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Evaluating Policy Coherence in Food, Land, and Water Systems: Evidence from India



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Cover Image: ICRISAT

Authors: CEEW

Nitin Bassi (conceptualisation; methodology; analysis; report review and editing; supervision; funding acquisition)
Suparana Katyaini (methodology; data collection; analysis; original draft report; review and editing)
Kangkanika Neog (analysis; original draft report; review and editing)
Ekansha Khanduja (methodology; data collection; analysis)
Kartikey Chaturvedi (methodology; data collection; analysis)
Upasana Negi (data collection; analysis)
Saahil Parekh (conceptualisation; methodology; data collection)
Shashwat Shukla (data collection; analysis)
Poonam Thakre (data collection; analysis)

IWMI

Archisman Mitra (methodology; analysis; original draft report)
Garima Taneja (data collection; analysis; original draft report)
Suchiradipta Bhattacharjee (data collection; analysis; original draft report)
Juan Carlos Sanchez Ramirez (conceptualisation; methodology)
Marie-Charlotte Buisson (conceptualisation; methodology)
Alan Nicol (conceptualisation; methodology)
Shilp Verma (conceptualisation; methodology)
Alok Sikka (conceptualisation; methodology)
Arun Padiyar (conceptualisation)

Reviewers: Sh. Yugal Joshi (Adviser, Water & Land Resources, I&B, Communication and Drinking Water & Sanitation, NITI Aayog), Chandan Jha (CEEW), Alan Nicol (IWMI), Juan Carlos Sanchez Ramirez (IWMI)

Publication Team: Nishtha Paliwal (IWMI), Tanmoy Bhaduri (IWMI)

Design & Layout: Caps and Shells Creatives Pvt. Ltd.

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Council on Energy, Environment and Water (CEEW)

ISID Campus, 4 Vasant Kunj Institutional Area
New Delhi – 110 070, India
+91 11 4073 3300
info@ceew.in

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International Water Management Institute (IWMI)

New Delhi office
2nd floor, CG Block C, NASC Complex, DPS Marg, Pusa,
New Delhi 110 012, India
+91 11 2584 0811, 2584 0812, and 2584 3536
iwmi-delhi@cgiar.org

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List of Acronyms

ADB	Asian Development Bank
AIBP	Accelerated Irrigation Benefit Programme
AMRUT	Atal Mission for Rejuvenation and Urban Transformation
ABY	Atal Bhujal Yojana
AYUSH	Ayurveda, Yoga and Naturopathy, Unani, Siddha and Homeopathy
CAC	Central Apex Committee
CAMPA	Compensatory Afforestation Fund Management and Planning Authority
CAZRI	Central Arid Zone Research Institute
CEEW	Council on Energy, Environment and Water
CEGC	Central Employment Guarantee Council
CETP	Common Effluent Treatment Plant
CGIAR	Consultative Group for International Agricultural Research
CGWB	Central Ground Water Board
CHPMA	community horticulture production and marketing associations
CPCB	Central Pollution Control Board
CRIDA	Central Research Institute for Dryland Agriculture
CSO	Civil Society Organisations
CSS	Centrally Sponsored Schemes
CWC	Central Water Commission
DAY-NRLM	Deendayal Antyodaya Yojna – National Rural Livelihoods Mission
DIP	District Implementation Partners
DIP	District Irrigation Plans
DLC	District Level Committee
DLI	Disbursement Linked Indicators
DLIC	District Level Implementation Committee
DMC	District Mission Committee
DMEO	Development Monitoring and Evaluation Office
DoA&FW	Department of Agriculture and Farmers Welfare
DoLR	Department of Land Resources
DoWR, RD&GR	Department of Water Resources, River Development and Ganga Rejuvenation
DPC	District Planning Committee
DPC	District Programme Coordinator
DPMU	District Programme Management Unit
DPU	District Programme Unit
DQMC	District Quality Monitoring Cell

