustainable water resource management over its 15-year timespan.

The implementation strategy of a basin plan emphasizes stakeholder engagement, clear roles and responsibilities, adequate resourcing, and regulatory compliance to warrant success. Stakeholder participation is central, with roles distributed among basin organizations, government agencies, communities, and private sectors. Communities drive behavioral change and track compliance through experience, education, advocacy, and monitoring efforts, while private sector involvement facilitates practical implementation. A strong institutional framework defining operational responsibilities, accountability, and funding mechanisms is thus important. Resourcing must include alternative revenue generation strategies to ensure sustainability. Additionally, legislative support and independent regulatory bodies are recommended to enforce compliance and resolve disputes transparently and equitably.

Communication with stakeholders and capacity development are critical enablers for the basin plan implementation. A robust communication strategy confirms data collection, standardization, and dissemination to stakeholders, enhancing monitoring and decision-making. Stakeholder analysis, secure data sharing protocols and regular updates guarantee effective engagement and transparency. Disseminating information in accessible formats and local languages fosters understanding at the community level. Capacity development fills gaps in skills and resources among stakeholders and implements targeted strategies to bridge these gaps, ensuring that all participants align with the plan's objectives and can contribute effectively to its implementation.

The Monitoring, Evaluation, Learning, and Adaptation (MELA) strategy of a basin plan focuses on tracking progress, safeguarding accountability, and facilitating adaptive management to meet sustainability goals. Monitoring and Evaluation (M&E) bodies, drawn from public institutions, private sectors, civil society, and research entities, play a critical role in collecting, managing, and analyzing data across different levels. They evaluate compliance with Key Performance Indicators (KPIs), socio-economic impacts, and stakeholder engagement. M&E activities are conducted at defined intervals, like quarterly, annually, or every five years, by using tools like the Public Interest Framework, analytical online and offline tools, and focus group discussions. Updates and adjustments of a basin plan may be done as required, following guidelines prepared for the update and revision of a basin plan. Adaptive management ensures the plan remains flexible to environmental, socio-economic, and political changes, incorporating feedback and addressing implementation gaps.

Learning mechanisms are embedded to assess gaps, foster accountability, and promote transparency. Regular reporting and data sharing are integral part of a basin plan, with standardized information made accessible to all stakeholders. In the guideline, incentive mechanisms are recommended to encourage effective implementation of a basin plan and sustainable water resource management. Through this dynamic and responsive approach, MELA supports continuous improvement, stakeholder engagement, and evidence-based decision-making.

In this guideline, it is indicated that the validation and endorsement of the basin plan involve a structured, multi-stage process to ensure stakeholder engagement, technical accuracy, and regulatory compliance. The process begins with consensus-building among stakeholders, followed by drafting a plan collaboratively. The draft undergoes public and stakeholder review, as well as technical evaluation by

experts, with feedback integrated into the final version. The validated plan is then submitted to MoWE and subsequently presented to the highest decision-making body, the Basin High Council/Basin Council (BHC/BC), for endorsement. Once endorsed, implementing the Basin plan becomes mandatory for all actors. The finalized basin plan will be published and shared with the public, ensuring transparency and paving the way for effective basin plan implementation.

1. Introduction

1.1. Background

Ethiopia has adopted the principles of Integrated Water Resources Management (IWRM) in its Water Resources Management policy and has already put in place water legislation, strategies, and programs for their implementation. Accordingly, the Ethiopian Water Management Policy recognized basin as the fundamental planning unit in the water resources management domain. As an enabling environment for the implementation of IWRM, three basin administration offices (formerly known as Basin Authorities) have been established to ensure the implementation of integrated water resources management in the country. One of the priority mandates of the basin administration offices in the national context is to develop and implement a basin plan through the inclusive participation of stakeholders.

Accordingly, some efforts were made to prepare and implement basin plans. Despite those efforts, findings of the Baseline situation assessments done by WLRC and MoWE indicated that the anticipated results have not been achieved. The basin planning processes are not well-organized and coordinated. Furthermore, the implementation is not fully practiced. The main problems in the basin planning and implementation processes are lack of framework or guideline for basin plan preparation, lack of strategy to ensure participation of the key stakeholders during the different stages of the basin plan preparation and implementation, absence of a well-designed framework and mechanism for the implementation of the basin plan, and lack of well-formulated mechanism and guideline for monitoring and evaluation of basin plan implementation progress and outputs. To alleviate the problems and ensure effective preparation and implementation of a basin plan, developing practical basin planning guidelines was found a necessity, not an option.

Cognizant of these issues, the Water and Land Resources Centre and the Ministry of Water and Energy (MoWE) initiated a Basin Plan Preparation Guideline Preparation Task Team comprising senior experts in the sector. That Task Team prepared this basin plan preparation guideline.

1.2. Purpose and Scope of the Guideline

1.2.1. Purpose of the guideline

The implementation of a basin plan arises from the need to address multifaceted challenges in water resource management comprehensively and sustainably. Rapid population growth, economic development, and climate change exert significant pressures on water resources, leading to increased demand, pollution, and variability in water availability. Traditional sector-specific approaches often fail to consider the interconnectedness of the water resources systems, resulting in inefficient and unsustainable management practices.

A basin plan provides an integrated framework that coordinates the development and management of water, land, and related resources within a basin. By promoting collaborative efforts among government agencies, local communities, the private sector, and civil society organizations, the plan ensures the equitable distribution of water, economic efficiency, and environmental protection. It leverages legal and institutional frameworks, stakeholder engagement, and innovative solutions to foster sustainability.

Therefore, a basin plan is a proactive and holistic solution designed to address the complexities of water resource management, ensuring long-term benefits for both people and ecosystems. The primary purpose of this guideline is to establish a frame of reference for preparations for basin plans. It is the guiding instrument to the preparation of basin plans by clearly showing the purpose of basin management planningng, the relevant considerations to address the process to follow and the structure to develop the basin plan.

1.2.2. Scope of the guideline

This basin plan preparation guideline serves as a crucial tool for strategic water resources management within Ethiopia's Integrated Water Resources Management (IWRM) framework. Its scope is defined by: 1) providing the Ministry of Water and Energy (MoWE) with a reference for developing basin, sub-basin, and thematic basin plans; 2) ensuring its applicability to all basin plan preparations in Ethiopia, focusing on water resource development and utilization; 3) outlining the guiding principles, preparation process, structure, key considerations, and purpose of basin plan development; and 4) promoting iterative, inclusive, adaptive, and basin-level approaches for strategic water and related resource planning.

1.2.3. Basin plan objectives

A basin plan is designed to address a variety of water-related challenges and to manage water resources effectively and sustainably. The primary objectives are shown in Figure 1:

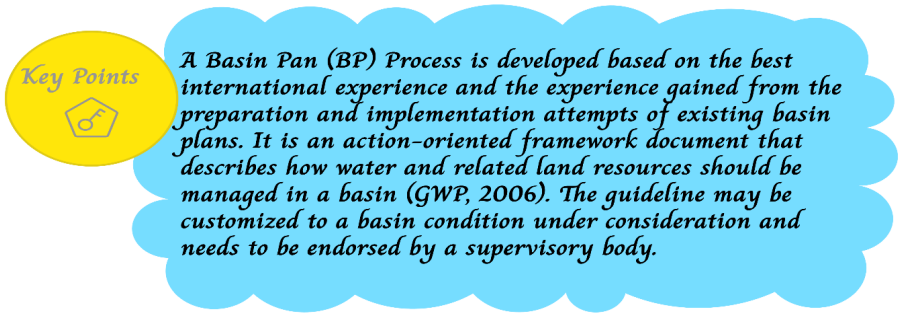
Figure 1. Basin plan objectives

1.3. Linkages with Other Strategies, Programs, and Guidelines

The Basin Plan's success hinges on its integration with broader frameworks, necessitating a strong linkage with other guidelines (e.g., environmental policy, rural and agricultural policy, urban land development and management policy. As a multi-sectoral plan, it must connect with national and international programs to achieve comprehensive effectiveness. This integration involves aligning with existing policies and regulations, ensuring compliance with national laws and international conventions like the SDGs, Agenda 2063, TYDGs, etc. Importantly, it requires robust stakeholder coordination, engaging government agencies, communities, NGOs, and international bodies to foster collaboration and prevent conflicts. Resource allocation and funding are vital, demanding the identification of funding sources and efficient use of resources by aligning with existing development undertakings. Data and information sharing are essential, necessitating mechanisms for data exchange to enhance decision-making. Capacity building and technical support, as well as leveraging national and international partners, are critical for effective implementation. Incorporating best practices and innovative solutions from other programs is also essential, adapting successful case studies to the local context.

Additionally, a robust monitoring and evaluation framework is needed to track progress and measure impact, aligning with existing monitoring systems. The plan must also address risk management and adaptability, considering climate change and socio-economic changes to ensure resilience. Cultural and social considerations are paramount, respecting local values and addressing the needs of vulnerable groups. Finally, regional laws and programs must be included alongside national and international frameworks. Considering these factors ensures the basin plan is well-integrated, contributing effectively to sustainable water resource management.

2. The Basin Planning Process



2.1. Guiding Principles

Basin planning is the first process of implementing IWRM to support the development of participatory, coordinated, sustainable, and equitable water resources in basins. Therefore, the guiding principles for the preparation of the basin plan emerge from these facts and the following are the essential underlying principles.

- Principle 1: **Envision** far-reaching and shared targets of water development and use objectives of the basin;
- Principle 2: **Engage** key role players of strategic basin plan implementers during the process in a progressive manner
- Principle 3: **Scale** the planning of the strategic basin plan to the lowest practical hydrologic units
- Principle 4: **Harmonize** International, regional, national, sub-national, sectoral, and basin priorities and long-term objectives
- Principle 5: **Nexus**: Interrelated issues in the ecosystems have to be well-thought-out and linked to associated tradeoffs such as the water-energy-food security nexus.
- Principle 6: **Start** the implementation of the strategic basin plan while developing it.

2.2. Key Steps in Basin Plan Preparation

Planning is a cyclical rather than a linear process. The cycle starts with engagement, assessment, planning, and implementation, then leads to evaluation, reporting, learning, and revision to remake or refresh the river basin plan. In this guide, basin planning is organized into the following seven planning steps (Figure 2).

- **Initiate -** this is the initial stage to justify the need for BP and decide to start the process. At this stage, a preliminary assessment of the interest of key actors in the basin plan and key issues they want to be incorporated shall be done.
- **Basin IWRM resources mapping and governance**- Once agreement is reached on the need for BP, a preliminary assessment of the resources available shall be done (who is doing what, where and how shall be identified.
- **Intuitional and governance mechanism -** BP is highly linked with governance systems. At this early stage of the BP preparation, the existence of political support is required at all levels of decision-making ladders; and enabling environments such as policy, legal instruments, indigenous knowledge and institutional arrangements that are required for BP shall be scanned.
- **Basin situation assessment** – this requires more time, effort and involvement of multidisciplinary experts. Upon completion of the basin situation assessment, the state of a basin in terms of water resource development and management shall be well understood to prepare an implementable BP. The basin situation assessment shall also indicate trends and forecasts that should be considered in the BP.
- **Planning -** This is the core of the planning process that comes after going through the preceding steps successfully. The planning shall provide options and robust strategies for the implementation of the chosen option.
- **Implementation –** T plan shall be communicated to all implementing stakeholders to validate facts and arrive at a consensus. The plan shall pass through all the approval stages and be endorsed by the highest decision-making body. The availability of resources and communications systems shall be ensured at this stage.

- **Monitoring, evaluation, learning, and adaptation (MELA) -** Periodical monitoring of the implementation of the plan shall be made using agreed M&E methods and reporting mechanisms. Lessons learned shall be documented and used to make necessary adjustments in the plan. The good lessons will be further adopted in future planning cycles.

These can be seen as all seven need to overlap and iterate to some degree throughout the process of preparing a basin plan.

