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Gender Responsive Water-Energy-Food- Environment Nexus Approach for Local Level Planning in Nepal

A MANUAL

Bharat Kumar Pokharel, Sanju Koirala, Meeta Sainju Pradhan, Nisha Onta, Manohara Khadka and
Santosh Nepal



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Project



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Abbreviations and Acronyms

WEFE	Water–Energy–Food– Environment
GESI	Gender Equality and Social Inclusion
SDG(s)	Sustainable Development Goal(s)
IWMI	International Water Management Institute
NAP	National Adaptation Plan
DRR/M	Disaster Risk Reduction and Management
NTFPs	Non-Timber Forest Products
PPCP	Public–Private–Community Partnership
NGO(s)	Non-Governmental Organization(s)
INGO(s)	International Non-Governmental Organization(s)
CBO(s)	Community-Based Organization(s)
MSF(s)	Multi-Stakeholder Forum(s)
MEAL	Monitoring, Evaluation, Accountability, and Learning
GoN	Government of Nepal
AQAL	All Quadrants, All Levels (Wilber’s Integral Theory Framework)
EFWN	Energy–Water–Food Nexus (as referenced in external literature)
IISD	International Institute for Sustainable Development
FAO	Food and Agriculture Organization (of the United Nations)
COP	Community of Practice
LGBTIQ+	Lesbian, Gay, Bisexual, Transgender, Intersex, Queer (and others)

Summary

This manual was developed in response to the demand from local governments in the Rangun Watershed for a knowledge resource on the Water, Energy, Food, and Environment (WEFE) Nexus approach. The manual presents key concepts and practical guidance for applying the WEFE Nexus approach in watershed planning. It also aims to offer a practical reference to support local authorities in integrating Gender Equality and Social Inclusion (GESI) responsive WEFE principles into their annual planning, budgeting, and policy formulation processes. It is specifically designed for local government representatives and municipal and ward-level staff in Nepal who are engaged in the WEFE sectors. It serves as a practical reference for developing local plans, policies, and activities, as well as for budgeting and implementing them effectively. It is also a valuable resource for NGOs, INGOs, and academicians working in these fields, and serves as a foundational guide for training design and delivery. The content is based on the materials developed and tested during the GESI Responsive WEFE Nexus Approach training for the Rangun Watershed and the WEFE Leadership Workshop in Nepal.

How is this manual structured?

This manual is divided into three parts, each offering readers a structured pathway to learn about, apply, and operationalize the WEFE Nexus approach in practical contexts.

Part I: Understanding the WEFE Nexus Approach

This section introduces the core concepts and principles of the Water–Energy–Food–Environment (WEFE) Nexus. It elaborates on the Nepalized concepts of “**12 Ja**” and “**17 Sutra**”, illustrating how local cultural and ecological values align with the Sustainable Development Goals (SDGs). The section also outlines the specific actions stakeholders should undertake to ensure GESI-responsive WEFE Nexus integration (see Table 1).

- The importance of integrated resource management for sustainable development.
- The key benefits of adopting a GESI-responsive WEFE Nexus approach include ensuring inclusivity and equity in natural resource management.

Part II: Applying the WEFE Nexus Approach

This section provides practical guidance for local governments, municipal staff, and practitioners on applying WEFE principles in planning, budgeting, and policy formulation.

The readers will develop an in-depth understanding of:

- The 17 Sutras – guiding elements for implementing the WEFE Nexus at local and watershed levels.
- Step-by-step guidance on synergies, trade-offs, rights, governance, and stakeholder coordination.
- Case-based examples from the Rangun Watershed and insights from IWMI-led trainings to demonstrate real-world application.
- Integration of Gender Equality and Social Inclusion (GESI) principles across all stages of planning and implementation.

Part III: Practical Tools, Checklists, and Annexes

This section provides hands-on tools and frameworks to support implementation, monitoring, and learning.

You will find:

- Checklists for WEFE Nexus governance and GESI integration at local levels.
- Logical Framework (Logframe) templates for planning and tracking progress.
- Monitoring, Evaluation, Accountability, and Learning (MEAL) tools for evidence-based decision-making.

Table 1. 17 Sutras for GESI-Responsive WEFE Nexus Integration

Sutra	Names	Actions
1	<i>One Dozen Resources</i>	Understand and recognize the interconnectedness of natural and human resources using the different Sutras.
2	<i>Synergy and Trade-offs</i>	Assess the benefits and harms (trade-offs) to one aspect when performing activities in another.
3	<i>Recognition, Representation, and Redistribution</i>	Use the three R's—Recognition, Representation, and Redistribution—to ensure equity and inclusion in WEFE resources.
4	<i>Attitudes, Policies/Laws, Culture, and Behaviour</i>	Apply all quadrants, all levels matrix to assess attitudes, policies, culture, and behaviour for sustainable resource governance
5	<i>SDG 5 – Gender Equality and Empowerment of Women and Girls</i>	Take SDG 5 as the core principle for managing the twelve interconnected aspects.
6	<i>Unified Solutions</i>	Apply six integrated solutions—technical, nature-based, governance, demand-based, market-based, and social-justice-based approaches—to implement the WEFE Nexus.
7	<i>SDG 7-Alternative Energy</i>	Affordable and clean energy as a guiding principle to expand access to renewable, reliable, and inclusive energy solutions at the local level.
8	<i>Avoid the Eight Tendencies of Non-Nexus Inherent Practices</i>	Identify and abandon eight isolated, sectoral, or exclusionary tendencies; adopt a culture of integration and collaboration in planning and implementation.
9	<i>Bundle of Rights and Responsibilities of Citizens Over Natural Resources</i>	Recognize and uphold the nine rights and responsibilities of citizens and communities over natural resources for inclusive, equitable, and accountable governance of WEFE systems.
10	<i>Ten Contributing Sectors of Climate Change Mitigation and Adaptation</i>	Strengthen coordination and collaboration across sectors to integrate climate mitigation and adaptation into WEFE planning for resilient and sustainable development
11	<i>Eleven-Step Planning Process for WEFE Nexus Integration</i>	Apply an eleven-step process—from context analysis to monitoring and evaluation—to mainstream the WEFE Nexus into local-level planning and budgeting systems.
12	<i>Twelve WEFE Nexus Governance Aspects</i>	Strengthen twelve governance dimensions
13	<i>Thirteen Cross-Sectoral Institutions</i>	Engage and harmonize the mandates of thirteen cross-sectoral institutions at federal, provincial, and local levels to promote coherence in WEFE Nexus implementation.
14	<i>Fourteen Aspects of WEFE Governance</i>	Strengthen fourteen governance aspects, including legal frameworks, institutional mechanisms, participatory processes, and financing systems for effective WEFE coordination and accountability.
15	<i>Fifteen Integrated Solutions for the WEFE Nexus</i>	Apply fifteen integrated solution pathways—covering technical, nature-based, governance, demand-based, market-based, and social-justice-based innovations—to achieve resilience and equity across the WEFE sectors.
16	<i>Sixteen Key Stakeholders of the WEFE Nexus</i>	Engage sixteen key stakeholder groups—including government, civil society, academia, private sector, women, youth, and marginalized communities—to ensure participatory and inclusive WEFE governance.
17	<i>Seventeen Sustainable Development Goals</i>	Align WEFE Nexus planning and implementation with all seventeen SDGs to promote holistic, equitable, and sustainable development at all levels.

1. Introduction

1.1 Understanding the WEFE Nexus Approach

The term "nexus," from the Latin *nectare*, means a connection or link. The WEFE Nexus gained attention after its introduction by the World Economic Forum in 2011, with many scholars like Hoff (2011), Howells et al. (2013), Ringle et al. (2013), De Laurentiis et al. (2016), Simpson and Jewitt (2019), exploring its theoretical foundation and practical applications. This approach focuses on managing water, energy, food, and environment/ecosystems holistically, emphasizing interconnections to minimize trade-offs, maximize synergies, and enhance governance. It embeds resource linkages within natural, built, and institutional systems, ensuring sustainable security, particularly for marginalized communities. The WEFE nexus approach advocates a holistic approach in managing these essential resources to promote human well-being and environmental sustainability (Simpson et al., 2023). This approach seeks to enhance resource efficiency, minimize trade-offs, and foster synergies among resources, thereby improving governance, security, and functionality across WEFE. It emphasizes a shift in focus from resources to a systems perspective that prioritizes comprehensive resource security and environmental protection (Pokharel et al., 2024). Nexus thinking is a way to develop people-focused solutions for managing interconnected resources. It helps address the needs of different stakeholders at various levels—from local to global—and across different temporal and spatial scales (FAO, 2014).