EC	Executive Committee
FLW	Food, Land and Water
FPO	Farmer Producer Organisation
GC	General Council
GDPMS	Ganga District Performance Monitoring System
GESI	Gender Equality And Social Inclusion
GIS	Geographical Information System
GoI	Government of India
GP	Gram Panchayat
GS	Gram Sabha
HRIDAY	National Heritage City Development and Augmentation Yojana
HYVP	High Yielding Varieties Programme
ICAR	Indian Council of Agricultural Research
ICT	Information Communication Technology
IFS	Integrated Farming System
IIFM	Indian Institute of Forest Management
IISWC	Indian Institute of Soil and Water Conservation
INR	Indian Rupee
IRMA	Institute of Rural Management
ISEC	Institute for Social and Economic Change
IWMP	Integrated Watershed Management Programme
KVK	Krishi Vigyan Kendra
M&E	Monitoring And Evaluation
MGNREGS	Mahatma Gandhi National Rural Employment Guarantee Scheme
MI	Micro Irrigation
MIDH	Mission for Integrated Development of Horticulture
MIS	Management Information System
MEF&CC	Ministry of Environment, Forest and Climate Change of India
MJS	Ministry of Jal Shakti
MRD	Ministry of Rural Development
MSP	Minimum Support Price
MT	Metric Tonnes
MVC	Model Village Concept
NABARD	National Bank for Agriculture and Rural Development
NCPAH	National Committee on Precision Agriculture and Horticulture
NEC	National Executive Committee
NFSM	National Food Security Mission

NGO	Non-Governmental Organisation
NGRBA	National Ganga River Basin Authority
NHM	National Horticulture Mission
NIRDPR	National Institute of Rural Development and Panchayati Raj
NITI Aayog	National Institution for Transforming India
NLA	National-Level Agencies
NLNA	National-Level Nodal Agency
NLSC	National Level Steering Committee
NMCG-NGP	National Mission for Clean Ganga–Namami Gange Programme
NMSA	National Mission on Sustainable Agriculture
NPMU	National Program Management Unit
NRAA	National Rainfed Area Authority
NREGA	National Rural Employment Guarantee Act
NRLM	National Rural Livelihood Mission
NRM	National Resource Management
NRSC	National Remote Sensing Centre
NULM	National Urban Livelihoods Mission
OFWM	On-Farm Water Management
PDS	Public Distribution System
PIA	Project Implementation Agencies
PKVY	Paramparagat Krishi Vikas Yojana
PMAY-G	Pradhan Mantri Awaas Yojana – Gramin
PMEU	Project Monitoring and Evaluation Unit
PMGSY	Pradhan Mantri Grameen Sadak Yojana
PMMSY	Pradhan Mantri Matsya Sampada Yojana
PMU	Project Monitoring Unit
PRASAD	Pilgrimage Rejuvenation and Spiritual Augmentation Drive
PRI	Panchayati Raj Institutions
PWDP	Participatory Watershed Development Programme
QCI	Quality Council of India
RBI	Reserve Bank of India
RGNGWTRI	Rajiv Gandhi National Ground Water Training and Research Institute
RKVY-PDMC	Rashtriya Krishi Vikas Yojana- Per Drop More Crop
SBM	Swachh Bharat Mission
SC	Scheduled Castes
SDG	Sustainable Development Goal
SECC	Socio-Economic Caste Census

SHG	Self-Help Group
SHM	State Horticulture Missions
SIMA	State Institutes for Agriculture Management
SIRD	State Institutes of Rural Development
SLAMC	State-Level Approval and Monitoring Committee
SLEC	State-Level Executive Committee
SLNA	State-Level Nodal Agency
SLSC	State-Level Sanction Committee
SLSC	State-Level Steering Committee
SPCB	State Pollution Control Board
SPMG	State Programme Management Groups
SPMRM	Shyama Prasad Mukherji Rurban Mission
SPMU	State Programme Management Unit
SPU	State Programme Unit
SQMC	State Quality Monitoring Cell
ST	Scheduled Tribes
TMIAMP	Tamil Nadu Irrigated Agriculture Modernisation Project
TPDS	Targeted Public Distribution System
TPGVA	Third-Party Government Verification Agency
TSG	Technical Support Group
ULB	Urban Local Bodies
UNEP	United Nations Environment Programme
UTLAMC	Union Territory Level Approval and Monitoring Committee
UTPU	Union Territory Programme Unit
VIUC	Vegetable Initiative for Urban Clusters
VO	Voluntary Organisations
WC	Watershed Committee
WCDC	Watershed Cell Cum Data Centre
WDC	Watershed Development Committee
WDC-PMKSY	Watershed Development Component - Pradhan Mantri Krishi Sinchayee Yojana
WDF	Watershed Development Fund
WUA	Water User Association
ZP	Zila Parishad

Executive Summary

The critical interlinkages among the food, land, and water (FLW) systems are complex and context-specific. There has been limited research on how policies governing one resource have deep implications for the other linked resources. Further, the process of developing policies is highly complex, and each evolves differently. In addition, policy changes are implemented in response to socio-cultural, economic, environmental, and political changes. Thus, individual policies may develop conflicting priorities and effects.