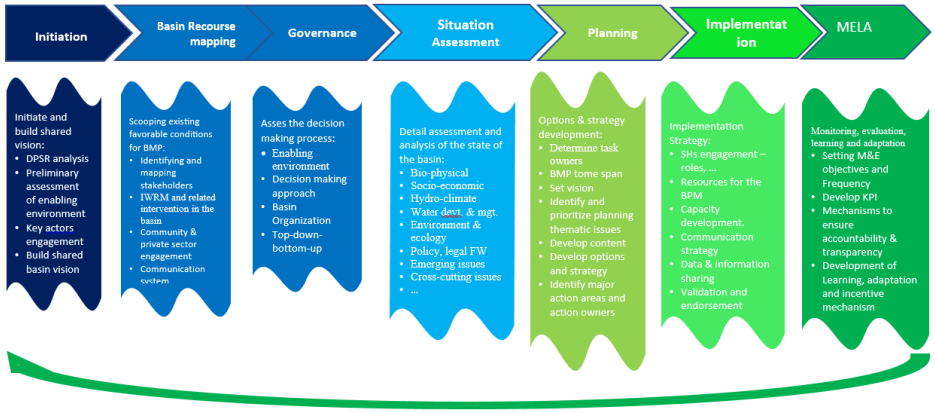


Figure 2. Steps and critical considerations in the basin planning preparation

3. Initiation and Visioning

This stage is required to get a clear understanding of the action and ensure the drivers to carry out basin planning are clear; to ensure that values of the stakeholders are duly integrated; ensure that a network of support is built for basin planning through early engagement; and develop basin vision, values and long-term objectives with stakeholders.

To achieve these outcomes, the following key activities to be undertaken at this stage:
. Establish advocacy groups drawn from key potential implementing agencies to articulate why basin planning is needed and ensure sufficient consensus to initiate a process.
. Initiate the planning process and build a network of support and acceptance of the need for basin planning.
. Seek political leadership and support between all relevant political stakeholders for a basin plan.
. Seek to transparently identify and assess the values and objectives of all stakeholders and engage stakeholders in establishing a basin vision.
. Develop long-term objectives with stakeholders to translate the basin vision into specific aims for the plan to achieve within a specified time frame and with available resources.
. Understand the technical, engagement and communication skills and capabilities of the institutions responsible for basin planning.

3.1. Rationales

It has been over a decade since basin plan was introduced in Ethiopia. The large public and the highest governing body in the basins are not yet well aware of the importance of a basin plan. This makes this initiation stage a very essential part of the basin plan process. Initiation is required for building a network of support among stakeholders, reaching an agreement in principle that a process

of basin planning is necessary, and developing a shared vision and objectives. Basin plan needs strong political support. Gaining support from political leaders and acceptance from the stakeholders helps create the space for stakeholder engagement, gathering of information, and negotiation and decision-making on key elements of the basin plan.

Visioning is another important component of this stage. It is required to engage with the stakeholders to develop an overall vision of managing a basin that is informed and shared by the stakeholders at large. Specific objectives can then be developed in consultation with the implementing partners. Depending on the basin context, it may be important at this early stage to identify and justify which agency is most appropriate to lead basin planning. In some cases, it may be appropriate to add an organization as a co-lead, depending on the influence and contribution it may have during the planning process. It is necessary to make sure that key sectors at federal and regional levels are involved in endorsing decisions and the pathway forward. Stakeholder engagement and leadership are critical in the initiation and development of the basin plan. Identifying and prioritizing engagement is important to raise stakeholders' confidence in the process, which has significant implications for the development of the plan.

3.2. Critical Considerations

3.2.1. Drivers for initiation

Drivers for the basin plan shall be well investigated and analyzed following Driver Pressure State Impact Response (DPSIR) or related frameworks. It shall indicate the importance of basin planning in proactively managing future challenges, to respond to resource competition, such as conflict over access to, or poor quality of, a water resource. Initiation may occur in a range of circumstances, for example, due to stakeholder pressure, environmental degradation, crises such as drought or floods, water management disputes, funding drivers, or leadership changes, which are prevalent in Ethiopia.

Drivers for basin planning may include both community pressure and government actions leading to ongoing nationwide water reforms. However, there are several causes for the calls to action. These include catchment and environmental degradation, recurrent drought, increasing flood hazards, pollution and increasing demand for irrigation and other uses and competition for the dwindling available water.

At this early stage, identification of all stakeholders with a legitimate interest or dependency on the water resources helps to ensure that all the relevant issues are included and that a suitable strategy is developed to engage the community. Community and political leadership and agreements are significant enablers for coordinated action at a basin scale. Once the decision is taken to initiate a planning process and stakeholders are identified, the following major activities shall be done:

- **Build a network of support**, including amongst key leaders in the community, sectors and governments and the community. Water resource management professionals in regional states and the federal government can play a key role in building understanding and support for the basin plan concept. At an early stage, identify all the stakeholders who are interested in the water resources of a basin. Face-to-face meetings allow discussion of new ideas and the identification of common issues. They build a consensus and generate support for larger meetings, negotiations, workshops, or conferences involving all parties. As much as possible, use local and plain language and avoid technical or bureaucratic terms when establishing forums for the community and communicating with stakeholders in regional states. Visual tools like maps, images, and pictures can be an effective engagement tool for interpreting the state of the basin.

- **Engage with stakeholders.** Initial engagement with stakeholders needs to articulate the issues and opportunities clearly and make the case for commencing basin planning. Political leaders' support for basin planning is important for stakeholder engagement, data collection, and management, governance, and compliance processes to be prioritized, funded, and actioned. Once they believe in its importance, politicians can play an important role in articulating the need for basin planning to start. It is also good to identify other champions and enablers who are thought leaders and influencers but do not have a formal role, such as academics, practitioners, or non-government organization leaders who can be important champions. The process of engaging and negotiating with communities, users and stakeholders will help reveal the interests and needs of all parties. It also helps to build trust even with those parties whose personal vision may not be fully reflected in the final basin plan. Sections four (4) and seven (7) provide more detail about how to engage with the community and stakeholders.

Basin planning addresses a broader spectrum of issues, including watershed management, water allocation, water quality management, pollution control, flood and drought management, etc. The plan's scope and focus should be decided in the first rounds of engagement. Additional issues can be added to the process as they emerge and are deemed important enough to adjust the scope of the basin plan. An overall plan that integrates management across boundaries and across various interrelated water resource management issues is central to Integrated Water Resources Management (IWRM).

3.2.2. Build a shared basin vision

Having a shared desired future state of the basin is an important initial step in basin planning. Formulating a vision for the basin involves working with stakeholders to develop a description of the desired future state of the basin based on a range of environmental, economic, cultural, social, and religious values. The vision describes the long-term future. It is important that it encompasses the breadth of values and benefits derived from the water and land resources within a basin. The vision will provide guiding principles and direction to the planning process. It provides the basis for the development of specific long- and short-term objectives and planning. Due to its importance in setting the direction of the basin plan, it is important to develop the vision using participatory processes to engage all relevant stakeholders.

Based on the agreed basin vision, develop long-term objectives with stakeholders. These long-term objectives translate the basin vision into specific aims for the plan to achieve within a specific timeframe and using the available resources. The objectives are the building blocks that will underlie and shape the basin strategies and ensure they are designed to meet the basin vision. Clear objectives are necessary, and agreement on these should be aimed for, recognizing that negotiation of objectives with multiple stakeholders will be required to achieve the basin vision. Objectives may change and evolve as the basin planning process proceeds. Ensuring that a basin plan's objectives align with the policy and legal frameworks and tools to achieve the intended outcomes is important.

Following the identification of a vision and objectives for the basin, the following can be developed:

- **Outcomes -** the benefits or other long-term changes that are sought from implementing the plan and that will be achieved by meeting the plan's targets.

Outcomes are linked with objectives in that if the outcomes are achieved, then the project's objective/s have been met;

- **Targets** - outcomes that have a measurable benefit and will be used to gauge the success of the plan. The targets will be specific and so can only be finalized once the strategies in a basin plan have been decided after engagement and negotiation with stakeholders.

Identified and adopted targets should be Specific, Measurable, Achievable, Relevant, and Time-bound. The development of a monitoring, evaluation, reporting, learning and adaptation framework is further described in Section Eight of this guideline.

The preparation and implementation of a basin plan requires a holistic approach to water resource management, ensuring the availability of resources and active stakeholder participation. Resource mapping plays a key role in identifying projects, allocated resources, and relevant actors, enabling effective coordination and timely implementation of strategic measures. Stakeholder identification, assessment of IWRM interventions, community and private sector engagement, gender and youth inclusivity, and an efficient communication system are critical considerations in IWRM basin resource mapping. Stakeholder mapping defines key actors and their roles, ensuring logical linkages for achieving basin targets. The assessment of IWRM interventions focuses on governance clarity, coordination mechanisms, financial sustainability, and alignment of plans to avoid duplication. Engaging communities and private sectors ensures inclusivity and shared responsibility in water governance, while gender mainstreaming addresses disparities to enhance participation. An effective communication system facilitates transparency, knowledge sharing, and collaboration across all levels, leveraging digital and traditional methods for broader reach and impact.

An effective governance mechanism for basin planning requires clear roles and responsibilities among stakeholders at federal, regional, and local levels, ensuring coordination and accountability. It involves mapping stakeholders, defining their contributions, and establishing logical linkages to achieve basin plan targets. Integrated Water Resource Management (IWRM) interventions must align with governance structures, ensuring clarity in decision-making, sustainable financing, and minimizing overlaps. Community and private sector engagement is crucial for inclusive participation, while gender and youth inclusivity ensures equitable resource management. A well-structured communication system enhances transparency, data sharing, and stakeholder collaboration through digital and traditional platforms, supporting informed decision-making and adaptive basin management.

4. IWRM Related Resource Mapping and Governance

4.1. Justification

The implementation of a basin plan requires a holistic view of water resources management objectives, key measures and assigned resources for its implementation. The rapid assessment and mapping of these elements help to ensure the availability of resources to initiate a basin plan while showing the will and readiness of stakeholders to implement.

The resource mapping for basin planning involves collecting information on IWRM-related undertakings such as projects, allocated resources, and the identification of key actors and stakeholders that influence the preparation of basin plans. This important task determines the basin planning requirements related to available resources to step up to a quick implementation of potential measures and to associate with actors at the initial level of implementing basin plan. It also dictates the setting up of reasonable targets and timeframes for each strategic activity in the basin plan.

4.2. Critical Considerations

4.2.1. Identifying and mapping stakeholders

The first foundational step in basin resource mapping is to make a rapid identification and mapping of stakeholders. Thus, the critical considerations during this process will be: -

- Defining the key implementing and collaborating actors for selected thematic interventions at basin and sub-basin levels, such as government organizations, development partners, NGOs, private sectors, civil society organizations, and research institutions;
- Understand the inherent commitments the contributions they can make on the basin planning and implementation;
- Determining the logical linkages of stakeholders on specific measures towards achieving basin plan targets;
- Identifying the key roles and responsibilities of those stakeholders in the basin planning and its implementation at basin, sub-basin and catchment scales;

- Map stakeholders based on their potential roles, interests, influence, and impact on basin plan;
- Assess stakeholders' knowledge, capacity, and resources to engage meaningfully in the basin planning and implementation process;
- Design engagement strategies to align with stakeholders' needs, ensuring inclusivity and accessibility, including local languages and culturally sensitive approaches;
- Map the socio-economic conditions, resource dependencies, and environmental vulnerabilities of stakeholders;
- Develop strategies for continuous stakeholder engagement throughout the planning, implementation, and evaluation phases.

4.2.2. Assessment of IWRM and related intervention on the basin

The core IWRM-related interventions to be considered shall include: -

- Define the roles of various actors at federal and regional levels, ensuring clarity in governance and decision-making processes and map existing coordination mechanisms and partnerships, focusing on how well they integrate across sectors and scales;
- Evaluate how identified interventions contribute to integrated water resources management and basin plan implementation. In addition, define whether interventions target specific geographic areas (e.g., upstream, downstream) or thematic areas (e.g., water quality, climate resilience, watershed management, flood protection, water body protection, etc.);
- The core water and water-related interventions in the hands of the stakeholders in the aspects of their plans, programs, projects and related resources to commit to the shared vision and objective in the basin plan;
- The potential future plans in the federal and regional governments, plans with bilateral and multilateral cooperation, and projects with other development partners;
- The proper level of linkages of the interventions to produce sustainable results in IWRM implementation; and alignment and misalignment issues associated with the plans, programs and projects;

- Identify overlaps or gaps between interventions to avoid duplication or conflicting efforts for making projects harmonized;
- The information on the identified strategic issues, progress updates, performance measures and scores, outcomes and beneficiaries of plans, programs and projects. Identify and map the availability of shared data, research, and monitoring systems to track intervention outcomes;
- Identify financial resources supporting interventions, including federal budgets, regional allocations, donor contributions, and private investments. Assess whether funding mechanisms are sustainable and aligned with long-term basin planning goals;
- Identify and ensure interventions are designed to be flexible, with mechanisms for learning and adaptation based on changing circumstances;
- Ensure interventions address regional disparities within the basin to ensure fair water resource allocation.