1.2. Why the GESI Responsive WEFE Nexus approach?

Traditionally, WEFE Nexus thinking has focused on optimizing resource efficiency, often overlooking the social, economic, and political factors that shape access to, utilization of, and management of these resources. By neglecting these dimensions, the existing power dynamics within society—which determine who benefits from and controls WEFE resources—are ignored, leading to unequal and unfair resource distribution.

A GESI-responsive WEFE Nexus approach emphasizes the importance of addressing social equity and inclusion in resource management. By integrating GESI principles, this approach ensures that women, Dalits, and other marginalized groups are recognized not only as beneficiaries of WEFE resources but also as active participants in their management. Moreover, the approach values the knowledge, capacities, and contributions of women and marginalized communities, promotes their participation in decision-making processes, and works to correct systemic inequalities.

Ultimately, a GESI-responsive WEFE Nexus fosters fair, inclusive, and sustainable resource management—contributing to greater social justice, poverty reduction, and environmental sustainability.

1.3. Why is the WEFE Nexus important for Nepal?

Nepal is endowed with abundant water, energy, farmland, and forest resources; however, persistent poverty and inequality remain significant challenges. Millions of people still lack access to clean water, nutritious food, and reliable energy, while climate change continues to threaten the country's resource security (Buchy et al., 2022). Nepal's commitment to SDGs (2, 6, 7, 8, and 12)—including food security, clean water, energy access, economic growth, and emissions reduction—aligns well with the WEFE nexus (Pokhrel et al., 2024).

The WEFE Nexus approach offers Nepal a holistic framework for sustainable resource management by recognizing the interdependence of water, energy, food, and environment, thereby enabling more effective resource utilization. It enhances climate resilience, supports global commitments like the SDGs (see Box 1) and climate action goals, and strengthens environmental governance (Jalonen et al., 2022). Additionally, it fosters cross-sector collaboration among the government, the private sector, and local communities to reduce poverty, promote equity in resource access and decision-making, and empower those without a voice in managing WEFE resources. By adopting this approach, Nepal can maximize its natural resource potential while ensuring long-term sustainability and resilience (Pokharel et al., 2024).

Box 1. Sustainable Development Goals

1. Eliminate poverty
2. Erase hunger
3. Establish good health and well-being
4. Provide quality education
5. Enforce gender equality
6. Improve clean water and sanitation
7. Grow affordable and clean energy
8. Create decent work and economic growth
9. Increase industry, innovation, and infrastructure
10. Reduce inequality
11. Mobilize sustainable cities and communities
12. Influence responsible consumption and production
13. Organize climate action
14. Develop life below water
15. Advance life on land
16. Guarantee peace, justice, and strong institutions
17. Build partnerships for the Goals

1.4. Existing WEFE Nexus governance in Nepal

Nepal's policies also acknowledge integrated approaches. However, their implementation remains weak. The governance systems of the institutions working around the WEFE nexus are fragmented, with various sectoral policies and institutions operating in silos, often leading to inefficiencies and resource conflicts (Khadka et al., 2023). While multiple ministries and agencies oversee water, energy, agriculture, and environmental conservation, there is limited coordination and integrated planning among them (Buchy et al., 2022). The federal governance structure, introduced in 2015, has further complicated WEFE management by creating overlapping responsibilities between federal, provincial, and local governments. However, recent efforts, such as the promotion of multi-stakeholder platforms and river basin management approaches, signal a gradual shift toward a more holistic approach. Strengthening institutional collaboration, aligning policies, and enhancing cross-sectoral data sharing remain critical to ensuring sustainable and climate-resilient WEFE governance in Nepal (Pokharel et al., 2024).

2. Major elements of the WEFE Nexus approach

2.1 Nepalized concept of 12 *Ja* and 17 *Sutra*

The terms "12 *Ja*" and "17 *Sutra*" are Nepalized concepts that simplify and expand on the WEFE nexus, making it more accessible to local communities and practitioners involved in planning. The content has been tailored to fit the local context and to meet the participant's training needs.

The 12 *Ja* represent culturally and ecologically significant aspects of natural resource management in Nepal. The number 12, signifying a dozen, holds exceptional, symbolic, and cultural value in the vernacular Nepali context. Commonly used in everyday expressions and practices, a dozen represents completeness, familiarity, and functional grouping in Nepali society. This symbolic resonance of 12 enhances its relevance in the context of natural resource management. Additionally, the Nepali alphabet *Ja* was deliberately chosen because it begins with the words *Jal* (water), *Jungle* (forest), and *Jamin* (land)—the three foundational elements of Nepal's natural environment and rural livelihoods. Together, the number 12 and the letter *Ja* create a meaningful and memorable framework for discussing integrated resource management.

The 17 *Sutra* refer to 17 key elements that align with the SDGs and are crucial for incorporating into development planning, including at the municipal level. During workshops, these 17 elements related to the 12 *Ja* were identified to deepen the understanding of the WEFE nexus in Nepal. The numbers and terms were selected for their ease of recall and for their role as "*Sutras*"—concise formulas for training and advocacy, especially in a GESI responsive context. The core principle behind the sutras is the recognition of interconnected and interdependent relationships among the 12 *Ja*, as well as associated sectors, actors, and issues. These issues encompass resource access, rights, gender, social inclusion, synergies, trade-offs, and their applications. The goal is to address SDGs, climate change adaptation and mitigation, and disaster risk reduction and management (DRR/M) through actionable strategies.

The *sutras* are listed in Table 1. *Sutras* 5 and 13, which focus on GESI, and *Sutra* 14, which addresses Nexus governance, are further elaborated in Annex 1, which provides a checklist.

Sutra One: One dozen resources

Action: Understand and recognize the interconnectedness of natural and human resources using the different Sutras

Sutra 1 serves as the foundational resource, linking all 16 remaining elements. The concept of 12 *Ja* represents the most critical natural and human resources integral to the WEFE Nexus. The number "12," representing a dozen, was chosen for its simplicity and cultural familiarity in the Nepali context, making it easy to remember (see Figure 1). This concept encapsulates the significance of 12 key resources: 10 related to natural resources, and the remaining 2 focus on the essential aspects of human livelihood—gender equality and social justice. Together, the 12 *Ja* provide a simplified yet comprehensive representation of the WEFE Nexus, emphasizing the interconnectedness of natural and human resources to support sustainable development and equitable outcomes.



Figure 1. The 12 *Jas*

Sutra 1-12 represents 12 resources that are significant to the mainstream in any elements related to the other 16 components of the WEFE Nexus approach outlined below. This *Sutra* provides clues to understanding the interconnections among the 12 types of resources. It examines how one aspect relates to another, specifically in terms of synergy and trade-offs described in *Sutra* 2.

Sutra Two: Synergy and Trade-offs

Action: Assess the benefits and harms (trade-offs) to one aspect when performing activities in another

Two aspects of the WEFE Nexus are (i) synergies and (ii) trade-offs. WEFE Nexus interventions aim to minimize negative impacts (trade-off) and maximize benefits (synergies), ensuring an integrated and balanced approach (Nepal et al., 2021). Reducing disputes (e.g., competition for water between agriculture and hydropower) and maximizing synergies (e.g., renewable energy improving agricultural productivity) can support local livelihoods and other opportunities. At the same time, it ensures the integrity and sustainability of ecosystems, safeguarding biodiversity and natural capital (Pokharel et al., 2024).

Sutra Three: Recognition, Representation, and Redistribution

Action: Use the three R's: Recognition, Representation, and Redistribution—to ensure equity and inclusion in the management of WEFE resources.

The three R's are fundamental principles for achieving GESI in the WEFE Nexus approach. They emphasize the need for fair identification, inclusive participation, and equitable sharing of benefits among all stakeholders. GESI analysis helps identify entry points to foster equitable and sustainable access to natural resources for diverse groups, particularly for marginalized or underrepresented groups (Jalonen et al., 2022).

The social equity framework proposed by Fraser (1998, 2006, 2010) reinforces these principles through three interconnected pillars—Recognition, Representation, and Redistribution—bound by the overarching principle of participatory parity: the ability of all members of society to interact with one another as equals. This framework is particularly beneficial for addressing GESI challenges within WEFE Nexus interventions.

- Recognition refers to the right of all individuals and groups affected by resource governance decisions to be acknowledged as legitimate and dignified stakeholders. It includes valuing their knowledge, priorities, and lived experiences in decision-making processes.
- Representation ensures that all groups, especially women, Indigenous peoples, and marginalized communities, have the right to participate equally and influence policies, plans, and governance structures that affect their lives.
- Redistribution emphasizes fair and just access to resources, opportunities, and benefits, ensuring that outcomes from WEFE-related interventions reduce existing inequalities and promote social justice.

Together, these three pillars promote inclusive governance and participatory parity, enabling all actors—regardless of gender, caste, class, or ethnicity—to actively contribute to and benefit from the sustainable management of water, energy, food, and environmental resources.