To ensure the effectiveness of national policies and strategies, it is crucial to gather context-specific

evidence on the coherence between policies governing FLW systems and address points of incoherence. Policy coherence is important to identify and strengthen synergies across economic, social, and environmental policy areas and address any trade-offs¹ between them to align domestic policy objectives with internationally agreed objectives.

The study offers key evidence-based recommendations to address the identified gaps and challenges in the selected national policies, which are essential for enhancing policy coherence.



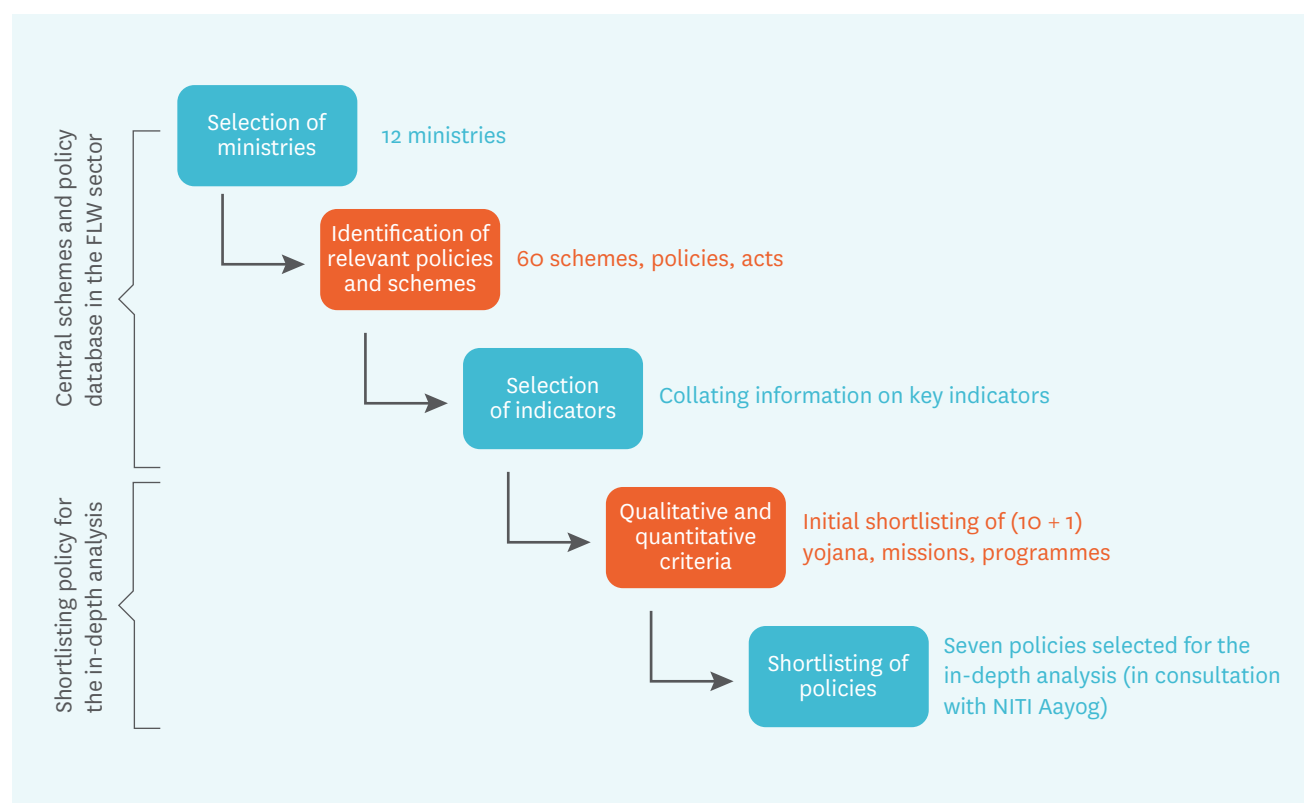
¹ An example of trade-offs is the fertiliser subsidy policy, which aims to reduce production costs and increase yields for farmers. However, it has led to the excessive use of nitrogen fertiliser, causing soil and water degradation (Ritchie 2021).