4.2.3. Engagement of the communities and private sectors

Engagement of communities is expected to be assessed by considering socio-economic and cultural attributes of representative communities in a basin. Similarly, the engagement of the private sector need to be assessed considering all economic profiles. The following aspects are fundamental in the engagement of communities and private stakeholders:

- Identify key community groups, including local water users, farmers, indigenous groups, and women's organizations;
- Ensure diverse representation from all affected communities, including marginalized and vulnerable populations;
- Identifying or mapping the issues that drive the community positively and towards local, basin, national, and global issues that benefit them;
- Evaluate existing community participation mechanisms in water governance (e.g., local water committees, user associations);
- Defining the resources and level of commitment or contribution within the community itself for the identified or mapping issues;
- Assess the level of awareness regarding basin planning among community members;

- Assess the level of community involvement in interventions and how these initiatives address local needs and priorities;
- The capacity of the local community to go for integrated management of water resources and affinity towards accepting or collaborating for integrated solutions;
- The role of the private sector in undertakings to support alleviating the public challenges and the experience developed in this regard;
- The mechanisms deployed to make the community and private sectors at large for joint planning and implementation of plans and projects in association with learning to overcome coordination and collaboration challenges;
- Assess the effectiveness of basin-level and sub-basin-level platforms in engaging the communities and private sector;
- Assess how basin planning impacts community livelihoods;
- Identify community-led initiatives for conservation, restoration of the ecosystem, and enforcement of water bylaws, rules, etc.;
- Assess the willingness of private entities to contribute to basin plan preparation and implementation efforts, and also identify how private sectors can contribute through investments in water efficiency, pollution control, and corporate social responsibility (CSR) initiatives;
- Ensure private sector engagement aligns with water resource policy, proclamations, regulations and basin plan objectives;
- Assess opportunities from the private sector to adopt circular economy approaches (e.g., wastewater recycling, water-efficient technologies);
- Identify existing potential partnerships and collaborations between government, private sectors, and communities.

4.2.4. Gender and youth inclusivity

Women are the most affected by the degradation of the ecosystems. A basin plan that is prepared with due consideration of the women and the youth will have a higher impact on these marginalized groups. Integrating gender, youth and inclusivity into basin resource mapping is crucial for achieving equitable and sustainable integrated water resource management. The following key considerations should be assessed to ensure gender and youth responsiveness of a basin plan preparation and implementation: -

- Identify and map women's roles in integrated water resource management throughout the basin and also recognize marginalized women (e.g., indigenous women, disabled women);
- Assess the level of women's involvement in water governance structures, such as basin committees and water user associations;
- The gender differences, issues and inequalities, and the opportunities in the WRM in the basin or sub-basin for addressing gender issues;
- The gender mainstreaming targets in the IWRM core functions to ensure inclusion, safety and acknowledging gender differences and inequalities;
- The level of awareness and readiness to incorporate gender issues in water resources management topics plans, programs, and projects (like allocation, permitting and licensing, disaster control, information sharing, and the like);
- The gender boxes (gender barriers) hindering inclusive water management and limit developing shared vision and ambitions, and affect complete performance in the basin planning and implementation;
- Identify barriers to women's participation (e.g., cultural norms, lack of access to information, time constraints due to unpaid labor);
- Ensure representation of women's groups at all levels of decision-making processes;
- Evaluate the availability of training and awareness programs tailored for women on water resource management.
- Evaluate the socio-economic impact of basin planning on women's livelihoods, particularly in agriculture, fisheries, and small businesses.

4.2.5. Communication system

A well-structured communication system is essential for effective stakeholder engagement, transparency, and collaboration in basin plan preparation and implementation. The following key considerations should be considered: -

- Assess the status of communication channels across federal, regional, basin, and local levels to ensure alignment;
- Assess the existence of developed and utilized digital platforms such as web portals, mobile applications, and social media for data collection, real-time updates and information sharing;

- Evaluate the presence and use of traditional communication methods like community radio, local newspapers, focus group discussions, elder communities and posters for areas with limited internet access for effective information sharing and data collection;
- Check the existence of data collection and sharing protocols, formats in different local languages to ensure inclusivity and to increase accessibility;
- Check for the presence of stakeholder forums, workshops, and knowledge-sharing platforms where stakeholders exchange best practices and lessons learned;
- Establish an open-access database for some basin-related data, including basin plan preparation and implementation progress, while ensuring data security and privacy, particularly for sensitive basin-related data;
- Collect stakeholder feedback on the effectiveness of existing communication tools and channels in the basin.
- Develop clear protocols for information sharing between government agencies, research institutions, and the public;
- Check for the existence of developed coordination and communication mechanisms between government agencies, basin organizations, communities, NGOs, and private sector actors.

4.3. Governance Mechanism

4.3.1. Background

A transparent governance mechanism is an essential condition for the basin plan development and sound implementation. In this guide, the legal framework should determine authority and responsibility for the different aspects of basin plan development and implementation, define the responsibilities of key stakeholders, and provide transparent arrangements for coordination and cooperation. The institutional framework shall indicate the legal basis and determine how the various main tasks in the basin plan are distributed across the various institutions, and how these various institutions cooperate and coordinate.

4.3.2. Critical considerations

Enabling environment

- **Legal instruments**

Basin-level water management processes can be influenced by many factors, including legislation and regulation, governance arrangements, power structures, policy implementation scales ranging from the basin to the national level, stakeholder participation, and decision-making.

It is critically important to assess that there are supportive legislative instruments/ laws, rules& regulations, policies and strategies/ basin organizations to coordinate their implementation and other institutions to take up full responsibility for implementing the basin plan.

- **Basin WRM institutions**

A basin plan is only as good as the effectiveness of the various institutions that support its implementation. It is, therefore, critically important to consider for the various institutions and lead agents to take up full responsibility to see this basin plan implemented.

It is understood that this plan is, in effect, a living plan and will develop with time. This can only happen if, collectively, a basin organization and the various stakeholders work towards implementation and, in so doing, develop a shared understanding of the challenges, the successes, the lessons learned, and the key next steps. Delegation of responsibility to the appropriate institution, together with ongoing reporting, becomes a cornerstone of the implementation of the plan.

Without a dedicated coordinator with independent responsibility, this is a collaborative process that involves the participation of many diverse stakeholders in the different platforms of coordination. In this guide, 'institutional arrangements' refer to the responsibilities, modes of operation and legal status of these various entities and how they relate to one another for the basin plan development and implementation.

- **Bottom-up and top-down participation and dispute resolution**

Participation in decision-making for water governance may take a variety of forms during basin plan development and implementation. A range of stakeholders with

a diverse set of knowledge and expertise may be engaged at multiple scales across space and time.

Figure 3. key points that should be considered during situation assessment

Ensuring participatory processes help address conflicts around decision-making and introducing collaboration to achieve better outcomes in a basin plan implementation. Lack of transparency and involvement in the decision-making process may result in conflicting water use across a basin, leading to unsustainable water use and insufficient or unsafe water supply for downstream users.

Basin planning shall consider and justify that opening up decision-making processes both top-down and bottom-up to multitude participants is an important step to allow for both greater representation of multiple interests and confronting the status-quo discourse.

5. Situation Assessment

5.1. Justification

A situation assessment is a critical step in preparing a basin plan, as it provides a comprehensive understanding of the current state of the basin, analyze and evaluates the future trends from a physical, biological, social-economic and environmental perspective, and identifies the pressures and impacts on the basin. This forms a basis to identify and prioritize key issues and formulate appropriate intervention measures. The situation assessment also provides baseline data and information for monitoring and evaluation of the outputs of basin plan implementation. The situation assessment at the start of basin plan will form an important "baseline" to the whole Basin Plan process. For this reason, the information and data collected needs to be relevant to the setting of vision, objectives, strategies and actions of the basin plan. The situation assessment can be presented in a 'state of the basin' report. It enables decision-makers to develop effective, fair, and sustainable strategies for managing the basin's water and land resources. The situation assessment approach should embrace IWRM principles and approaches.

5.2. Critical Considerations

5.2.1. Basin bio-physical situation assessment

The biophysical situation assessment is an essential part of the basin planning process, as it evaluates the state and dynamics of the natural environment in a basin that are essential to prepare a comprehensive basin plan. This shall include, but not limited to, the following attributes of a basin:

- Location
- Physiography and drainage system
- Geological and hydrogeology
- Soil characteristics
- Land use and land cover dynamics

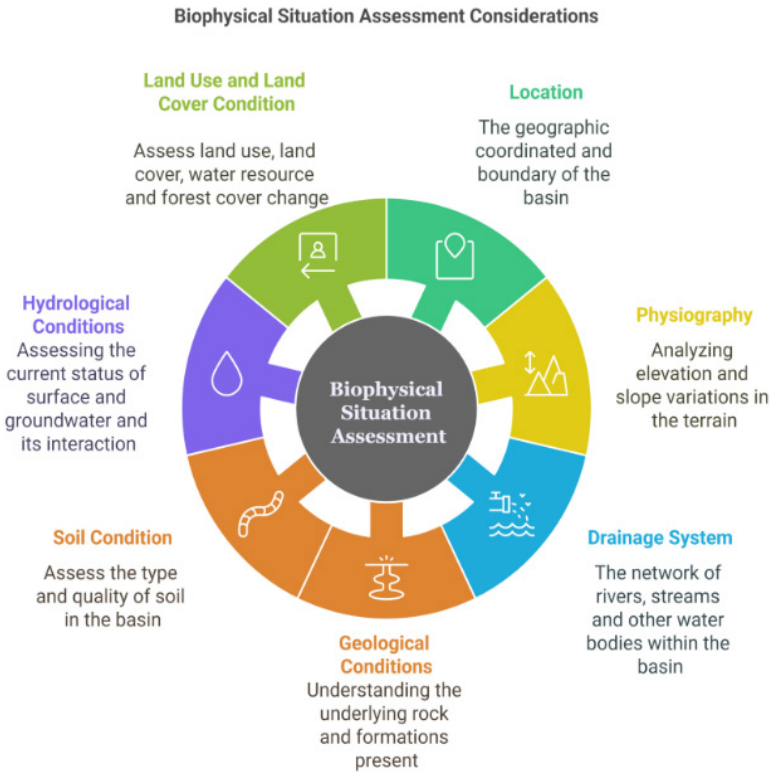


Figure 4. Biophysical situation assessment considerations

5.2.2. Hydro-climate conditions

The situation assessment of the hydro-climatic condition of the basin considers the current and future forecast of hydrological conditions and climate parameters (precipitation, temperature, evaporation, and climate variability).

These considerations are essential for developing strategies that ensure the sustainable management of water resources, even in the face of a changing

climate. The key considerations in the hydro-climate dimension, as shown in Figure 5 of the basin plan, include:

- the assessment of different climatic parameters like precipitation, temperature, evaporation, and climate variability;
- the linkage between the hydrologic and climate variability to adequately respond to risks, mitigation and adaptation measures;
- the interlinkage of the hydrologic cycle and ecosystem services in a hydrologic unit to optimally function and support the growing socio-economic needs;
- the interaction of surface and groundwater resources, upstream and downstream uses, hydrologic and climate factors, and human activity and environmental responses in the water system;
- the water resources use and users, water availability and distribution and future projected needs for the socio-economy activity and environment protection;
- the water related risks pertinent to the basin or sub-basin, or catchment and the need for developing mitigation or response systems;
- the need for an adequate water resources monitoring system that ensures water resources allocation, quality control, permitting and licensing, and disaster management such as flood and drought; and
- the availability or adequacy of hydrologic data and information for planning and management at appropriate scales.