Sutra Four: Attitudes (Niyat), Policies/laws (Niyam), Culture (Sanskaar), and Behavior (Byabahaar)

Action: Apply All Quadrants and All Levels (AQAL) matrix attitudes, policies, culture, and behavior for holistic and sustainable resource governance

Effective governance of natural resources requires balanced attention to four key dimensions: attitude (*niyat*), policies/laws (*niyam*), culture (*sanskaar*), and behavior (*byabahaar*). As outlined in Wilber's (2005) Integral Theory—AQAL framework—these elements represent the interconnected layers of human and institutional systems that shape how resources are managed.

Policies and institutions (*niyam*) form the structural framework for governance, while attitudes, culture, and behaviors influence how those policies are implemented in practice. Together, they define the social, political, and institutional dimensions of the WEFE Nexus.

Applying this matrix, illustrated in Table 2, encourages leaders and practitioners to:

- Cultivate positive attitudes and commitments (*niyat*) toward sustainable and equitable resource management.

- Develop and enforce inclusive and coherent policies (niyam) that align across sectors.
- Promote shared cultural values (sanskaar) that respect nature and collective well-being.
- Foster responsible behaviors (byabahaar) that reflect ethical use and stewardship of resources

Table 2. Implementing policies, laws, and behaviors in the WEFE sector

	Subjective /Interior	Objective/Exterior
Self	Intentions (Niyat) Desire Attitude Ways of thinking Commitment Emotions Thoughts	Behavior (Byabahaar) Biology Brain Genetics Physical body Neurology Spirituality
Collective	Culture (Sanskar) Shared values Social norms Myths Family Relationship Community	Systems (Niyam) Organizations Policies, laws, procedures Resources Technology Economy Politics Production and consumption

Source: (Wilber, 2005)

By integrating these four dimensions, local governments and stakeholders can create a balanced, resilient governance system that links human values, institutional frameworks, and social norms to the sustainable management of WEFE resources.

Sutra Five: Sustainable Development Goal (SDG) Goal 5- Gender Equality and Empowerment of Women and Girls

Action: Take SDG 5 — Gender Equality and Empowerment of Women and Girls —as the core principle for managing the 12 interconnected aspects

Gender equality is central to the success of the WEFE Nexus approach. Achieving SDG 5 requires recognizing and addressing the barriers that limit women’s and marginalized groups’ participation in planning, decision-making, and benefit-sharing. Integrating gender equality into WEFE planning ensures that all individuals—regardless of gender, caste, ethnicity, or socio-economic background—can equally access and benefit from natural resources.

Local governments should:

- Incorporate gender-responsive policies and practices in all stages of planning, budgeting, and implementation.
- Promote women’s leadership and capacity building in resource management institutions.
- Ensure gender-disaggregated data and monitoring mechanisms to assess progress.
- Strengthen community awareness and institutional commitment to inclusive and equitable governance.

By mainstreaming GESI principles across WEFE initiatives, municipalities and wards can create an enabling environment that supports social justice, equity, and sustainable development for all. For the integration of GESI into the WEFE Nexus planning process, the element of GESI is also emphasized in *Sutras* 3, 6, 12, and 13, as well as in an extended checklist in Annex 2.

Sutra Six: Unified solutions

Action: Apply six integrated solutions — technical, nature-based, governance, demand-based, market-based, and social justice-based approaches to implement the WEFE Nexus approach effectively.

A comprehensive multidimensional approach is required across policy, planning, and implementation to implement a sustainable and inclusive WEFE nexus approach. This is further elaborated in another section in Part Two on the unified solutions-related checklist. The primary elements include the following:

- i) **Technical solutions:** Uses engineering and technologies to tackle societal and environmental challenges, e.g., assistive technologies and sustainable infrastructure.
- ii) **Nature-based solutions:** Restore and protect ecosystems- such as forests, springs, wetlands, and watersheds to ensure resilience and ecological balance.
- iii) **Governance solutions:** Strengthen policies, institutions, and multi-stakeholder platforms to promote transparency and collaboration.
- iv) **Demand-based solutions:** education & empowerment: Build awareness and empower communities through inclusive education and capacity development.
- v) **Market-based solutions:** Foster partnerships with the private sector and promote fair trade and investment in sustainable enterprises.
- vi) **Social justice-based solutions considerations:** Ensures justice, inclusivity in decision-making and knowledge co-creation, equitable benefits, and fair representation in policies and planning. Ensure inclusivity, equity, and fairness in decision-making, benefit-sharing, and knowledge co-creation.

By integrating these six fronts of action, local governments can develop holistic, inclusive, and climate-resilient programs that maximize synergies across the WEFE sectors while minimizing trade-offs and inequities. This is further elaborated in another section of Part Two on the unified solutions-related checklist.

Sutra Seven: Alternative energy SDG 7

Action: Take SDG 7 – Affordable and Clean Energy as a guiding principle to expand access to renewable, reliable, and inclusive energy solutions at the local level.

Energy is a critical driver within the WEFE Nexus, influencing water supply, agricultural productivity, and ecosystem health. Achieving SDG 7 requires municipalities to promote sustainable, low-carbon, and inclusive energy systems that improve livelihoods while protecting natural resources.

Local governments can take action by:

- Expanding energy access in underserved areas through off-grid and decentralized systems such as solar home systems, micro-hydropower, and community biogas plants.
- Promoting renewable energy initiatives like bio-briquettes, bio-pellets, and solar irrigation to reduce dependency on fossil fuels and firewood.
- Encouraging energy efficiency through improved irrigation pumps, LED lighting, and energy-smart buildings.
- Empowering women and marginalized entrepreneurs to lead local clean energy enterprises.
- Fostering partnerships among local governments, private sector actors, and financial institutions to mobilize investments in renewable energy.
- By embedding clean energy initiatives into municipal plans and budgets, local governments can strengthen climate resilience, reduce emissions, and contribute to inclusive economic growth in line with national and global sustainability commitments.

Sutra Eight: Avoid the eight tendencies of non-nexus inherent practices

Action: Identify and abandon eight isolated, sectoral, or exclusionary tendencies, and instead adopt a culture of integration and collaboration in planning and implementation.

The WEFE nexus approach emphasizes interlinkages among water, energy, food, and environment. However, resource management practices in Nepal have often been fragmented, leading to inefficiencies, duplication, and missed

opportunities. This Sutra highlights the need to replace non-nexus tendencies with integrated, inclusive, and coordinated solutions. Eight common non-nexus tendencies to avoid include:

- i) **Isolated planning and management:** Non-nexus resource management often involves compartmentalized planning without considering interconnections between sectors. For example, energy projects might neglect their impacts on water availability or food security.
- ii) **Single-sector policies and strategies:** Policies focused exclusively on one sector fail to address the interdependencies of resources. For instance, water policies that do not account for agricultural or energy needs can lead to inefficiencies and resource conflicts.
- iii) **Sectoral silos:** Institutions and stakeholders working in isolation without coordination and collaboration exacerbate fragmented resource management, leading to duplication of efforts and missed opportunities for achieving development outcomes.
- iv) **Absence of measurement synergy and trade-offs:** Ignoring trade-offs and co-benefits between water, energy, food, and environment results in imbalanced decisions. Effective nexus management requires tools to evaluate synergies and quantify impacts across sectors.
- v) **Lack of stakeholder integration:** Non-nexus approaches often exclude key stakeholders, such as local communities, the private sector, or marginalized groups, from decision-making processes. This can lead to inequitable and unsustainable outcomes.
- vi) **Unsustainable practices of the biosphere, society, and environment:** Resource extraction or utilization without considering environmental limits or social well-being undermines long-term sustainability. For example, over-extraction of groundwater for irrigation can lead to environmental degradation.
- vii) **Short-term solutions:** Prioritizing immediate benefits over long-term sustainability fails to address systemic challenges. For instance, subsidizing energy-intensive water pumps for agriculture may offer short-term relief but exacerbate groundwater depletion.
- viii) **Absence of GESI-responsive multi-front solutions:** Resource management that does not incorporate GESI fails to ensure equity and inclusivity.

Sutra Nine: Bundle of rights and responsibilities of citizens over natural resources

Action: Recognize and uphold the nine rights and responsibilities of citizens and communities over natural resources to ensure inclusive, equitable, and accountable governance of WEFE systems.