Methodology

To comprehend the policy landscape, data was collated on 60 central-level policies², spanning 12 ministries deemed relevant for FLW systems. Seven policies were shortlisted based on certain quantitative³ and qualitative⁴ criteria and in

consultation with the National Institution for Transforming India (NITI) Aayog, the apex public policy think tank of the Indian government. The selected policies are highlighted in Figure ES 1.

Figure ES 1: Seven policies were selected for an in-depth analysis from a list of 60 policies concerning 12 ministries



Source: Authors' analysis

The policies were analysed through a literature review, content analysis of the policy guidelines, and several expert consultations. As policy coherence has a layered conceptualisation, it was analysed through the prism of five categories: (i) horizontal and vertical institutional coherence⁵;

(ii) external consistencies⁶; (iii) scope for convergence⁷; (iv) flexibility and adaptability⁸; and (v) social inclusion⁹. The key findings were disseminated through a national-level consultation workshop in June 2023 to gain a precise understanding.

² In the Indian context, these are referred to as schemes, missions, and programmes that are formulated for implementation in specific thematic areas such as groundwater management, watershed development, and so on. But in this study, these are collectively referred to as policies in alignment with global conventions.

³ Five quantitative criteria were used to shortlist 10 policies: i) whether the policy had a mechanism for implementation; ii) whether it had a link with three or more CGIAR impact areas; iii) whether one of those areas was environmental health and biodiversity; iv) whether it was enacted on or before 2020; and v) its budgetary expenditure.

⁴ Four qualitative criteria were used as guiding principles for discussions with the NITI Aayog for final selection: vertical and horizontal institutional coherence (implementation requires coordination among multiple government agencies); social inclusion (social inclusion is very important for success); external consistency (policy objectives imply cross-sectoral dependency); and flexibility and adaptability (policies in domains that require adaptability to change).

⁵ This refers to coordination mechanisms between two or more government agencies and between different levels of government (center and state and state and district).

⁶ This refers to the extent to which the objectives of a particular policy are aligned with other existing government policies and broader developmental goals.

⁷ This refers to existing enabling mechanisms for leveraging resources and institutions across different government policies for implementation, and associated challenges which may act as barriers to strengthening such convergence.

⁸ This refers to a policy's ability to manage unanticipated changes that could have significant societal consequences.

⁹ This concerns how the policy is addressing the concerns and interests of vulnerable sections of society.

Key Findings

More than half of the 60 policies considered in the database were primarily concerned with the food sector, followed by policies concerning the water and land sectors, respectively. Based on a careful analysis of policy documents and discussions with stakeholders, the following were ascertained:

23%

Policies were predominantly focused on sustainable agricultural practices

13%

Focused on skill development and empowerment

15%

Focused on improved crop production

12%

Focused on extension activities

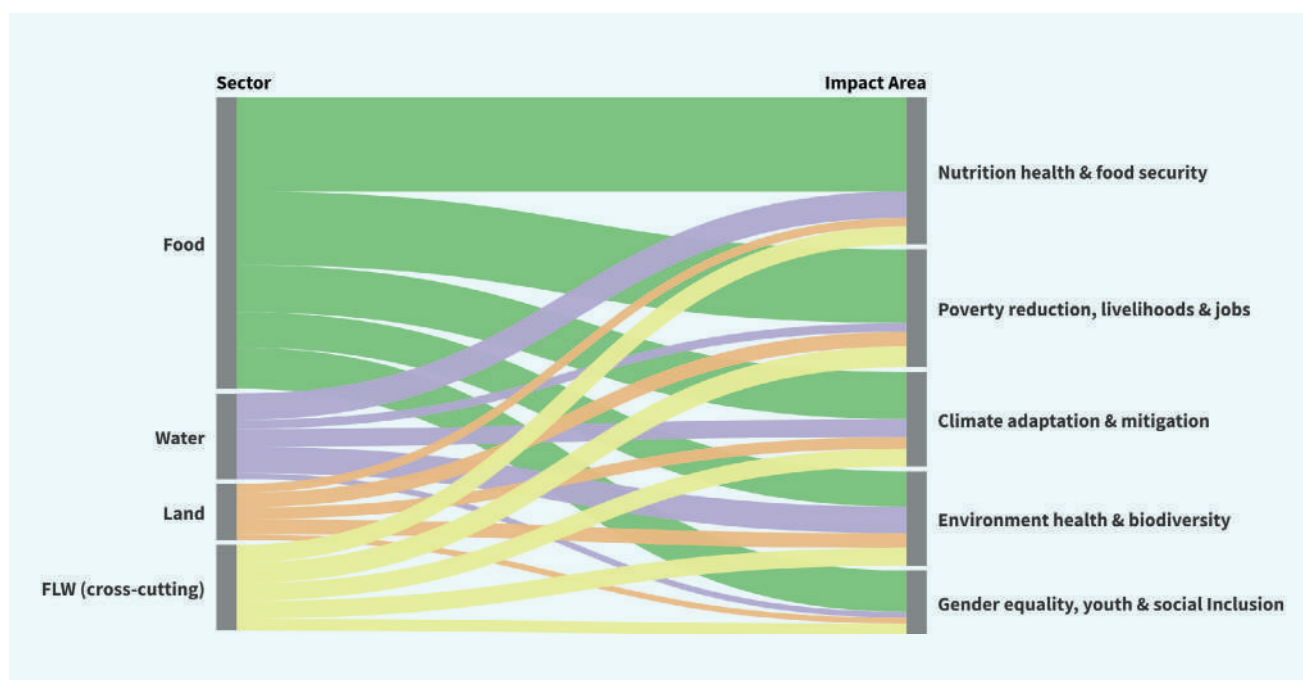
13%

Focused on investment in water infrastructure

The mapping of the policy objectives along the One CGIAR impact areas indicates that most align with the themes of ‘nutrition, health, and food security’ and ‘poverty reduction, livelihoods, and jobs’. There is also a notable focus on ‘climate adaptation and mitigation’ and ‘environmental health and biodiversity’, with nearly half of the policies aligning with these areas. While ‘gender equality, inclusion, and diversity’ received relatively lesser attention, it was significant for food policies covering child nutrition and health. Figure ES 2 explains the linkages of various policies to the One CGIAR areas.



Figure ES 2: Most FLW policies align with the areas of nutrition, health, and food security



Source: Authors' analysis

The seven policies selected for the in-depth analysis were Rashtriya Krishi Vikas Yojana – Per Drop More Crop (RKVK–PDMC)¹⁰, the Mission for Integrated Development of Horticulture (MIDH) by the Ministry of Agriculture and Farmers Welfare; the Pradhan Mantri Matsya Sampada Yojana (PMMSY)¹¹ by the Ministry of Fisheries, Animal Husbandry and Dairying; the Pradhan Mantri Krishi Sinchayee Yojana – Watershed Development Component

(WDC–PMKSY 2.0)¹²; the Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS) by the Ministry of Rural Development (MoRD); the National Mission for Clean Ganga – Namami Gange Programme (NMCG–NGP); and Atal Bhujal Yojana (ABY) by the Ministry of Jal Shakti (MoJS)¹³.

The key findings on policy coherence through the prism of five categories are discussed in Figure ES 3.

Figure ES 3: The key findings of the policy coherence analysis highlight the status of the FLW policies