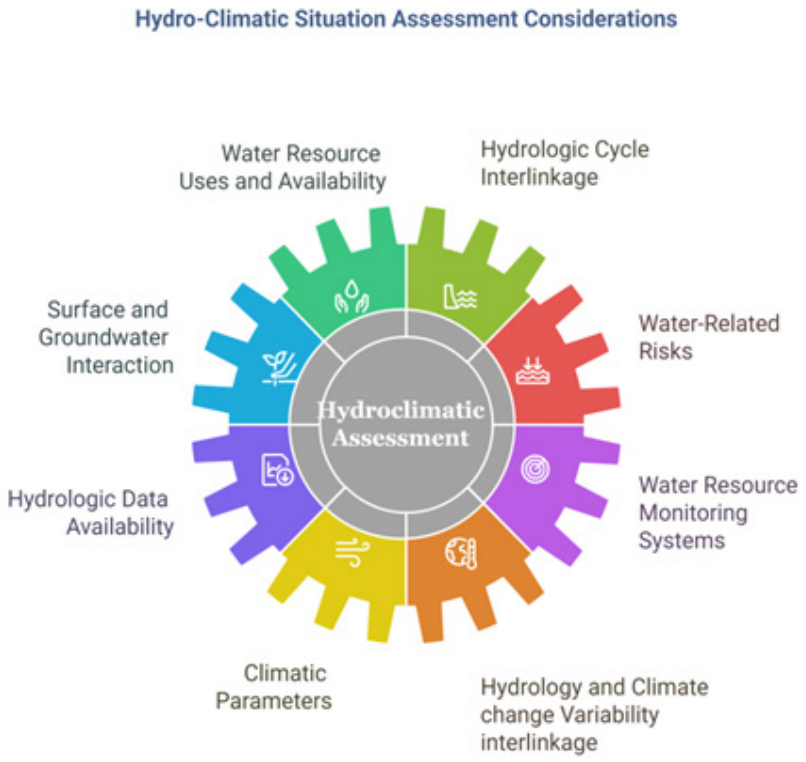


Figure 5. Hydro-climatic situation assessment considerations

5.2.3. Environmental and ecological situation assessment

The environmental values of a basin plan rest on its application to ensure sustainable management of the environment and ecological services that the society and the economy benefits from. Thus, properly addressing these issues in the basin plan forms one of the pillars of IWRM. Environmental and ecological considerations focus on the impacts of water resource management on the natural environment, as well as the need to maintain healthy ecosystems for the benefit of society, the economy, and the environment itself. Therefore, the environmental and ecological aspects of a basin plan are important to justify or measure how the proposed measures in the basin plan are suited to ensure environmental sustainability by addressing ecological health. Key aspects that should be considered, as shown in Figure 6, are:

- Ecosystem

- hydrological environmental flow needs,
- water pollution,
- Flora and fauna and their interconnectivity,
- Ecosystem service values,
- social impact assessment and adaptations to suit current environmental contexts
- Eco-friendly resource use practices
- Application of nature-based solutions
- Resilience to climate change and adaptation

The environmental and ecological considerations can be best assumed in the situation assessment and in the proposition of solutions to strategic questions in the Basin Plan. This has to be ensured in the allocation and optimization of resource uses, in the identification of hotspots and ecological services, in assigning potential ecological measures to resources or water body protection, and evaluation of performance indicators in evaluating basin plan implementation.

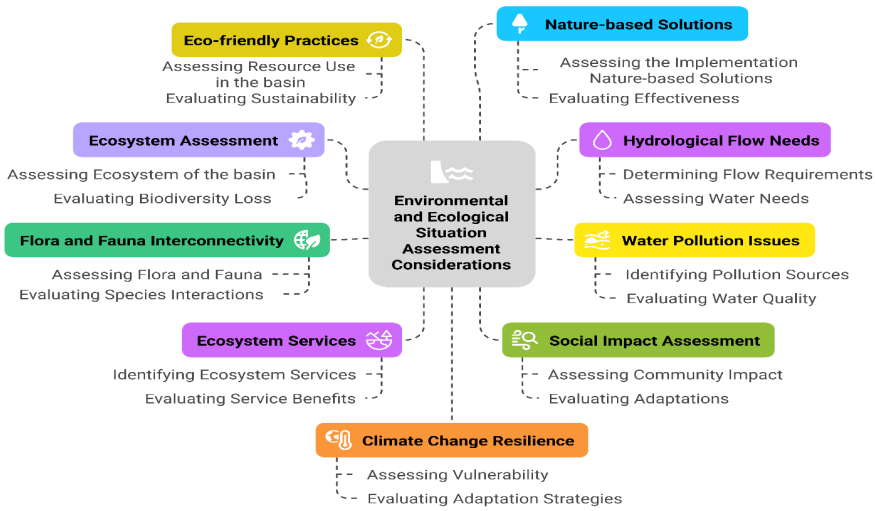


Figure 6. Environmental and ecological situation assessment

5.2.4. Water development and management

This assessment helps in understanding how water resources are used, how their management affects various stakeholders, and how to ensure equitable, efficient, and sustainable water use. Some of the key aspects that should be considered include: -

- the water supply and demand analysis,
- the current water infrastructure,
- the water availability and allocation

5.2.5. Social and economic considerations

The socio-economic assessment of the basin ensures that the Basin Plan addresses the needs, challenges, and opportunities of the communities, industries, and development activities that rely on the water resources in the basin. The assessment should focus on the demographic situation of the basin, the current economic indicators, access to water resources, dependency of livelihoods on water resources, infrastructure, and other aspects.

The aim of considering social and economic considerations in the Basin Plan is to make sure that the water resources management interventions to be taken markedly comply with the social standards and best suit the current and future economic development dimensions of the basin, and the country as well. The key elements to take note of addressing in the Basin Plan in this regard includes, but not limited to, the following:

- The demographic situation of the basin.
- The current economic indicators.
- the current and future government plans and programs to establish sustainable social services across the nations in the basins and to foster green growth and economic developments;
- the current and future socio-economic practices to maintaining the optimization of development and environmental requirements;
- the allocation of the resources for the users and users with participatory, rational and equitable manners across the completing economic uses;

- the local and global divers of social, political and economic movements that impact the water and related resources uses, and the country's advantage towards new or emerging eras of socio-economic developments;
- access to water resources and livelihood dependency on water resources;
- considerations of cultural and religious elements and values.

Figure 7. Socio-economic assessment considerations

The considerations above should answer the basic question of how well the Basin Plan captures the current and future optimized uses of water resources for better economic development and social welfare while sustaining the ecological services from the environment. The Basin Plan reflects these concerns through assessment and analysis of the current and future trends in social and economic developments at national, regional and global levels.

5.2.6. Emerging issues

The globe is in a continuous change and these changes produce impacts either positively or negatively on the resource base. The water resource is the major resource subjected to dominant global changes like climate, population, economy

and technology. The local socio-economic and environmental changes also depend on the global scale pressures, and thus the Basin Plan should adequately shoulder the observed and emerging issues at appropriate scale. To make the plan resilient to any change, in this assessment it should be considered any emerging issues that may occur globally and domestically. As shown in Figure 8 the key aspects that should be considered are: -

- new political orders in water and energy resources use;
- any policy change that may arise from the government;
- any global social, economic and environmental influence;
- technology advancements;
- climate risks and uncertainties;
- biodiversity and ecological changes;
- Increased socio-economic development impact on water, land and energy-related resources,
- human health shocks

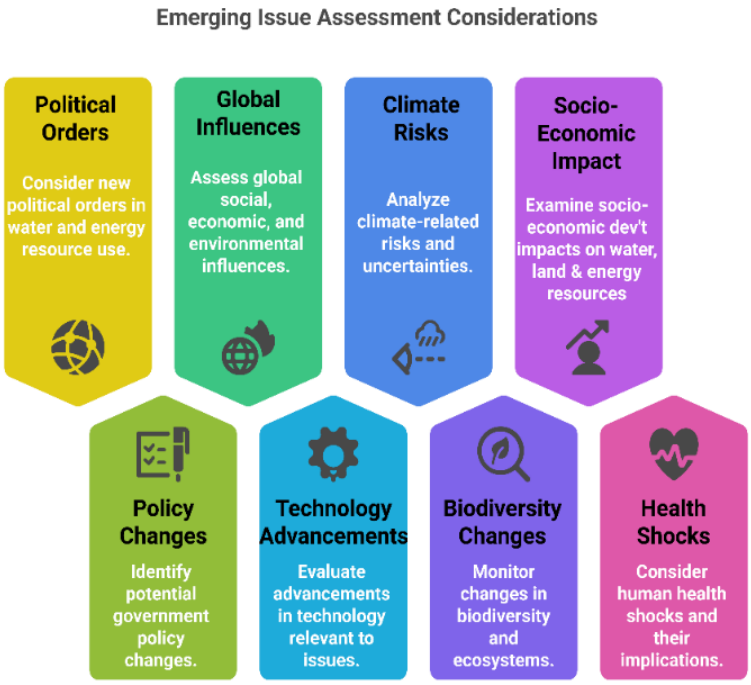


Figure 8. Emerging issue assessment considerations

5.2.7. Legal and regulatory instruments

The Basin Plan requires background to be initiated, formulated, envisioned and executed at an appropriate scale. The legal and regulatory considerations are thus required to establish a legitimate purpose and role for preparing and implementing the Basin Plan. It also requires regulatory provisions to envisage the Basin Plan implementations so that preparations can directly be linked to the implementations. Thus, the assessment ensures that the planning process is aligned with existing legal frameworks, complies with relevant regulations and mandates, and identifies gaps or challenges that may hinder effective water management. A comprehensive assessment ensures that the basin plan is implementable with the changing of institutional arrangements. Key aspects that should be considered are: -

- The international conventions and commitments that Ethiopia subscribed (e.g., SDG, Agenda 2063, etc.)
- The national policy, proclamations, regulations, plans, etc., relevant to the water sector development and management.
- Regional legal instruments, community laws and indigenous norms applicable for the implementation of the basin plan;

The legal and regulatory aspects have to be related to the legitimacy of institutions in basin plan and coordination, the availability of legal enabling environments to initiate and endorse the plans and the role of institutions by law to promote, execute and support basin planning and implementation. The process of ensuring the incorporation of legal and regulatory instruments in to the basin plan preparations requires continuous follow-up and adjustments based on assessment and evaluation of Basin Plan implementation, monitoring and evaluations. The task of basin plan review and updates can be the appropriate state of incorporating new legal and regulatory dimension, and this has to be supported by adequate performance evaluations and assessment of changes in the institutional setups.

5.2.8. Institutional arrangement

A situational assessment of institutional arrangements in basin plan preparation involves evaluating the roles, responsibilities, and interactions of institutions involved in managing water resources within a basin. This requires understanding their mandates, strategies, and the extent to which these align or conflict across

various sectors. In this assessment, institutional mandate overlap should also be assessed. Thus, as shown in Figure 9, some of the key aspects that should be considered in the preparation of the basin plan include:

- Assess and map the key water and water related organizations
- Review the legal and operational mandates of each institution, laws, policies, and regulations defining institutional responsibilities, examine overlaps, gaps, or ambiguities and enforcement capacities
- Assess and evaluate how institutions collaborate across sectors and the integration of water management activities with other key sectors
- Review sector-specific and cross-cutting strategies for their alignment and integration in the basin plan.
- Assess and evaluate the technical, financial, and human resources of institutions;

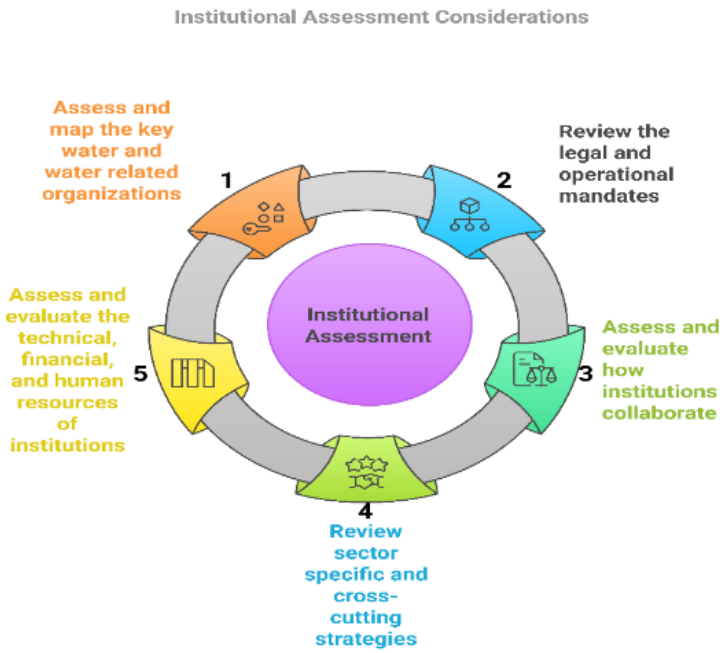


Figure 9. Institutional arrangement situation assessment critical considerations

5.2.9. Best practices and innovative technologies

The water resources management in Ethiopia can be contextualized as water and water-related developments and services requiring capacity development, high-level integration and better financing. In this regard, technology plays a significant role in establishing systems, simplifying functions, controlling risks and access for water resources management services.