Effective resource management depends on a clear understanding of the rights and responsibilities of citizens, communities, and institutions. In the WEFE Nexus context, ensuring that all actors—particularly local communities, women, Indigenous peoples, and marginalized groups—can access, manage, and benefit from natural resources is vital for long-term sustainability. Local governments should facilitate and protect the following nine rights within their legal and institutional frameworks:

- i) **Right to access:** Physical access to WEFE resources for daily needs and livelihoods.
- ii) **Right for withdrawal:** Right to permit designated community members to extract resources sustainably
- iii) **Management rights:** The authority to plan and oversee the protection and use of WEFE resources, enabling inclusive decision-making that considers the needs of the poor, women, Dalits, and marginalized groups of people.
- iv) **Use rights:** This right enables local communities to determine how WEFE resources are utilized and marketed, potentially prioritizing the needs of target groups. The freedom to utilize and market WEFE resources while ensuring equitable benefits.
- v) **Exclusion/ inclusion rights:** This right supports legitimate user groups based on inclusive criteria. The rights also ensure marginalized groups are included in the membership and decision-making positions.
- vi) **Duration of rights:** The right ensures security of the implementation of the WEFE resources management plan and its contribution to poverty reduction and sustainable development.
- vii) **Compensation rights:** This right provides a mechanism for fair procedures and compensation in case of resource repossession, safeguarding the interests of vulnerable groups.

- viii) **Alienation rights:** It refers to the authority to sell, mortgage, or transfer ownership of resources.
- ix) **Extinguishability rights:** This pertains to the ability to maintain or terminate rights over WEFE resources.

In Nepal, most of these rights—except alienation and extinguishability—are partly devolved to communities under various natural resource governance frameworks. By reinforcing community-based management, participatory planning, and accountability mechanisms, local governments can strengthen stewardship, reduce conflicts, and promote shared responsibility for the sustainable use of WEFE resources.

Sutra Ten: The contributing sectors of Climate Change Mitigation and Adaptation

Action: Strengthen coordination and collaboration across ten key sectors to integrate climate change mitigation and adaptation into WEFE planning for resilient and sustainable development

Work in coordination across the ten sectors (see Figure 2) outlined in climate change policies to mitigate climate change from carbon sequestration, carbon emission reduction, preparedness, and Disaster Risk Management. In 2021, Nepal formulated the National Adaptation Plan (NAP 2021-2050) for a 30-year period. The plan outlines several priority areas to ensure sustainable development and climate resilience. These include agriculture and food security to support sustainable livelihoods and food availability; forests, biodiversity, and watershed conservation to protect vital ecosystems and enhance natural resource management. Water resources and energy are prioritized to ensure sustainable access and production, while the development of both rural and urban settlements aims to improve resilience across regions (GoN, 2021).



Figure 2. Ten key sectors outlined in climate change policy 2019

Source: GoN (2019)

Other key areas include strengthening industry, transport, and physical infrastructure to support sustainable growth, as well as promoting tourism and preserving Nepal’s natural and cultural heritage. Health, drinking water, and sanitation initiatives are designed to protect public health, while disaster risk reduction and management efforts aim to mitigate climate-related impacts (ibid).

The NAP also highlights enabling actions to foster an environment conducive to adaptation, along with clear institutional arrangements for effective implementation. Financial requirements are outlined and supported by a robust framework for monitoring, review, and reporting. Gender equality and social inclusion are integrated across all programs, ensuring strengthened livelihoods and governance for all communities, especially vulnerable and marginalized groups (ibid).

Before NAP, 12 sectors were identified by the climate change adaptation policy (MoFE, 2019). These sectors encompass eight key thematic sectors and four cross-cutting areas. Thematic sectors include forests and biodiversity, water resources, energy, and agriculture and food, ensuring ecological balance and resource sustainability.

Water is central to climate adaptation, mitigation, and disaster risk management, serving as a lifeline for people and ecosystems alike. Promoting four key types of water storage—dams, groundwater recharge, small water-harvesting ponds, and wetlands—ensures resilience against climate-induced extremes such as floods, droughts, and erratic rainfall. Integrating these measures within a WEFE nexus approach enhances resource efficiency and sustainability. Equally vital is the role of green water—soil moisture—which supports forest ecosystems, sustains wildlife, and underpins dryland agriculture, on which many of the poorest communities depend for their livelihoods. By linking water more deliberately across sectors and systems, we can build adaptive capacities, reduce emissions through nature-based solutions, and better manage climate-related risks.

In addition, urban and rural settlements, industry, transport and infrastructure, and tourism, as well as natural and cultural heritage, support economic growth and resilient communities. Health, water supply, sanitation, and hygiene safeguard public well-being. Cross-cutting areas such as GESI, livelihoods, and good governance promote inclusivity, while climate financing ensures resource mobilization. Awareness-raising and capacity-building empower communities, and research, technology, and extension services drive innovation toward sustainable solutions (ibid).

Sutra Eleven: Eleven types of diverse stakeholders

Action: Identify and engage eleven types of diverse stakeholders through a multi-stakeholder platform to ensure collaboration, shared accountability, and inclusive governance of WEFE resources

The WEFE Nexus approach thrives on collective action and cross-sector collaboration. Effective planning, implementation, and monitoring require the meaningful involvement of actors at all levels—federal, provincial, local, institutional, and community. Recognizing and engaging diverse stakeholders, including targeted beneficiaries (refer to Sutra 13 for the list of beneficiaries), ensures that different perspectives, capacities, and knowledge systems contribute to sustainable outcomes. Stakeholders' demands and needs shall drive the policies and initiatives for sustainable resource use. The eleven key categories of stakeholders include:

- i) **The Federal Government** is responsible for policy formulation, resource allocation, and regulatory frameworks for managing water, energy, food, and environment at the national level.
- ii) **Provincial Governments** play a bridging role between federal policies and local implementation. Focuses on provincial-level projects, coordination, and enforcement of federal directives. Strategic planning and budgeting of projects and programs related to water, energy, food, and environment at the provincial level is the role of the provincial government.
- iii) **Local Governments** engage directly with communities to implement WEFE projects, address local needs, and ensure sustainable resource management at the grassroots level. The regulatory function for managing water, energy, food, and environment at the local level is the responsibility of local government.

There are functions, functionaries, and funds allocated to manage WEFE resources by all levels of government. They need to be operated in the principle of coordination, cooperation, and co-existence, taking exclusive and concurrent rights into account, which are outlined in Annexes 5, 6, 7, 8, and 9 of the Constitution of Nepal (GoN, 2015). In case of any dispute or conflict among the governments, the principle of subsidiarity should be applied.

- iv) **Non-Governmental Organizations provide** advocacy, capacity building, and technical support in WEFE sectors. These organizations play a critical role in addressing gaps in government efforts.
- v) **Community Groups and Federations represent** local forest user groups, water user associations, farmers' cooperatives, energy user groups, and other community-led organizations. They are vital for designing and implementing WEFE projects at the ground level.

- vi) **Professional Organizations include** engineers, environmental scientists, and planners who provide expertise in designing, monitoring, and evaluating WEFE-related projects.
- vii) **Research and academic actors** conduct applied and educational research and develop innovative approaches for WEFE integration. Universities and research institutes also train professionals to address challenges in these sectors.
- viii) **Banks and micro-finance institutions** provide financial services, including loans, grants, and investments, to support infrastructure and programs in the WEFE sectors.
- ix) **Donors and INGOs** offer funding and technical assistance for projects that address water security, renewable energy, sustainable agriculture, and environment conservation.
- x) **Private sector enterprises** are involved in manufacturing, distribution, and innovation in technology and infrastructure for WEFE sectors, such as irrigation systems, renewable energy, and agri-business.
- xi) **Service providers and consultants:** Delivering operational, advisory, and maintenance services in WEFE infrastructure, e.g., water supply, energy systems, and agricultural projects.

The interconnected roles of these stakeholders in the WEFE Nexus implementation are as follows:

- **Water:** Managed by federal, provincial, and local governments, alongside community groups and private sector water service providers.
- **Energy:** Private and public sector energy providers, banks, and donors contribute to renewable energy solutions, particularly in rural areas.
- **Food:** Community groups, cooperatives, and professional organizations ensure sustainable agricultural practices.
- **Environment:** NGOs and academia lead research and advocacy efforts to integrate environment conservation into water, energy, and food policies.

Sutra Twelve: Essential twelve elements for WEFE Nexus log frame

Action: Use the Log Frame (Logical Framework) as a planning and monitoring tool to integrate twelve essential elements of the WEFE Nexus for systematic, results-based, and inclusive resource governance.

The Logical Framework (log frame) is a vital planning tool that brings clarity, structure, and strategic focus to project design and implementation. By clearly defining objectives, expected results, activities, indicators, and assumptions, the log frame helps ensure that all components of a project are logically connected and aligned with the desired impact. It facilitates better communication among stakeholders, enhances accountability, and provides a solid foundation for monitoring and evaluation. Applying it through a WEFE Nexus lens ensures that planning processes are integrated, participatory, and GESI-responsive. It enables municipalities to translate complex nexus principles into practical, actionable, and trackable plans.