Horizontal and vertical institutional coherence

- *In most cases, there was a well-established mechanism in the policy design for horizontal institutional coherence in the form of inter-ministerial and cross-sectoral coordination mechanisms. Inter-ministerial and inter-departmental coordination were relatively well-developed at the planning and implementation stages of the policies in comparison to the monitoring and evaluation and impact evaluation stages observed across all the selected policies.*
- *Inter-ministerial coordination at the impact evaluation stage was at an early stage, and it was mostly output-based rather than outcome-based. A greater focus on outcome-based approaches to policy design would help improve inter-ministerial coordination, since the outcomes are often cross-sectoral.*
- *Bottom-up vertical coordination was primarily well-developed in policies that aimed at effecting ground-level change like enhancing rural employment through engagement in resource conservation in MGNREGS; improving the water-use efficiency practices of farmers through micro-irrigation systems in RKVK–PDMC, and enabling the community-led sustainable management of groundwater in ABY.*
- *Certain mechanisms for fostering cross-sectoral coherence have been developed, such as the ‘sectoral group of secretaries’ at the national level (Taneja et al. 2023). However, since policy action takes place at the state, district, block, and village levels, similar mechanisms at each of these levels to strengthen institutional coherence could be explored.*

External consistency

- *There was an explicit recognition in the policy framework of the external consistencies between policies, especially between MGNREGS and ABY, as these require community involvement in planning and implementing activities in line with the policy objectives.*
- *A few trade-offs between policies were also recognised, which may contribute to negative impacts on each other.*
- *The experts interviewed perceived that the policies have a positive impact on the achievement of multiple SDGs. Nevertheless, there is scope for building on external consistencies and overcoming inconsistencies between the selected policies for enhancing their contribution to the SDGs.*

¹⁰ National Agricultural Development Programme – Per Drop More Crop.

¹¹ Prime Minister’s Fisheries Programme.

¹² Prime Minister’s Irrigation Programme – Watershed Development Component.

¹³ Atal Groundwater Programme.

Scope for convergence

- *An emphasis on convergence was observed in some of the selected policies built on the thematic interlinkages between FLW resources. For example, integrated farming system is a part of WDC-PMKSY 2.0.*
- *Knowledge management emerged as an important element in convergence, though it was found to be largely sectoral. The Ganga Knowledge Centre created as a part of the NMCG-NGP emerged as a best practice integrated knowledge system that can enable the convergence of efforts and resources for advancing sustainability.*
- *The thematic coverage of the different forms of policies was found to be sectoral, limiting the realisation of the full potential of the convergence of efforts and resources. In this regard, ABY and MGNREGS were identified as exceptions due to their demonstrated convergence efforts.*