The purpose of technology integration in the Basin Plan is, thus, to support quality and sustainable water services through establishing modernized systems, enhancing linkages, complementing data and information gaps, and promoting access to water and climate services. Also, the advancements in the water resources planning and management can be best supported and maintained by regular review of technology developments in the aspects of promoting real time information and decision making, easing water resource monitoring and deploying the opportunities created from the Big Earth Data and Artificial Intelligence (AI) for better system capabilities.

The assessment of technological integration should focus on addressing the current and future modern technologies for effective and sustainable analysis of trends, proposing modernized systems in the activity lists, and in the mitigation of potential risks and uncertainties associated with hydro-climatic conditions. Thus, the use of AI for Integrated Water Resources Management, is crucial to address the issues of modernization, for controlling uncertainties, for enhancing the water efficiency, to improve access to water services and building resilience to changing circumstances at global, regional and national levels related to water, climate, environment and economy. Integrating advanced technologies like AI into the planning and management of water resources is important to continuously assess and evaluate the advancement in the technology in the water resources management and climate services and ensure the existing systems support future technology developments. The position of the country to host technology features has to be always referred and adjustments to technology improvements have to be based on the national laws and regulations.

5.2.10. Water-related risks

The assessment of water-related hazards ensures that the plan adequately addresses the risks posed by natural hazards such as dam safety issues, flood-related issues, drought issues, and landslide issues. These hazards can have devastating impacts

on both the natural environment and human population and, therefore, must be comprehensively integrated into the Basin Plan to protect water bodies, water infrastructure, human lives, and ecosystems. The key aspects that should be considered are: -

- Assess and identify natural and anthropogenic water-related risks that could directly and indirectly impact the basin;
- Assess the basin's vulnerability to identified water-related risks;
- Analyze the likelihood and potential impacts of identified risks and quantify the risks using probability and impact assessment.
- Mapping of the risk within the basin using GIS, Remote Sensing or other similar tools.

5.2.11. Adaptive management opportunities

Water resource management works in a dynamic environment and this reflects the need for a promoting a system that works in a flexible environment. The aim of considering adaptive management is to ensure that the planning process, the plan itself and its implementation accommodates changes in the bio-physical, socio-economic and political environments at all levels. The Basin Plan should remain effective in the face of a changing environment and evolving institutional arrangements. Adaptive management is a flexible and iterative approach that helps to adjust strategies based on new information, changing conditions, and evolving risks over time to address uncertainties such as climate change, socio-economic shifts, and evolving governance structures. This assessment is particularly important for preparing a resilient Basin Plan, one that can adapt to changing environmental, social, and institutional conditions while continuing to meet the water needs of both human populations and ecosystems. The Basin Plan has to address these issues well in its content and orientation, and it has to imply these through strategic measures and proposed means to planning, monitoring, evaluation, learning and communication.

In addition, global issues like climate, economy and politics drive the changes in the water resources management orientations, and the Basin Plan needs to adequately address them through the provision of enabling environments, institutional setups, technology utilization, and eco-friendly measures and services. In this case, the basin plan promotes the establishment of robust systems, resilient ecosystems, and stable institutions and enabling environments.

5.2.12. Cross-cutting issues

Water users and managers are not all the same and are made up of women, men, children, people with disabilities, and people from different ethnic backgrounds, youth, the elderly and other groups. All these water users have different water needs and responsibilities with regard to water management. Especially, the guiding principles of the 1992 Dublin Statement espouse that 'Women play a central part in the provision, management, and safeguarding of water. This pivotal role of women as providers and users of water and guardians of the living environment has seldom been reflected in institutional arrangements for the development and management of water resources. Acceptance and implementation of this principle require positive policies to address women's specific needs and to equip and empower women to participate at all levels in water resources programs, including basin plan preparation, implementation and decision-making, in ways defined by them. Thus, assessment of women's role in water use, access and dependency is crucial for effective implementation of basin plan.

5.3. Issue Identification and Prioritization

After assessing and analyzing the situation of the basin, it can be clearly identified that there would be different water resource-related issues, problems and challenges. Thus, providing essential information on the current status of the basin and providing the opportunity of narrowing down the focus of the plan, and developing an understanding of the key management concerns is essential.

After the specific issues that are affecting a water source have been identified, it will be prioritized by considering a number of factors, such as the severity of the problem, the potential impact on human health and the environment, and the cost and feasibility of remediation. Prioritization is required to optimize the limited resources available at any given time for specific purposes.

5.3.1. Tools and methods for issue identification

Problem analysis

The process of identifying and prioritizing issues within such a plan helps to ensure that critical concerns are addressed first and resources are allocated efficiently. The key considerations will be used for identifying and prioritizing the thematic issues are the following: -

Analytical Tools

When identifying key issues and challenges in basin planning, different analytical tools and techniques can be deployed. Some of these tools, that has to be developed in close consultation with stakeholders, may include:

- **Problem and/or Objective Tree Analysis**

The problem tree analysis method will be used to prioritize basin issues and identify the root causes and triggers of these challenges. This tool can be used to visualize and understand the causes and effects of specific issues within a basin. The process would start by identifying the issue, analyzing the trend to identify the underlying causes that lead to the thematic issue, identifying the effects of the thematic issue, and connecting the causes and effects in a tree structure, showing how different factors contribute to the thematic issue. Thus, this clear illustration helps stakeholders understand the root causes and impacts of problems, which helps identify areas for intervention and makes it easy for thematic issue prioritization.

- **Multi-Criteria Analysis (MCA)**

MCA is another decision-making tool used to evaluate and prioritize thematic issues based on multiple criteria, including environmental, social, economic, and technical factors. The main role of the techniques is to deal with the difficulties that human decision-makers have been shown to have in handling large amounts of complex information consistently. The process would first define or set the criteria that are important for decision-making, then assign relative weights to each criterion based on its importance to stakeholders and the overall basin plan vision and goals. Thus, by using this analytical tool, different management options or solutions for each thematic issue are evaluated, and for each issue, scores are assigned according to how well they meet the criteria. Then, an overall score is calculated to rank the options. A ranked list of issues or solutions based on predefined criteria, helping decision-makers and stakeholders to prioritize critical thematic issues.

- **Modeling**

For effective identification of the current and future thematic issues of a basin there are different analytical models that can be used. Thus, the models will help to predict and analyze issues such as water availability, pollution spread, habitat

loss, and so on. There are different kinds of models that will be used to identify thematic issues and prioritize them depending on the model result. Some of them are hydrological models, water quality models, ecosystem models, etc. Model outputs can highlight areas with high vulnerability and predict how the basin will respond to different management strategies.

- **Scenario Development**

Scenario development as an analytical tool helps to explore different future scenarios and their implications for water resource management in the basin, and supports decision makers to understand potential challenges, future scenarios and opportunities. The process is first assessing the key drivers affecting the basin and developing alternative scenarios based on different combinations of the key drivers. Then evaluate how each scenario would affect the key issues in the basin. Finally, a set of different potential future pathways that can guide the planning and implementation of the Basin Plan will be developed and used to prioritize thematic issues under different circumstances.

- **Integrated Approach**

Integrating the above listed analytical tools will give a better result and this approach provides a holistic understanding of the thematic issues in the basin, ensures that decisions are evidence-based, and helps to prioritize top action areas that will have the most significant positive impact on water resources. It can be started from stakeholder inputs, opinions and concerns. Then, by using problem tree analysis, identify thematic issues and their cause and effect; then, by the application of modeling, simulate different scenarios to understand the potential outcome and vulnerability; then, by using multi-criteria analysis, evaluate and rank the identified thematic issues based on a set of criteria and then consider various future scenarios and how they affect the prioritization thematic issue and finally by combining all insights the thematic issues can be well prioritized to thematic actions. This can be clearly seen in Figure 10 below.

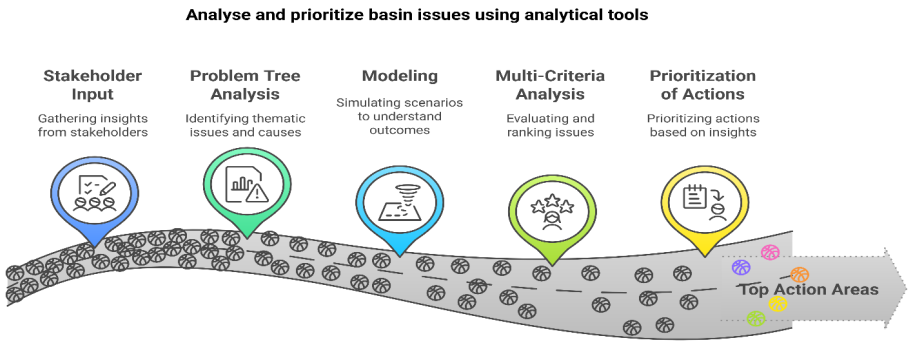


Figure 10. Integration Approach for Choosing Top Action Areas

5.4. Basin-level and sub-basin-level Issue Identification

There are different thematic issues that will have an impact on the basin water resource. The thematic issues that may be pertinent at the basin level may not represent the critical issues that prevail at sub-basin level. Thus, identifying issues separately at a basin level and sub-basin level is mandatory. To prioritize thematic issues, one of the requirements should be identifying the thematic issues at a basin level and sub-basin levels.

5.5. Identify Action Areas

After identifying and prioritizing the thematic issues, the top five critical actionable areas have to be prioritized. Thus, the main basin plan's aim would be to solve the prioritized action areas that can be implemented during the plan period. The remaining unselected thematic issues will also be addressed in the next planning phase of the basin plan.

6. The Basin Plan

6.1. Introduction

To formulate the basin plan, issues related to water resources management need to be first identified, defined and prioritized with the effective engagement and participation of key stakeholders and using appropriate analysis tools. During this process, with stakeholders' input and technical analysis, the potential strategy will be identified and prioritized to resolve water resource management issues in the basin, sub-basin, and watershed or hot spot areas.

The collection of these identified and prioritized strategies and respective activities to be implemented, in sequence with different timeframes will be then developed. Once, the basin issues are prioritized and different strategies are developed and aligned with the vision and goals the comprehensive basin plan is prepared consensus shall be reached among the implementers and is ready for approval by government and that there be a legal provision for all levels of government federal, regional and basin level to adhere to such approved plan. This guide further provides the following critical conditions to be considered while developing the basin management plan.

6.2. The Basin Planning Process

6.2.1. Planning team establishment

Who actually drafts the basin plans? The person taking on this responsibility should be aware of the outputs that are needed at every step of the basin planning process. Consultants are often not sufficiently in touch with the realities of the basin and may produce a plan that is too idealistic. It is anticipated that government agencies and the basin organization would carry out the strategy. The team shall be established comprising basin organization and key stakeholder experts, to formulate the basin plan. The team can also call for subject matter specialists from research centers and universities to conduct analytical work like modeling and scenario development. Basin organizations are fully responsible for the coordination of the basin plan development process since they are fully responsible.

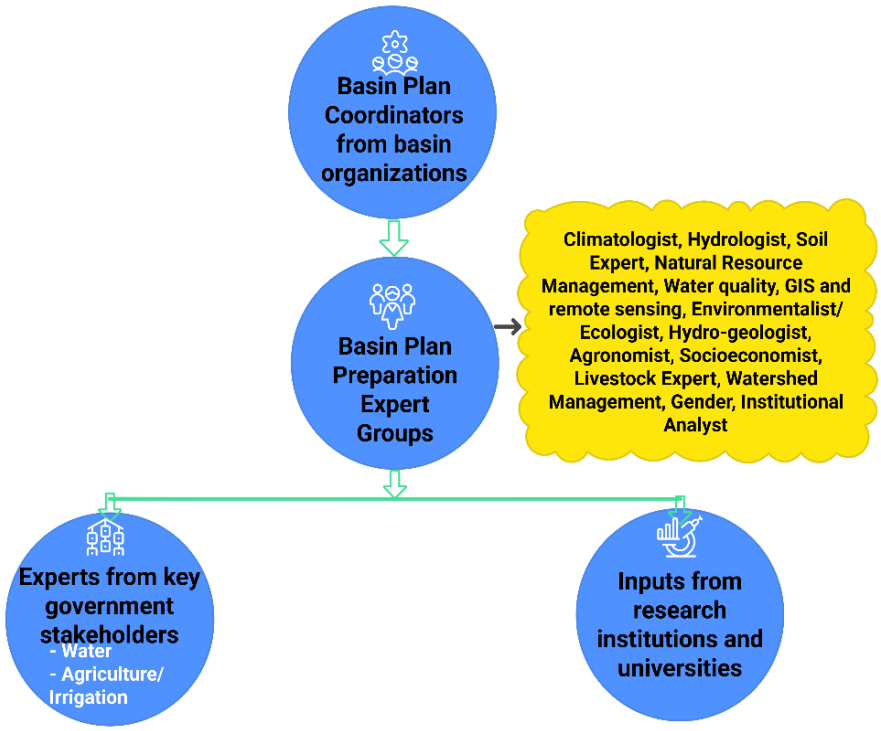


Figure 11: Proposed Basin Plan Team Composition

This guide provides the possible team composition of the basin plan development team, which is depicted below:

6.2.2. Structure of the basin plan

The basin planning applies a hierarchy of vision, goals, and objectives, with a strategy and supportive actions for each objective, as illustrated in Figure 12. As can be seen from the flow chart, development of the basin plan is built on a vision of the basin plan for the basin and associated thematic plans and strategic actions.