Remember at least 12 key elements to craft a workable WEFE Nexus log frame as a planning tool. The 12 elements are illustrated briefly in Table 3 below:

Table 3. WEFE Nexus Log frame

Component	Description	Example / Key Elements
1. Goal (Impact)	Define the Long-term change aimed through WEFE integration	Sustainable and integrated WEFE governance ensures climate resilience, GESI inclusion, and ecosystem health
2. Purpose (Outcome)	Specify the immediate results expected from the intervention	Strengthened cross-sectoral governance and inclusive decision-making for sustainable WEFE management
3. Outputs	Identify tangible results contributing to the outcome	<ul style="list-style-type: none"> - Multi-stakeholder platform guidelines - Policies for cross-sector collaboration - Learning and sharing mechanisms - Resource leverage tools - Capacity-building programs - Technical WEFE integration solutions
4. Activities	Outline the action required to produce outputs	<ul style="list-style-type: none"> - Capacity-building - Knowledge-sharing - Technology deployment
5. Inputs (Resources)	Allocate human, financial, and technical resources	<ul style="list-style-type: none"> - Financial resources - Human expertise - Technical infrastructure
6. GESI Mainstreaming	Ensure gender equality and inclusion across all processes	Ensuring inclusive participation in WEFE decision-making
7. Climate Resilience & Disaster Risk Management	Enhancing the ability to withstand climate impacts	Building resilience to climate change and related risks
8. Policy & Institutional Coordination	Promote coherence across governance levels and sectors	Strengthening multi-sectoral, multi-level, and multi-actor governance for aligned WEFE policies
9. Local Investment for Financial Sustainability	Securing long-term local financing	Mobilizing community and domestic investment for sustained WEFE governance
10. Innovation & Technologies	Encourage new approaches and tools for integration	Adopting innovative partnerships and technologies to improve resource efficiency
11. Community Engagement	Empower local actors through participation and capacity development	Strengthening local knowledge and encouraging active community participation
12. Monitoring, Evaluation & Knowledge Sharing	Track progress, capture lessons, and inform adaptive management.	Systems for tracking progress, capturing lessons, and adapting management strategies

By following this framework, planners and decision-makers can ensure that their interventions are logical, transparent, and outcome-oriented. It also supports evidence-based decision-making, facilitates coordination among multiple actors, and promotes accountability across institutions.

Applying the Log Frame within the WEFE Nexus enables municipalities to develop comprehensive watershed and resource management plans that are both technically sound and socially inclusive, aligning with national policies and global development goals.

Sutra Thirteen: Thirteen underprivileged and marginalized groups

Action: Identify and prioritize the needs of thirteen underprivileged and marginalized groups to ensure that WEFE Nexus planning and decision-making processes are inclusive, equitable, and socially just

Nepal's Constitution and related laws promote positive discrimination to empower historically marginalized and excluded populations. This Sutra emphasizes that social justice and equality must be embedded across all stages of WEFE governance—from policy formulation to local implementation. While making decisions and plans, consider the needs of the 13 targeted groups listed in Box 2 below. This requires alignment with Sutra 5 on gender equality and is further elaborated in Part Two of the GESI-related checklist. The thirteen marginalized and underprivileged groups that require focused attention include:

Box 2. Marginalized and underprivileged groups in Nepal

1. Caste-based marginalized communities
2. Economically disadvantaged and people living in poverty
3. Gender minorities
4. Persons with disabilities
5. Sexual minorities (LGBTIQ+)
6. Geographically remote and hard-to-reach populations
7. Senior citizens
8. Children and youth
9. Helpless person
10. Landless and bonded laborers
11. Poor single women
12. Stateless individuals
13. Unemployed youth

Local governments should ensure that these groups are recognized, represented, and benefit equitably from WEFE-related interventions. This can be achieved through:

- Participatory planning processes that ensure the voices of marginalized groups are heard.
- Targeted capacity-building programs to strengthen leadership and participation.
- Equitable benefit-sharing mechanisms that reduce inequalities in access to resources.
- GESI-responsive budgeting to allocate resources for inclusion initiatives.

By integrating the concerns of these thirteen groups, municipalities can make WEFE Nexus planning truly people-centered, reinforcing Nepal's constitutional commitment to social justice, equality, and inclusive governance.

Sutra Fourteen: Fourteen specific aspects of WEFE Nexus governance

Action: Strengthen WEFE Nexus governance by integrating fourteen key aspects that promote coordination, transparency, accountability, and inclusivity across all levels of government and sectors.

Fragmented institutions, overlapping responsibilities, and weak coordination often hinder resource efficiency and equity. This *Sutra* provides a framework for municipalities and stakeholders to establish robust, cooperative governance systems that bridge these gaps. While planning and implementing, focus on the following 14 elements as prerequisites for WEFE Nexus governance.

This is further highlighted below:

- i) Discuss opportunities and challenges related to 12 *Ja*.
- ii) While drafting plans, use the seventeen Sutras as a checklist or guiding framework in all plans and discussions.
- iii) Consider the needs of the 13 marginalized groups in every planning and policy process.
- iv) Establish a multi-stakeholder platform for discussion and joint decision-making.
- v) Activate the existing inter-agency coordination committees for collaboration.
- vi) Identify resource management capacity gaps related to 12 *Ja* and prepare and implement action plans (who, where, by whom, by when, and budget) for capacity building.
- vii) Ensure that funding, staffing, and mandates are adequate for assigned functions
- viii) Develop implementation and monitoring plans for reflection and continuous learning
- ix) Harmonize policies and legal frameworks to eliminate contradictions and overlaps.
- x) Establish mechanisms for conflict prevention and resolution among stakeholders
- xi) Utilize digital platforms and means to exchange information and knowledge
- xii) Sensitize leadership about the added value of the WEFE Nexus approach and encourage them to be engaged in addressing risks and challenges encountered during work
- xiii) Allocate a typical budget and program among inter-municipalities and multi-stakeholders to pilot and scale up the WEFE Nexus approach
- xiv) Promoting Public-Private-Community Partnerships (PPCP) to share responsibilities, resources, and results.

When local governments and institutions apply these fourteen aspects, they foster systemic integration across sectors, scales, and actors. This results in improved efficiency, reduced duplication, and enhanced accountability—creating a governance environment that supports inclusive, climate-resilient, and sustainable development.

Sutra Fifteen: SDG 15—Life on land

Action: Take SDG 15 - Life on Land as the guiding principle for promoting ecosystem integrity, biodiversity conservation, and sustainable land management within the WEFE Nexus approach

Remember SDG 15 — Life on land, including human well-being — as the core mantra for the purpose of managing interconnected WEFE resources. Achieving SDG 15 at the local level in Nepal requires a combination of approaches, including a community-driven, ecosystem-based approach that balances conservation and sustainable use of terrestrial resources.

Local governments can advance this goal by:

- Empowering local communities and Indigenous people to promote sustainable forest and land management by supporting local community groups to protect, manage, utilize forest and land resources, conserve biodiversity, and enhance the livelihoods of people dependent on the resources. This can be done by developing a local, specific legislative framework, aligning with federal and provincial laws, bylaws, and operational guidelines. Restoration of degraded lands through natural regeneration, afforestation, and reforestation programs, particularly using native species, will be crucial to combat desertification and land degradation.
- Protecting critical habitats and biodiversity hotspots can be achieved by enforcing local-level conservation policies and legal frameworks and integrating indigenous and traditional knowledge into forest and land resource management practices.

- Supporting environment-based livelihoods, such as agroforestry, sustainable NTFPs, and eco-tourism by providing economic incentives for conservation.
- Addressing human-wildlife conflicts by implementing locally tailored wildlife management and utilization strategies and supporting alternative livelihoods.

It is important to remember that empowering marginalized groups, as mentioned in *Sutra 13*, including women and indigenous communities, ensures inclusivity and equity in conservation efforts. Awareness campaigns, capacity-building programs, and partnerships with NGOs, academic institutions, and the private sectors can further enhance the effectiveness of local initiatives, contributing to the broader goals of biodiversity conservation, sustainable development, and climate resilience. Integrating SDG 15 into WEFE planning strengthens ecosystem resilience, safeguards biodiversity, and ensures that human activities contribute positively to the balance of natural systems. By doing so, municipalities can advance conservation objectives and sustainable development outcomes simultaneously—building a foundation for climate-resilient, inclusive, and thriving communities.

Sutra Sixteen: Peace, Justice, and Strong Institutions

Action: Take SDG 16 – Peace, Justice, and Strong Institutions as the foundation for building trust, accountability, and social harmony in WEFE Nexus governance.

Take SDG 16—Guarantee peace, justice, and strong institutions — as the most important mantra for managing the interconnected WEFE resources. Remember that these natural resources can only be sustainably managed and used if there are strong institutions at all levels across sectors. These institutions and their relationship are social capital.

Achieving SDG 16 at the local level, therefore, requires building inclusive, accountable, and participatory governance systems that foster trust and social cohesion. Strong institutions serve as the foundation for delivering essential services, including those in the WEFE sectors as defined in the form of 12 *Ja*, by ensuring equitable access and sustainable resource management. Local governments can prioritize transparency and accountability through participatory planning and decision-making processes that involve all stakeholders described in *Sutra 11*, including marginalized groups, women, and youth, as indicated in *Sutra 13*.

Strengthening social capital involves empowering civil society groups and market actors by ensuring constitutional and legal tenure rights, as mentioned in *Sutra 9* to manage resources and resolve conflicts collaboratively. Municipalities can enhance local judicial mechanisms, such as mediation centers, to ensure access to justice and the peaceful resolution of disputes. Additionally, investing in capacity-building programs for municipal officials, community leaders, civil society, and market actors —including entrepreneurs and business communities —can improve institutional effectiveness.

Promoting anti-corruption practices, enforcing the rule of law, and leveraging digital governance tools can further strengthen institutional credibility. Municipalities, in collaboration with their constituencies and local networks, can create resilient, just, and peaceful communities that enable sustainable development across all sectors by fostering cooperation between local governments, civil society, market actors, and development partners.

Sutra Seventeen: SDG number 17 – Partnership for WEFE Nexus to SDGs and its reporting

Action: Establish a Monitoring, Evaluation, Accountability, and Learning (MEAL) and Reporting system to document WEFE Nexus initiatives' contribution to achieving the SDGs through evidence-based and inclusive approaches

Establish a robust partnership among actors and sectors and craft a MEAL to document how the WEFE nexus approach contributes to the 17 SDGs, specifically SDG goals 2, 5, 6, 7, 10, 13, 15, and 17. Mobilize professionals and trained human resources to conduct research and document the direct contributions of the interconnections between water, forests, land, and bio-energy towards the above-mentioned SDG goals. Local governments, in collaboration with provincial and federal agencies, can:

- Develop a robust MEAL and reporting system that tracks progress across sectors, particularly through the application of the WEFE nexus approach. Ensure that WEFE-related indicators are included in annual plans and budgets.
- Track progress on interconnections between water, energy, agriculture, forests, land, climate, and environment and their direct contributions to SDGs, specifically SDG 2 (no hunger), 5 (gender equality), 6 (clean water and sanitation), 7 (affordable and clean energy), 10 (reduced inequalities), 13 (climate action), 15 (life on land), and 17 partnerships.
- Mobilize trained professionals and researchers for conducting multidisciplinary studies that highlight how the integrated management of WEFE resources supports poverty reduction, gender equality, resource equity, and climate resilience.
- Local governments, in collaboration with academic institutions, NGOs, and private sector stakeholders, can foster partnerships to finance and operationalize research projects.
- Documenting successful case studies and best practices can provide actionable insights and promote scaling-up efforts.
- Establishing data-sharing platforms, fostering innovation hubs, and engaging local communities in participatory monitoring can further strengthen the system.

A strong reporting and learning system not only demonstrates accountability but also helps identify synergies, gaps, and opportunities for continuous improvement. By aligning WEFE planning and implementation with SDG monitoring, local governments can showcase their transformative role in achieving sustainable, inclusive, and resilient development in Nepal.


3. Conclusion

The GESI-Responsive WEFE Nexus Manual represents a significant step toward promoting integrated, inclusive, and evidence-based resource governance in Nepal. It translates complex nexus concepts into practical approaches that local governments, practitioners, and communities can adopt to address the interlinked challenges of natural resource management, gender equality, and climate resilience. This manual is expected to serve as a practical guide for policymakers, planners, and practitioners, underscoring the need for the systematic integration of the WEFE Nexus into Nepal's watershed management and development planning.

The manual emphasizes integrating the WEFE Nexus approach into Nepal's natural resource management and governance to ensure resource sustainability, resilience, and inclusivity. This manual stresses collaboration, synergies, and coordination across and between sectors, actors, and levels of government to enhance water, energy, food, and environmental security. As Nepal navigates increasing environmental and socio-economic challenges, WEFE-informed policies and governance mechanisms offer a transformative pathway toward equitable resource distribution, climate resilience, and sustainable development.

This resource manual has outlined the Nepalized concept of 12 *Ja* and 17 *Sutra*, providing a contextual framework for integrated planning. Through this concept, this manual has localized global principles, linking them with the SDGs and Nepal's development priorities. Each *Sutra* highlights a core action area—from promoting synergy and inclusivity to strengthening governance, ensuring social justice, and fostering collaboration among multiple stakeholders. Together, these *Sutras* offer a holistic roadmap for implementing the WEFE approach at the watershed and local levels.

Notably, the manual places GESI at the center of the nexus framework, recognizing that equitable participation and benefit-sharing are vital for sustainable outcomes. The inclusion of practical tools, checklists, and logframe templates equips users with actionable guidance for planning, monitoring, and reporting progress aligned with the SDGs (Refer to the annex for the practical checklist for operationalizing WEFE governance and mainstreaming GESI). By integrating these elements, Nepal can strengthen its local planning process, establish sound governance systems, enhance climate



resilience, and promote sustainable resource use, making the WEF Nexus a transformative tool for sustainable resource management in achieving national development goals and SDG commitments.

Moving forward, the practical application of the WEF Nexus approach will depend on continued capacity building, policy harmonization, and multi-stakeholder partnerships. Strengthening coordination across government levels, fostering knowledge exchange, and mobilizing local investments will be essential to scale up the approach beyond individual watersheds.

Annex I. Checklist of WEFE Nexus governance and GESI

The annex provides a detailed checklist for Sutra 5 on GESI and Sutra 14 on WEFE Nexus governance, supporting the establishment of a robust governance framework and the effective integration of GESI principles into the WEFE Nexus planning process. These checklists serve as practical tools for ensuring inclusive, equitable, and sustainable resource management. Additionally, the importance of GESI considerations is reinforced in Sutra 3, 6, 12, and 13, highlighting its cross-cutting role in achieving holistic and participatory WEFE governance.

Annex 1: WEFE Nexus governance

The concept of nexus governance emphasizes a holistic and integrated approach to managing interlinked systems and resources, ensuring sustainable outcomes across sectors. Grounded in research and evidence-based policymaking, nexus governance prioritizes cross-sectoral policies and integrated planning to align and harmonize contradictory legal frameworks while recognizing the critical need for a nexus approach to address pressing global challenges such as climate change and achieve the SDGs. It leverages data integration across sectors, inter-institutional coordination, and robust regulatory frameworks to ensure coherence and efficiency.

Central to this approach is stakeholder engagement, reducing transaction costs, establishing a functional multi-stakeholder platform for open dialogue, and capacity building of all the stakeholders, including government, marginalized groups in the community, Indigenous people, *Dalit*, and people with disability. This approach suggests using shared resources and infrastructure to foster collaboration and ensure cost-effectiveness. Financial mechanisms such as a typical budget for common programs underpin the approach, enabling the development of pilot projects for the translation of the WEFE nexus approach into practice, encouraging innovation, and facilitating the replication and scaling up of successful initiatives. By integrating technology, adopting a multi-solution approach, and implementing a robust MEAL and reporting framework, nexus governance not only addresses immediate challenges but also builds public awareness of the importance of cross-sectoral collaboration for the long-term sustainability of resource management. The short description of the 14 key elements of WEFE nexus governance is illustrated below and briefly pointed out in Box 3.

Box 3. WEFE Nexus Governance

1. Evidence-based policymaking
2. Cross-sectoral and inter-municipality policies and plans of government and non-government sectors
3. Integrated unified planning for water, energy, food, and environment
4. Policy alignment and harmonization across sectors and levels
5. Unified legal frameworks across WEFE sectors
6. Recognition of existing programs as entry points (e.g., for climate action and SDGs)
7. Integrating data in a GESI-responsive WEFE Nexus approach
8. Inter-institutional coordination desk/focal point
9. Operationalize Multi-Stakeholders Platform
10. Promoting capacity-building programs in the WEFE Nexus approach
11. Promoting public awareness campaigns on the WEFE nexus
12. Promoting a culture of shared office space, budget, and infrastructure in the WEFE Nexus
13. Promoting financial mechanisms for cross-sectoral initiatives in the WEFE Nexus
14. Designing and implementing pilot projects and dedicated budget and staff positions to promote the WEFE Nexus

i) Evidence-based policymaking

Evidence-based policymaking in the WEFE nexus governance ensures that decisions are grounded in robust, interdisciplinary data and research to address the interdependence between water, energy, food, and environment. It integrates tools such as data collection, predictive modeling, and scenario planning to assess trade-offs and synergies across sectors. By combining scientific research with local stakeholders' inputs, including traditional knowledge, the policy-making process ensures that policies are equitable, contextually relevant, and adaptive to emerging challenges. Continuous monitoring and evaluation, coupled with transparent decision-making processes, enable policy adjustments for improved resilience and sustainability. This approach fosters alignment of sectoral policies, minimizes conflicts, and enhances co-benefits, contributing to sustainable resource management and progress toward SDGs.