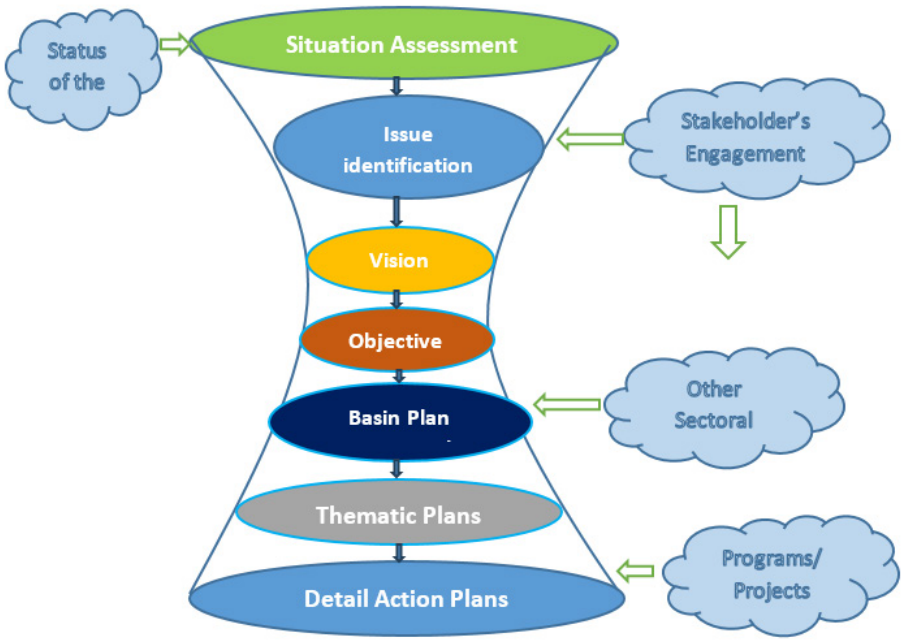


Figure 12. Structure of the basin plan

6.2.3. Develop shared vision

To effectively manage water resources within a basin, stakeholders must establish a shared vision for its future. Understanding the underlying issues of the basin that cause water-related problems helps to build a shared Basin Plan vision and commitment to make that vision come true. Having a vision of what the basin plan will be in the future can help to determine what measures have to be taken from the perspective of a sustainable water resources management. Working on a long-term vision for the basin plan is an essential tool to reach an agreement between basin organizations and stakeholders on objectives and then, to plan the necessary actions to progressively reach these objectives.

This guide further advises basin plan vision to be oriented to a given time period, usually about 15 - 20 years, and should not be very long. The vision should not be too vague and unachievable. Preferably it should be framed in the context of the national vision for sustainable development.

6.2.4. Basin plan goal(s)

Once the nature and origin of the basin issues or problems are identified, the next step is to define the basin management goals for the basin plan and the anticipated conditions expected from the implementation of the basin plan. The basin situation analysis report should present the basin issues and problems and prioritize those requiring urgent attention. The situation analysis and basin issue prioritization open the door to possible solutions and allow them to be considered before the basin plan is developed and strategies are devised.

Goals are. Therefore, an agreed medium and long-term projection of what the basin water resources situation will ideally be. There might be more than two goals and each should reflect a given issue (problem or opportunity), address the main changes required to make the transition to sustainable water resource management, be expressed in a way that is broad enough to encompass all aspects of the basin issue and ensure 'buy-in' by all relevant stakeholders, but also specific enough to allow measurable targets to be defined.

It is equally important to build a consensus among relevant stakeholders and gain their buy-in through coordinating workshops to discuss the goals and long-term visions. The defined goals also need to be aligned with the national water management strategies.

6.2.5. Developing basin plan strategic actions

Developing an action plan for the basin plan at different levels is necessary to initiate practical measures for changing the status quo, ensuring that all actions are coherent and suitable for following the basin plan strategy to achieve the identified goal, with a clearly identified role of stakeholders in the implementation process. This is also critical to build accountability and transparency. Therefore, the development of such an action plan must be initiated by Basin Organizations in collaboration with major government stakeholders, communities, water group users, and the private sector.

Basin plan prioritized actions shall lead to the design of different projects to enhance the basin plan implementation. These interventions can be small or large, depending on the basin plan goal that the intervention aims to achieve. All interventions must be appropriately contextualized and geographically specific to make sure that they respond to the basin issues identified throughout the process.

Implementation is the execution of the project activities identified in the action plan, which is an inevitable step to put the action plan into operation and achieve tangible change and improvements. It is also critical to harness the necessary partnerships with relevant stakeholders who could provide additional support, where necessary, to enable the successful implementation of projects, including the management of the budget and funds.

6.2.6. Basin plan strategy and option development process

Basin planning is a very practical activity. To make a basin plan strategy means to formulate courses of action to realize the integrated water resource management. This means articulating basin plan goals, major means-to-goal actions and responsible parties. It consists of short, medium and long-term measures in support of integrated water resources management. The strategies are expected to be derived from basin situation assessment, identification and prioritization of the water resources issues (opportunities and challenges). Their careful formulation shall ensure the effective implementation of the plan later on. Formulating this basin plan strategy can be conducted using a range of techniques: expert discussions, stakeholder workshops, and application of analytical tools. Goals drive the selection of strategy. Alongside the issues and problems identified in the situation analysis, strategies are suggested.

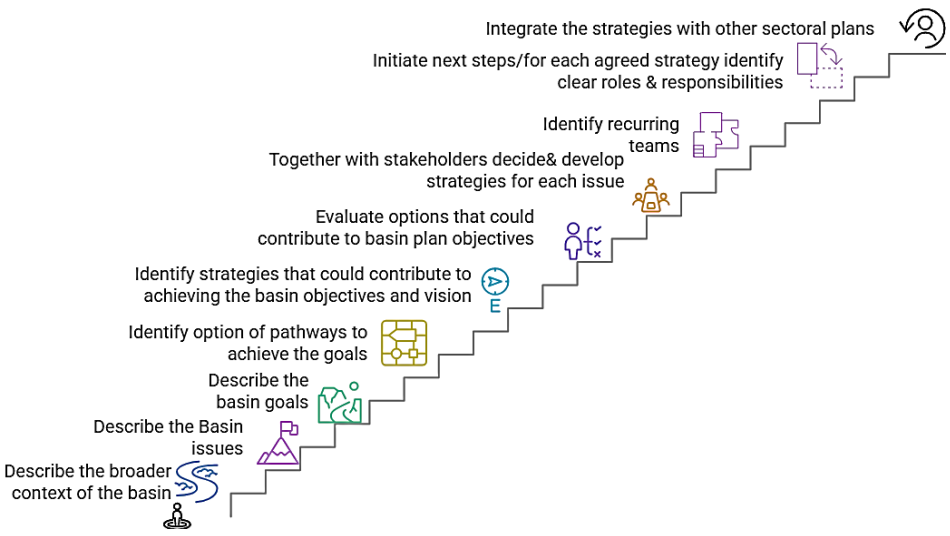


Figure 13. Pathways of strategy development linked with basin issues and options

This guide further provides that the context of the basin plan strategy and option development should consider:

Dealing with trade-offs: is an unavoidable aspect of a basin plan. There are always discrepancies on the management of basin issues and stakeholder interests. Addressing these in an informed and transparent way is difficult but necessary.

- Dealing with the basin plan with the real world: Often, plans are made with idealistic basin plan goals and fail to recognize the reality of critically important factors or constraints. Plans are often governmentally immature and fail to recognize the central role that political decisions take on basin management issues.
- Develop acceptable strategies: is critical to the acceptability of the basin plan and the likelihood of its implementation. For example, if the strategy does not reflect the real problems of the basin water resource that impact the community, it is unlikely to be 'owned' or implemented even if its approach seems logical.
- Multi stakeholder process of consultation: Stakeholder workshops are inevitably important for explaining the basis for, and ageing, key decisions.

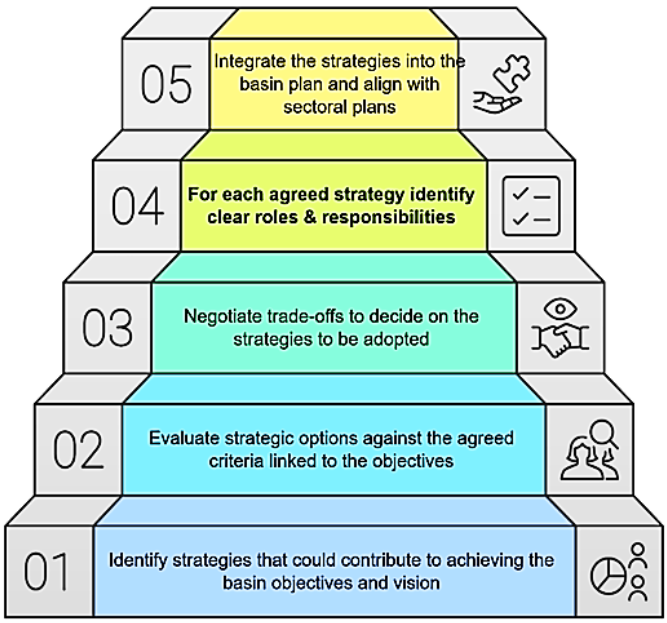


Figure 14. The Basin Plan Strategy option development Process

6.2.7. Thematic basin plans

Basin planning is the process of deciding how to use water resources in a basin, while considering the needs of the environment and the health of the river. A thematic plan is one of the techniques used in basin planning to manage a plan for a basin's water resources. Thematic plans are developed as part of the basin planning process, along with other techniques such as basin situation assessments, prioritization of basin issues, and identifying objectives.

The analysis of pressures and impacts on the water resource is a key step in the basin planning process, which starts with the diagnosis of basin issues, and concludes with the development of thematic plans with prioritized strategies or measures to address specific components of those issues phase by phase. Therefore, the Basin Plan will be made up of a suite of management components and to be classified into different thematic plans. These thematic plans can be water allocation, watershed management, water quality management ,etc. and this work together to be basin plan that creates a sustainable water resource management system.

6.2.8. Timespan of the plan

While there are some common themes and principles that have emerged, there is no universally applicable template or roadmap for river basin planning and fixing the time horizon. The decision to fix the time frame of the basin plan should be aligned with the vision of the basin plan, which has a long-term context. On the other hand, implementation of the basin plan may take place on a step-by-step basis, in terms of basin plan scope and the vision. The scope, timing, and content of strategic measures can be adjusted according to experience. This offers room for change, improvement and process adjustment, provided that the proper bases for sound decision making are established.

Because it is not easy to see the impact of the basin plan within a short period, the plan will normally be relevant for several years. This guide therefore provides a recommendation to develop a 15-year basin plan. While the strategy should be flexible enough to adapt to changing political, economic and environmental conditions, it may be useful to agree on a timeframe for regular review and updating. This guide therefore recommends revise and update their strategies every five years, but may do so more often during periods of rapid change.

6.3. Defining Planning Units

The Ethiopian water resource management strategy designates the basin as the fundamental planning unit for integrated water resource management. For transboundary basins, plans must ensure equitable benefits for all participating states, with the collective gains exceeding those of individual actions. A successful integrated basin plan delivers net benefits from water resource development to all riparian communities.

The selection of a planning unit is primarily determined by the basin's complexity and the urgency of its water resource management challenges. While basins are the primary unit, this guide recommends utilizing smaller units, such as sub-basins or catchments, for large and complex basins. Furthermore, to address diverse water resource management issues, basin plans can be developed at the basin, sub-basin, or catchment level. Priority should be given to critical issues requiring immediate action.

6.4. Development of Key Performance Indicators to Basin Plan Implementation

Key Performance Indicators (KPIs) are essential for assessing basin plan implementation. They quantify the success of a plan in achieving its objectives, track progress, and ensure compliance with standards (e.g., water quality, ecosystem health).

KPIs are intrinsically linked to basin plan goals, objectives, and values, serving as crucial tools to inform management decisions. The selection process, as outlined in this guide, is designed to be adaptable, allowing for tailoring to specific purposes and available resources.

Several key factors influence the selection of KPIs. Firstly, stakeholder workshops are crucial, where expert stakeholders identify core values, potential threats, and initial KPIs, which are then refined through collaborative discussion. Secondly, guiding principles emphasize the importance of balancing the number of KPIs to ensure meaningful interpretation and efficient resource utilization, avoiding both excessive and insufficient indicators. Finally, flexibility is essential, allowing for the adaptation of KPIs to specific sub-basin needs and the replacement of irrelevant indicators with suitable alternatives. This framework, incorporating stakeholder input, balanced principles, and flexibility, facilitates the selection of

relevant and effective KPIs for basin plan evaluation.

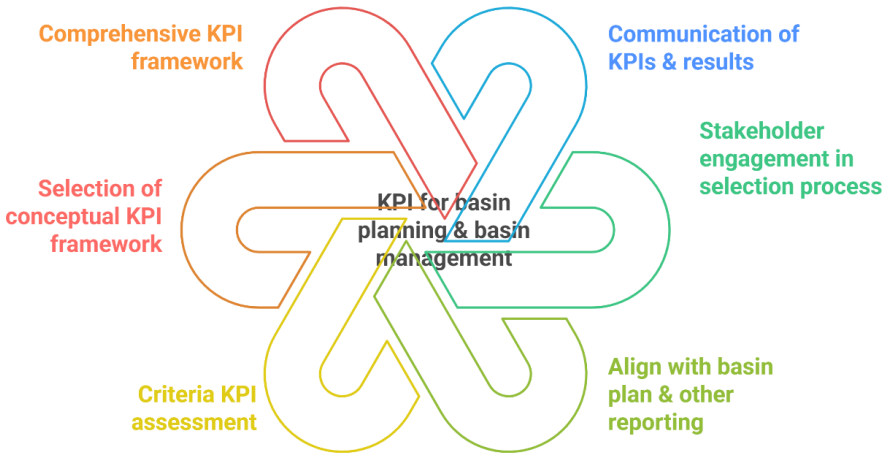


Figure 15. Basin plan KPI framework

7. Implementation Strategy

7.1. Critical Considerations

7.1.1. Stakeholder engagement

Successful implementation of the basin plan's strategies and activities requires active participation from diverse stakeholders. This necessitates clear institutional arrangements, defined roles, responsibilities, accountability, and consistent stakeholder engagement. A framework outlining operational roles and responsibilities should be established, tailored to the basin's specific context. This may involve creating a basin organization through legislation and fostering strong collaborative relationships between national and regional water resource management organizations

7.1.2. The Community's and private sector role

The community plays a vital role in the implementation of the basin plan by driving behavioral change and tracking compliance. Through education and awareness programs, community-led initiatives, and advocacy, community members are empowered to adopt sustainable water management practices. By forming monitoring groups, participating in data collection, and providing feedback, the community ensures that compliance with the basin plan is tracked effectively. This collaborative approach enhances the effectiveness of the basin plan, promoting long-term sustainability and equitable water resource management.

By clearly stating these roles, the community can be effectively engaged in both promoting sustainable behaviors and ensuring compliance with the basin plan.

7.1.3. Resources for plan implementation

Successful plan implementation requires adequate resourcing, institutional arrangements, accountability and reporting. A framework should be established, setting out operational responsibilities, budget and accountability for implementation and review. The resource arrangement from action owners, stakeholders, and partners, for the implementation of the basin plan should be clearly stated for an effective implementation process, ongoing meaningful and transparent engagement. In addition, the basin plan has to indicate all possible revenue generation mechanisms for its effective implementation.

7.1.4. Regulation, compliance, and enforcement

Effective implementation of the basin plan hinges on robust regulation, compliance, and enforcement mechanisms. Establishing the basin plan in legislation is crucial, providing a legal framework for compliance. Given that basin organizations within the federal system typically lack direct regulatory enforcement mandates, they are best suited for joint technical projects, monitoring, auditing, and reporting.

To ensure effective enforcement, federal and state-level agreements must clearly define responsibilities and obligations. Ideally, an independent body, separate from political influence, should handle enforcement decisions. Enforcement measures must be fair, transparent, equitable, and proportionate to the severity of any legislative breach.

7.1.5. Theory of Change

After going through the previous stages of basin planning and reaching the implementation strategy development stage, developing a Theory of Change (ToC) for the basin plan is required. ToC is a written description or diagram explaining how a series of actions and activities will lead to specific outcomes and eventually may indicate the impact, depending on the time span of the plan. It's a method that uses causal analysis to illustrate how the basin plan is expected to create change. The guideline shall clearly indicate its purpose. The ToC to be developed needs to be clear and understandable by all levels of stakeholders. It must be generated from the basin plan itself and shall contain the following:

- **Goals**: The desired long-term objective of the program and high-level outcomes;
- **Preconditions**: The conditions that must be in place for the goals to occur;
- **Requirements**: The requirements for the program;
- **Assumptions**: The assumptions made about the program;
- **Interventions**: The activities or interventions of the program;
- **Indicators**: The indicators of the program.

7.1.6. Data and information accrual communication strategy

A lot of raw data and information is collected and generated during the preparation of the basin management plan. Also, during the implementation of the basin plan, data will be collected to assist in the monitoring and evaluation process of the implementation. Since these data are very helpful for the planning and management and use of water resources and make the implementation of the basin plan successful, the basin plan should clearly establish an information exchange and management system that ensures the appropriate information is collected, standardized, revised and made accessible.

Information exchange and management arrangements within a basin plan should essentially consider several key factors to ensure effectiveness and efficiency. Firstly, stakeholder analysis is crucial to identify all relevant parties, understand their information needs, and establish clear communication channels. Data standardization and accessibility are vital to facilitate seamless integration and user-friendly dissemination of information.

Security measures must be implemented to protect sensitive data, alongside clear protocols for data sharing to respect confidentiality and privacy regulations. Regular updates and feedback mechanisms should be in place to keep stakeholders informed and allow them to contribute to the improvement of data quality and communication processes. Capacity building through training and resources is essential to enhance stakeholders' ability to manage and interpret data.

Finally, integrating the data management system with existing platforms and establishing robust monitoring and evaluation frameworks will ensure transparency, accountability, and continuous improvement in the communication strategy. By considering these factors, the basin plan can achieve effective stakeholder engagement and data-driven decision-making.

During the implementation period of the basin management plan, it is necessary to disseminate the basin plan in local languages and other easy-to-understand info graphics with respect to regional and city administrations where it will be implemented so that the community can understand it easily.

7.1.7. Capacity development during the implementation

Capacity development is an important part of implementing basin plans because it can help improve the efficiency and effectiveness of organizations, individuals,

and societies. The implementation of the basin plan is a novel process to Ethiopia and involves a wide range of stakeholders' participation. Effective implementation of the basin plan requires same or close understanding on the basin plan to ensure the effective implementation of the base plan.

Therefore, it is necessary to make the implementation of the basin plan effective by identifying the capacity gap of the participating bodies in the implementation process of the basin plan, designing and implementing a strategy to fill the gap, and evaluating the benefits it brings.

7.2. Guidelines Required During the Implementation

Supporting the basin plan implementation process with various guidelines ensures a structured and consistent approach, promoting compliance with legal requirements and integrating best practices. These guidelines enhance stakeholder engagement, effective communication, risk management, and monitoring and evaluation, enabling continuous improvement. They also provide strategies for adapting to changing conditions, ensuring the plan remains relevant, resilient, and contributes to sustainable water resource management. By offering a clear framework, these guidelines help coordinate efforts among stakeholders and enhance the overall effectiveness and efficiency of the plan's execution. Hence, the following guidelines are essentially developed and basin plan implementation process is essentially accompanied by the following basic guidelines.

Basin plan implementation guideline: aimed to ensure the basin plan's effective and efficient execution. The guideline is required to provide a structured framework that outlines the steps, responsibilities, and processes needed to achieve the plan's objectives. It helps in coordinating efforts among various stakeholders, ensuring compliance with legal and regulatory requirements, and promoting best practices in water resource management. Additionally, the guideline facilitates monitoring and evaluation, enabling continuous improvement and adaptation to changing conditions. By providing clear instructions and support, this guideline enhances transparency, accountability, and stakeholder engagement, ultimately contributing to the sustainable management of basin resources.

Stakeholder Engagement Guidelines: Focus on involving all relevant stakeholders in the planning and implementation process. They provide strategies for effective communication, collaboration, and conflict resolution among stakeholders.

Monitoring and Evaluation Guideline: establish frameworks for monitoring and evaluating the progress and impact of the basin management plan. It includes indicators, data collection methods, and reporting procedures to ensure accountability and continuous improvement.

8. Monitoring, Evaluation, Learning, and Adaptation

8.1. Introduction

A key element of successful basin planning is to establish clear monitoring and evaluation of plan objectives, outcomes, and targets. Effective monitoring and evaluation of the basin plan is critical to ensuring its objectives are achieved. A monitoring, evaluation, reporting and learning (MERL) framework is used to track the implementation and outcomes of the basin plan and it should feed back into basin assessments and plan revisions as needed. The framework needs to be an integral part of basin planning from initiation onwards. Monitoring and evaluation involve:

- **Monitoring the process of implementation**: To ensure that the actions outlined are being taken and that resources are being allocated and used effectively;
- **Monitoring the outcomes of those actions**: In terms of investments in infrastructure and changes in policies, institutional frameworks, management instruments, and financing.
- **Evaluating the progress**: Towards the achievement of goals and objectives;
- **Using the information gained for learning**: This is used to refine a project, program, policy, plan, or strategy and to inform evidence-based decision-making at different levels—from national planning to water user behavior (Ground Water Partnership, 2006).

A detailed Monitoring and Evaluation Guideline needs to be developed following the endorsement of the basin plan.

8.2. Critical Considerations

8.2.1. Objectives

The monitoring and evaluation objective of a basin plan is to track progress toward the plan's sustainability targets. Proper documentation of lessons learned will help make necessary adjustments and adaptations to the plan. Depending on the basin situation, the clear objective of MELA is agreed upon and understood by the community and stakeholders.

8.2.2. Monitoring and Evaluation

Monitoring and Evaluation (M&E) Bodies and Their Roles and Functions

A basin plan M&E shall indicate responsible bodies to collect and manage data related to the water implementation of the basin plan and monitoring and evaluation activities. These bodies need to come from all levels (national, regional, basin, local) and may undertake a limited or extensive range of monitoring and evaluation activities, depending on their mandates and capacities. When setting up or reforming monitoring and evaluation bodies, a good understanding of their mandates, influences, and their level of engagement helps to ensure that monitoring and evaluation bodies provide relevant services to support evidence-based decision-making. Apart from public institutions, the list of M&E bodies may include the private sector, research institutions, civil society organizations, or other non-governmental organizations that also produce or hold relevant data. The role assignment shall indicate the extent of their involvement based on their mandates. The roles of the monitoring and evaluation bodies shall also shed light on the socio-economic factors that influence the basin plan.

Monitoring Frequency and Methods

Basin plan monitoring frequency depends on basin plan objectives and purposes, the basin's situation and available resources. Therefore, it is required to define the purpose of M&E, the nature of the basin factors influencing monitoring frequencies, and available resources for M&E. Depending on these controlling factors, the frequency of M&E of a basin plan may include annual and five-year evaluations, as well as periodic reviews and updates. Although short-spanned M&E (at least every three years) is required to make reviews and updates to

the plan, a five-yearly M&E is required to make a comprehensive assessment of what's working and what needs improvement. Quarterly, biannual, and annual M&E works are required to make adjustments and corrections to annual action plans. Preparation of the list of what to monitor will frame the M&E activities. The list may include: Stakeholders and community engagement, compliance of projects and programs with the basin plan and policy and laws, water use and allocation, the planning and delivery of water for the environment, functionality and status of hydro-met monitoring, water quality, impacts on Basin communities and industries, river operations.

Apart from the monitoring frequency, the M&E plan for a basin plan shall indicate methods and tools for M&E. Basin plan M&E systems assess the achievement of planned measures against set objectives, KPI and the Theory of Change, and compliance. The plan shall also incorporate monitoring of stakeholders' engagement, which is required to achieve the objectives of the stakeholder engagement strategy. Emphasis shall be given to the prevalence of accountability, transparency, and water integrity during the implementation of the plan and funding of the M&E operations. Therefore, it is important to develop an M&E plan and design a monitoring and evaluation system on which M&E work will be based Required monitoring tools may include the Public Interest Framework, analytical online and offline tools, FGD, etc.