ii) Cross-sectoral and inter-municipality policies

Develop policies that explicitly recognize and incorporate the interdependencies of the WEFE sectors and inter-municipality coordination. This includes creating frameworks that facilitate collaboration among responsible sectors for water, energy, agriculture, and environmental management.

iii) Integrated Unified Planning

Implement integrated, unified resource management plans that account for the needs and impacts of all sectors involved. For example, water management policies should align with energy production and agricultural practices to avoid conflicts and inefficiencies.

iv) Policy alignment and harmonization across sectors

Establish a harmonized policy and legal framework for regulations that does not contradict sector-specific policies and laws, and instead promotes harmony and sustainable practices across industries. For example, incentives for renewable energy that also account for economic water use, such as drip irrigation in agricultural practices that enhance soil and water conservation.

v) Unified regulatory legal frameworks across WEFE sectors

Work towards aligning and harmonizing policies and regulations by unifying confusing and contradictory policy and legal frameworks. This needs to be done across different sectors and administrative levels. This ensures coherence and reduces conflicts or duplications in policy implementation. An integrative approach is essential to harmonize and unify regulatory and legal frameworks across the WEFE sectors. Key strategies include aligning policies through cross-sectoral dialogues, coherence analysis, and integrated frameworks; fostering institutional collaboration via inter-agency committees and shared governance platforms such as multi-stakeholder platforms; and leveraging data-driven decisions through unified database systems and impact assessments. Capacity building for policymakers and developing technical guidelines ensures better implementation without duplication, while inclusive stakeholder engagement incorporates diverse perspectives and resolves conflicts. Flexible and adaptive legal instruments, tested through pilot programs, address evolving challenges. Financial and non-financial incentives (appreciation) encourage compliance, while robust enforcement mechanisms ensure accountability. National, sub-national, and local level cooperation and cross-border collaboration enhance best practices, and regular monitoring and evaluation refine frameworks over time.

vi) Recognition of existing programs as entry points (e.g., for climate action and SDGs)

Rather than designing entirely new programs, recognizing and leveraging existing initiatives that require multi-sector collaboration provides a practical entry point for implementing the WEFE nexus approach. Programs addressing climate action and advancing the SDGs can offer ideal platforms to demonstrate the added value of nexus thinking, given their inherent interdependencies across water, energy, food, and environment. These initiatives often face challenges such as competing resource demands, fragmented policies, and sectoral silos, which the nexus approach is uniquely positioned to address. By integrating nexus principles into these programs, policymakers and municipality leadership can showcase practical solutions that optimize resource use, minimize trade-offs, and enhance synergies across sectors. This pragmatic strategy not only validates the efficacy of the nexus approach but also builds institutional capacity and stakeholder confidence for scaling it up in other contexts.

vii) Integrating data in a GESI-responsive WEFE Nexus approach

Integrating data involves establishing robust data systems that enable cross-sectoral information sharing. This requires the collection, integration, and analysis of diverse datasets, such as water accessibility by gender, energy consumption patterns, food security indicators, and ecosystem health parameters, with a focus on disaggregated data for marginalized groups. These integrated systems help illuminate the interdependencies within the nexus, such as how energy policies impact water resources or how food production affects ecosystems, while also highlighting inequalities and vulnerabilities. By fostering collaboration among stakeholders, including policymakers, community representatives, and researchers, these systems enable informed decision-making and equitable resource management. Such integration ensures that the specific needs of women, marginalized communities, and other vulnerable groups are prioritized, promoting inclusive and sustainable outcomes across the WEFE nexus.

viii) Inter-institutional coordination for the promotion of the WEFE Nexus approach

Promoting inter-institutional coordination is critical to effectively addressing the interconnected challenges of the WEFE nexus. Collaboration among governmental, non-governmental, market actors, and community-based organizations can be enhanced by establishing inter-agency committees or task forces dedicated to nexus-related issues. These platforms can facilitate regular dialogue, align policy objectives, and foster the sharing of expertise and resources across sectors. By creating a structured mechanism for joint planning and decision-making, inter-institutional coordination helps identify synergies, avoid duplication of effort, and address trade-offs holistically. Additionally, inclusive participation from diverse stakeholders ensures that solutions are equitable and reflect the needs of all, particularly marginalized groups, while also promoting accountability and transparency in nexus governance. This approach not only strengthens institutional relationships but also builds a cohesive strategy for sustainable and integrated resource management.

ix) Operationalize Multi-Stakeholders Platform

Establishing and operationalizing multi-stakeholder platforms is vital for fostering meaningful engagement in planning, implementation, monitoring, and joint learning within the WEFE nexus approach. These platforms provide a collaborative space for diverse actors to share insights, resources, and responsibilities. Effective engagement begins with inclusive planning processes that recognize the needs and perspectives of all stakeholders, particularly marginalized and vulnerable groups, ensuring their voices are represented in decision-making. Transparent and participatory mechanisms, such as workshops, consultations, and stakeholder forums, can be utilized to co-design strategies and implementation frameworks. During the implementation phase, collaborative monitoring and evaluation systems allow stakeholders to track progress, identify challenges, and adaptively manage interventions. Facilitating joint learning through knowledge exchange and capacity-building activities further strengthens partnerships and builds trust among stakeholders. By promoting inclusivity, transparency, and shared accountability, multi-stakeholder platforms ensure that nexus solutions are equitable, efficient, and sustainable.

Best practices of these platforms include ensuring diverse representation by involving all relevant stakeholders, 11 are identified in Sutra 11-12 to capture varied perspectives and expertise and operationalize a targeted approach to reach marginalized communities. Establishing clear governance structures —defined roles, responsibilities, and decision-making processes —fosters accountability and efficient collaboration. Regularly convening meetings, workshops, and dialogue sessions promotes consistent communication and trust-building among stakeholders. The use of participatory tools, such as joint problem-solving exercises, scenario planning, and collaborative monitoring frameworks, enhances collective ownership of outcomes. Additionally, leveraging technology for data sharing and virtual collaboration broadens access and reduces barriers to participation. A commitment to capacity-building and knowledge exchange ensures that all stakeholders are empowered to contribute effectively. By prioritizing these best practices, multi-stakeholder platforms can drive innovative, equitable, and sustainable solutions to nexus-related challenges.

x) Promoting capacity-building programs in the WEFE Nexus approach

Promoting capacity-building programs is essential to enhancing the ability of institutions to analyze and manage interconnected challenges effectively. These programs should prioritize training staff in integrated resource management, equipping them with the skills to understand and address the complex interdependencies between water, energy,

food, and environment. Specialized workshops, on-the-job training, and e-learning modules can be tailored to develop expertise in cross-sectoral data analysis, policy integration, and sustainable resource allocation. Facilitating knowledge exchange through partnerships with academic institutions, international organizations, and technical experts can provide access to innovative tools and methodologies. Incorporating hands-on learning, such as case studies, simulations, and participatory approaches, ensures that trainees gain practical insights into managing nexus-related issues. Additionally, fostering peer-to-peer learning networks, mentorship programs, and communities of practice (COP) allows institutions to share lessons learned and best practices. By investing in capacity-building programs, institutions can enhance their decision-making processes, drive integrated solutions, and promote sustainable outcomes across the WEFE nexus.

xi) Promoting public awareness campaigns on the WEFE nexus

It requires a strategic approach to effectively engage diverse audiences. Educational campaigns should focus on demonstrating the interconnectedness of these sectors and their collective role in achieving sustainability and resilience. By utilizing multimedia platforms, interactive workshops, and community-based initiatives, these campaigns can simplify complex concepts, making them accessible and relatable to the general public. Targeted messaging for policymakers can highlight the economic, environmental, and social benefits of adopting a nexus approach, fostering informed decision-making. Additionally, integrating the WEFE nexus into school and university curricula, local events, and media stories can build a culture of sustainability and encourage long-term behavioral change, thereby generating broad public support for sustainable policies and practices.

xii) Promoting a culture of shared resources and infrastructure in the WEFE Nexus

Fostering a culture of shared resources and infrastructure among sectors is vital for advancing the approach. This involves creating mechanisms for collaborative resource use, such as shared water storage systems, multipurpose renewable energy facilities, and integrated land-use plans that support food production and environmental services simultaneously. Encouraging partnerships between sectors can optimize resource allocation, reduce costs, and minimize environmental impacts. For example, treated wastewater can be reused for irrigation, while agricultural and forest residues can be repurposed for bioenergy production. Establishing platforms for joint planning and investment ensures that infrastructure development aligns with nexus objectives, promoting synergies and avoiding sectoral conflicts. Policy incentives, such as subsidies for shared facilities or tax benefits for cross-sectoral collaboration, can further encourage adoption. Additionally, fostering a mindset of mutual benefit and shared responsibility through capacity building, stakeholder engagement, and public awareness campaigns is essential. By embracing shared resources and infrastructure, sectors can work together to achieve sustainable, efficient, and equitable outcomes in managing interconnected systems.