Learning, Adaptive Management, and Incentive Mechanisms

A basin plan guideline assumes that a basin plan works in a dynamic environment, reflecting the need for a promoting system that works in a flexible environment. This requires the introduction of adaptive management to ensure that the planning process, the plan itself, and its implementation accommodate changes in the bio-physical, socio-economic, and political environments at all levels. The core elements to consider in addressing changes in the water resources and management setups are related to the flexibility of systems, adaptability of potential measures, and availability of learning and feedback mechanisms. The basin plan has to address these issues well in its content and orientation, and it has to imply these through strategic measures and proposed means of basin planning, monitoring, evaluation, learning, and communication. The process of 'adaptive management' needs to respond to what has been learned and critically evaluate gaps in implementation or objectives not achieved.

Reporting, Data Sharing and Information Management Arrangements

The basin plan needs to indicate reporting mechanisms of the M&E against indicators of plan performance; and stakeholders' engagement. These may contain all encountered setbacks, success stories, and lessons learned. Evaluation of stakeholder engagement can be done at the middle and end of the project. It is also important to develop reporting strategy, mechanisms and indicative formats.

During basin planning, a large amount of data and information will be collected. In addition, during implementation of the plan, new datasets and information will be collected. Basin plan implementers, decision-makers and other water and land users in the basin need to have timely and continuous access to reliable, up-to-date, and relevant data and information to assess the success of the basin plan or to plan their water use. The basin planning guideline shall indicate means of data and information quality assurance, management, and sharing mechanisms to ensure that all relevant data is collected, standardized, reviewed, and made available.

Incentive/disincentive mechanisms are one of the important elements to be considered in basin plans. A basin plan shall list issues, misdeeds, and good achievements that need to be deemed as discouraged or incentivized. Incentive mechanisms encourage stakeholders to act beyond the confines of their regulatory authorities to meet the goal of the basin plan. It also helps to promote economically efficient water use patterns and provides a revenue source. Incentive mechanisms may include targeting the programs to particular areas or populations, reducing transaction costs, and providing pro-poor premiums and subsidies and other economic incentives.

8.2.3. Strategic Socio-Environmental Assessment (SEA) of the basin plan

A basin plan is a strategic plan for achieving sustainable use of water and land resources to protect and improve surface waters and groundwater within a basin. Therefore, it needs to set out the current state of the water environment, pressures affecting the water environment, environmental objectives for protecting and improving the waters, measures or actions needed to achieve the objectives and progress since the previous plan. The SEA process ensures that environmental issues are considered during the development of basin plan and made assessments during implementation and take mitigation measures if desired targets are not met.

The SEA of a basin plan shall be designed to ensure that environmental and cultural effects are considered during the development of plans and a clear and transparent process for engaging wider consultees within the plan development process and more sustainable decisions and outcomes. Development of SEA for a basin plan needs to be derived from or must align with the Ethiopian environmental policy, directives and guidelines. The SEA for a basin plan shall indicate stages to undertake SEA, procedures to follow, engagement of stakeholders and their roles, as per applicable SEA guidelines. It shall also outline environmental reporting and consultation procedures.

8.2.4. Validation and endorsement

The validation and endorsement process for the basin plan involves multiple stages to ensure comprehensive stakeholder engagement, technical rigor, and regulatory compliance. Before starting the basin plan, the planning process will be started jointly by reaching a consensus on the basin plan with the stakeholders. Next, a first draft of the Basin Plan is prepared with the relevant stakeholders. The initial draft plan will be reviewed by stakeholders and the public, followed by a technical review by experts. After incorporating feedback, the plan will be submitted to the government authority (MoWE) for validation.

Once a Basin Plan is validated, it has to be submitted to the highest decision body (BHC/BC) for approval. Once it is endorsed, all actors must implement a basin plan. Therefore, indicating the stages the basin plan shall pass through before endorsement, the required standard of the document to be endorsed, and the procedures that need to be followed for submission is essential. By following this structured process, the basin plan can gain the necessary validation and endorsement, ensuring broad support and effective implementation. The final validated and endorsed plan needs to be published and communicated to the public, setting the stage for successful implementation.

9. Conclusion

Nearly a decade has passed since the basin plan concept was introduced and the first attempt at basin plan preparation occurred in Ethiopia. Three basin plans have been prepared and agreed upon for implementation, and four others have been finalized and made ready for implementation. However, several factors have hindered the implementation of the former ones, and the implementation of the finalized plans also faces uncertainty. Although an inadequate enabling environment is largely blamed, the basin plan preparation process and the absence of clear preparation guidelines, and strategies for implementation are also major reasons. The degradation of the water resources, the variable state of the climate and its adverse effects, and the ever-increasing demand linked with the need for accelerated growth demand the guidance of a basin plan for efficient and sustainable use of the basin water and land resources. This Basin Plan Preparation Guideline is designed to guide the preparation of a basin plan that addresses the burning need of the nation.

The guideline provides a pathway to sustainability by providing an iterative tool that guides the development and management of basin resources. It is designed to address a variety of water-related challenges and to manage water resources sustainably with the primary objectives of sustainable water management, ensuring an integrated approach and equitable water allocation, protection of the environment, control of pollution, enhancing adaptation to climate change, Economic Efficiency, stakeholder engagement, and capacity building. To attain these primary objectives, the basin plan preparation is expected to pass through the following steps:

- **Initiate -** justify the need for BMP and decide to start the process.
- **IWRM/Basin Resources Mapping** - a preliminary assessment of the resources available that ensures implementation of the envisaged plan.
- **Governance Mechanism -** Ensure the existence of political support at all required decision-making ladders and enabling environments.
- **Situation assessment** – the state of a basin under consideration shall be well understood. The assessment shall also indicate trends and forecasts that should be considered in the basin plan.
- **Planning –** This stage provides options and robust strategies for the implementation of the chosen option.

- **Implementation –** the plan is communicated to all implementing stakeholders, approved and endorsed for implementation. The availability of resources and communications systems is ensured at this stage.
- **Monitoring, Evaluation, Learning, and Adaptation -** Periodical monitoring of the implementation, lessons learned will be documented and used to make necessary adjustments in the plan.

The guideline provides the necessary details required to go through all stages of planning. Preparation of the plan requires high technical skills and capabilities to make the situation assessments, develop strategies, the selection of strategies, implementation and undertake MELA. of the river basin plan. However, active stakeholders, high-level commitment, and political support are determinants for a basin plan to be implemented. Basin plan preparation and implementation are multidisciplinary and multi-sectoral task that demands broad engagement. Experiences from the previous attempts show the prevalence of a high need for basin plans and their implementation.

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Appendices

Annex 1: Table of Contents of a Basin Plan Report

The table of contents of a basin plan should be tailored to the unique challenges and priorities of the specific river basin. As a result, it may vary slightly from basin to basin. However, as per issues addressed in this guideline, apart from titles coming prior to the executive summary, a typical table of contents would include the list shown below.

Executive Summary: summarizes key findings and recommendations of the basin plan, provides an overview of water resource challenges in the basin, and discusses the major goals and objectives of the plan.

1. **Introduction**
    - 1.1. Background
    - 1.2. Purpose and scope of the basin plan
        - 1.0.1. Purpose of the basin plan
        - 1.0.2. Scope of the basin plan
    - 1.3. Basin plan objectives
2. **Basin Plan Initiation and Visioning**
    - 2.1. Drivers for initiation
    - 2.2. Shared basin vision
3. **Basin Plan Preparation Approach**
4. **Description of the Basin**
    - 4.1. Location and physiography
    - 4.2. Hydro-climate and hydrology
    - 4.3. Geology and hydrogeology characterization
    - 4.4. Soil resource characterization
    - 4.5. Land use and land over
    - 4.6. Environmental and ecological description
    - 4.7. Water-resource development and management

4.8. Socio-economic description of the basin

5. **Stakeholder Identification and Mapping**

5.1. Stakeholder identification

5.2. Stakeholder analysis and mapping

5.3. Stakeholder engagement and communication

6. Basin **Situation Assessment**

6.1. Biophysical assessment

6.2. Hydro-climate situation assessment

6.3. Environmental and ecological assessment

6.4. Water development and management

6.5. Social and economic assessment

6.6. Emerging issues in the basin

6.7. Legal and regulatory instruments assessment

6.8. Institutional arrangements and governance systems

6.9. Best practices and innovative technologies

6.10. Water-related risks assessment

6.11. Adaptive management opportunities

6.12. Cross-cutting issues

7. **Issue Identification and Prioritization**

7.1. Basin level and sub-basin level issue identification

7.2. Prioritization of issues

7.3. Identification of top action areas

8. **The Basin Plan**

8.1. Introduction

8.2. Vision

8.3. Basin plan goals

8.4. Basin plan strategic actions (list)

8.5. Theory of change

8.6. Scenario development

8.7. Basin plan strategy and option developments

8.8. Planning units (area)

8.9. Thematic plans

8.10. Detail activity plan

8.11. Basin plan implementation performance indicator

9. **Implementation Strategy**

9.1. Stakeholder engagement strategy

9.2. Communication strategy

9.3. Resources for plan implementation

9.4. Capacity development

9.5. Risk analysis and management

9.6. Regulation, compliance and enforcement

10. **Monitoring, Evaluation, Learning and Adaptation Strategy**

10.1. Monitoring and evaluation strategy

10.2. Learning and adaptation strategy

11. **Strategic Environmental Assessment (SEA)**

Annex 2: Terminology

The meaning of terms in this document is derived from sources such as GIWP, 2013; Murray–Darling Basin Authority, 2012 and definitions provided in national proclamations and the national planning context.

- **Adaptive Management** - Adaptive management in a basin plan refers to a dynamic approach where basin plan strategies are continuously monitored, evaluated, and adjusted based on new information and changing conditions, allowing for flexible decision-making to optimize water and land resources utilization while adapting to uncertainties like climate change and emerging issues.
- **Basin –** a basin is one of the 12 basins defined in the draft proclamation of the BHC.
- **Basin Plan-** A basin plan is a management strategy for a basin that sets goals and measures for developing, protecting, and using the basin's resources. The plan aims to ensure that a basin is healthy and sustainable for the long term.
- **Governance-** Governance in this guide is taken to mean the processes, structures, and institutions by which decisions are made concerning water policy and management and the mechanisms by which decisions are implemented.
- **IWRM Resource Mapping –** an assessment of who is doing what, where, and allocated resources for IWRM-related activities with the objective of basin plan preparation, harmonization of projects and coordination of efforts.
- **Stakeholder-** A "stakeholder in a basin plan" refers to any individual, group, or organization that has a vested interest in the water management and allocation within a specific river basin, including government agencies, local communities, farmers, industries, environmental groups, and indigenous populations, all of whom could be affected by the implementation of the basin plan.
- **Institutional arrangements** - In this guide, 'institutional arrangements' refer to the responsibilities, modes of operation and legal status of various entities and how they relate to one another for the basin plan development and implementation.

- **KPI**- a KPI (Key Performance Indicator) in a basin plan refers to a measurable metric used to track the progress and effectiveness of a water management strategy within a river basin, allowing stakeholders to assess whether the plan is achieving its goals regarding water quality, quantity, and ecological health, often including factors like water availability, environmental indicators, and community satisfaction levels.
- **Vision** - in a basin plan, 'vision' refers to a long-term, aspirational goal that outlines the desired future state of a river basin, aiming for sustainable water management that balances environmental health, social well-being, and economic development across all sectors within that basin, often emphasizing equitable access to water and collaborative management among stakeholders.
- **Thematic plan** - within a basin plan thematic plan refers to a specific section or focus area within a broader water management strategy for a river basin, addressing a particular environmental, social, or economic theme like water quality, flood control, ecosystem health, or socio-economic development, allowing for targeted actions and monitoring within that specific area of concern within the basin (GIWP, 2013).
- **Basin plan strategy-** strategy in this guide is a framework for managing water resources in a river or lake basin. It sets goals and measures for developing, protecting, and using the basin's resources.
- **Basin plan goal** - a basin plan goal is to sustainably manage water resources for the benefit of communities and industries while protecting the ecosystem
- **Ecosystem services** are the goods and services provided by ecosytem that maintain and improve human well-being.
- **Water-Related Risks** - water related risks are situations involving exposure to dangers related to water including water scarcity, pollution, flooding, and water conflict