xiii) Promoting financial mechanisms for cross-sectoral initiatives in the WEFE Nexus

Establishing robust financial mechanisms is crucial for supporting cross-sectoral initiatives. This can be achieved by designing innovative funding solutions, such as subsidies, grants, or public-private partnerships (PPPs), that incentivize integrated projects. For instance, governments and international agencies can provide grants to pilot programs that demonstrate synergies between sectors, such as using renewable energy for water pumping in agriculture or implementing agroforestry practices that enhance ecosystem services. Subsidies can be directed towards technologies or practices that address multiple nexus dimensions, such as solar-powered irrigation systems or waste-to-energy projects. Public-private partnerships can play a pivotal role by leveraging private sector investments while ensuring public benefits, fostering collaboration, and sharing risks. Establishing dedicated cross-sectoral funding pools and green financing instruments, such as blended finance or impact bonds, can further attract diverse stakeholders. Additionally, creating transparent and inclusive mechanisms for financial allocation ensures that investments align with nexus goals, prioritize marginalized communities, and promote sustainable development. By adopting these financial strategies, the WEFE nexus can drive impactful and integrated solutions.

xiv) Designing and implementing pilot projects in the WEFE Nexus

It requires a systematic, inclusive approach that identifies specific local challenges and opportunities across the water, energy, food, and environment sectors to ensure the project addresses real-world issues. Engage stakeholders

—including community members, policymakers, and technical experts—to co-create solutions that integrate nexus principles into project design across any nexus configuration, such as water-energy, food-water, environment-food, and so on. Develop clear objectives, timelines, and measurable outcomes to guide the project and assess its impact. Implement the pilot in a defined geographic or community context, leveraging innovative technologies and practices to optimize resource efficiency and sustainability. Regularly monitor and evaluate progress, capturing best practices and lessons learned to refine the approach. By effectively showcasing tangible benefits—such as improved resource management, cost savings, and enhanced resilience—these pilot projects can serve as scalable models, building momentum for broader adoption of the nexus framework.

Annex 2: GESI in WEFE Nexus

Mainstreaming GESI into the WEFE nexus is essential for achieving equitable and sustainable outcomes. Table 4 presents a matrix that illustrates how to integrate GESI into the WEFE nexus using a scale of responsiveness. The matrix outlines actionable steps, expected outcomes, and indicators for each thematic area of GESI responsiveness. It offers a structured approach to ensure that interventions are not only sustainable but also equitable, just, and inclusive.

Table 4. GESI Responsive Dimension in the WEFE Nexus

GESI responsiveness dimensions	Description	Key actions	Expected outcomes	Indicators
Highlighting inequalities and recognition of social realities	Identifying and addressing barriers faced by women and marginalized groups in WEFE systems.	<ul style="list-style-type: none"> - Conduct participatory gender and social analysis. - Collect disaggregated data (gender, caste, ethnicity, etc.). - Identify power dynamics and access gaps. 	<ul style="list-style-type: none"> - Better understanding of intersectional inequalities. - Evidence-based planning and interventions. 	<ul style="list-style-type: none"> - % of WEFE sector projects informed by disaggregated data. - Stakeholder feedback on the inclusion of diverse voices.
Promoting justice, fairness, and sustainability	Embedding equity in access to resources and opportunities within the WEFE nexus.	<ul style="list-style-type: none"> - Develop GESI-sensitive policies and frameworks. - Strengthen social safeguards to protect marginalized groups. - Promote inclusive planning mechanisms. 	<ul style="list-style-type: none"> - Fair access to water, energy, food, and ecosystem services. - Reduced resource conflicts. 	<ul style="list-style-type: none"> - Number of inclusive policies adopted. - % of stakeholders reporting increased fairness in access.
Integrating GESI throughout the process	Ensuring GESI integration at all stages of WEFE planning, implementation, monitoring, and evaluation.	<ul style="list-style-type: none"> - Incorporate GESI indicators in monitoring frameworks. - Provide GESI training to implementing stakeholders. - Facilitate GESI audits. 	<ul style="list-style-type: none"> - Systemic integration of GESI in WEFE governance. - Increased accountability for GESI-sensitive actions. 	<ul style="list-style-type: none"> - % of WEFE initiatives with GESI-inclusive monitoring. - Frequency of GESI audits conducted.

GESI responsiveness dimensions	Description	Key actions	Expected outcomes	Indicators
Enhancement of leadership capacity and support at all levels	Building the capacities of women and marginalized groups to participate in and lead WEFE initiatives.	<ul style="list-style-type: none"> - Implement leadership development programs. - Provide mentorship and networking opportunities. - Establish quotas for marginalized representation. 	<ul style="list-style-type: none"> - Improved capacity for decision-making among underrepresented groups. - Stronger leadership by women and excluded groups. 	<ul style="list-style-type: none"> - % increase in women/marginalized leaders in WEFE projects. - Number of capacity-building programs conducted.
Representation of women and marginalized communities	Ensuring meaningful participation of all groups in decision-making processes.	<ul style="list-style-type: none"> - Facilitate inclusive stakeholder consultations. - Use gender-sensitive facilitation techniques. - Establish multi-stakeholder platforms. 	<ul style="list-style-type: none"> - Diverse representation in WEFE governance. - Inclusive decision-making processes at all levels. 	<ul style="list-style-type: none"> - % representation of marginalized groups in decision-making bodies. - Feedback on the inclusiveness of processes.
Equitable benefit sharing and redistribution of benefits	Guaranteeing that the benefits from WEFE interventions are equitably distributed across different groups.	<ul style="list-style-type: none"> - Use participatory benefit-sharing mechanisms. - Prioritize vulnerable communities in benefit allocation. - Monitor distribution equity. 	<ul style="list-style-type: none"> - Improved livelihoods for marginalized groups. - Reduction in disparities in resource access and benefits. 	<ul style="list-style-type: none"> - % of benefits accruing to marginalized groups. - Perceived fairness of benefit-sharing mechanisms.

Annex II. Logical Frameworks as a Tool for Monitoring, Evaluation, Accountability and Learning

The logical framework is a widely used planning, monitoring, and evaluation tool that provides a structured approach to designing, implementing, and assessing development projects. It organizes project objectives, activities, outputs, outcomes, and impacts into a logical hierarchy, establishing clear cause-and-effect relationships. Additionally, the Log frame incorporates indicators, verification methods, and assumptions to ensure measurable results and adaptability to changing circumstances.

In the context of watershed planning for municipalities, the Logframe becomes particularly valuable when applied through a GESI-responsive WEFE nexus approach. By integrating GESI considerations, the Log frame helps identify and prioritize the needs of marginalized and vulnerable groups, ensuring that interventions are equitable and inclusive. Its structured framework helps capture the interdependencies within the WEFE nexus, such as balancing water resource allocation for energy and food production while maintaining ecosystem health. The focus of the Log frame is on measurable indicators, and participatory monitoring ensures that progress towards equitable and sustainable watershed management is tracked effectively while fostering transparency and accountability in local governance. Table 5 illustrates the logical framework matrix template, outlining its main elements and structure.

Table 5. Logical Framework Matrix

Narrative Summary	Indicators	Means of Verification	Assumptions
Goal (Impact)	Broad, long-term objective to which the project contributes—examples: Sustainable watershed management ensuring GESI-responsive WEFE outcomes.	Indicators measuring overall impact. Examples: % improvement in ecosystem health, reduction in water scarcity.	Data sources prove the achievement of the goal—examples: National statistics, remote sensing data, and reports.
Purpose (Outcome)	The immediate effect or change resulting from the project’s outputs. Examples: Inclusive watershed governance established.	Indicators measuring direct outcomes. Examples: Percentage of women/marginalized groups in decision-making roles.	Sources confirming outcome achievement. Examples: Municipal records, meeting minutes, and surveys.
Outputs	Specific deliverables or results produced by project activities. Examples: Capacity-building programs, and watershed management plans.	Indicators measuring outputs. Examples: Number of training sessions held; number of GESI-responsive plans developed.	Sources confirming outputs. Examples: Training reports, and plan documents.
Activities	Specific tasks or actions to produce outputs. Examples: Conduct GESI training and develop watershed plans using WEFE principles.	Not typically included here but can include process indicators such as how the activities were carried out, e.g., people’s participation or contractors.	Documentation of activities. Examples: Activity reports, and attendance sheets.
Inputs (Resources)	Resources required to implement activities. Examples: Financial, human, and technical resources.	Not typically included here.	Records of input use. Examples: Budgets and procurement documents.

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