Flexibility and adaptability

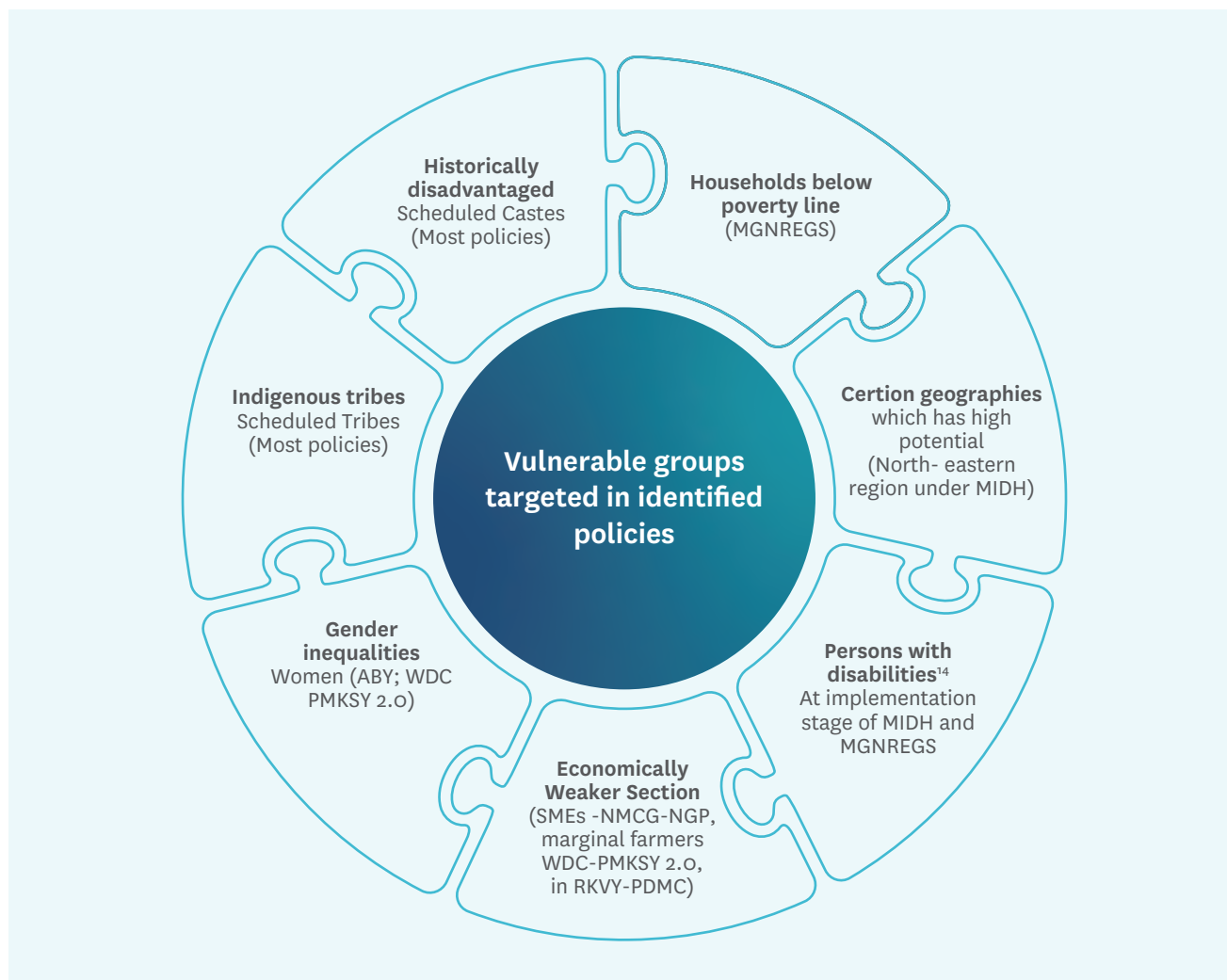
- *This dimension was at an early stage. The discussions as a part of the study helped kickstart thinking on the need for policies to be flexible and adaptable to social, economic, and other changes that take place at the ground level.*
- *For decision-making support, data-driven adaptability was found to be at a nascent phase in the policy cycle.*
- *Adaptability was largely seen at the monitoring and evaluation stage. Geographic information system (GIS)-based monitoring and evaluation in ABY and information communication and technology (ICT)-enabled portals that cover grassroot-level data in PMMSY are the best practices that promote data-driven adaptability.*

Social inclusion

- *The selected policies mostly cover a broad spectrum of vulnerable groups (Figure ES 4), thus reflecting a targeted approach to social inclusion in policy design.*
- *The inclusion is enabled through various mechanisms, the most prominent being reserving a dedicated place for vulnerable groups for engagement in the activities envisioned in the policy or setting a criteria for particular positions. An example of this would be appointing only women as chair and co-chair of watershed committees.*

Source: Authors' analysis

Figure ES 4: A wide range of vulnerable groups are targeted in the identified policies



Source: Authors' analysis



¹⁴ Source: <https://www.ungeneva.org/sites/default/files/2021-01/Disability-Inclusive-Language-Guidelines.pdf>

Key Recommendations

For strengthening policy coherence in FLW systems, the study proposes the following recommendations stemming from the key findings.

Horizontal and vertical institutional coherence

- Further strengthen horizontal and vertical institutional coherence by transitioning to an integrated focus instead of a sectoral focus in policies. This can be enabled through the joint leadership of the concerned ministries and improved coordination. Enhancing vertical institutional coordination, by considering existing best practices of bottom-up coordination between institutions, is crucial for establishing it in other policies. There is a need to explicitly recognise capacity-building on monitoring and evaluation (M&E) and impact evaluation at the state level to strengthen institutional coherence. Further, outcome-based impact evaluation needs to be undertaken in certain policies, in addition to output-based evaluations. This is intended to assess the impact of the policies and the sustainability of policy interventions. To support institutional coherence, multi-stakeholder participation in all stages of the policy cycle should be expanded.

External consistency

- Acknowledge the significant external consistencies that exist between policies. An important step in this direction would be to align different policies with national priorities and international commitments like SDGs. ‘Sustainable livelihoods, and income enhancement’ has emerged as an important national priority with crucial linkages between FLW systems. Mapping the five priority themes of One CGIAR with the policies offers key policy insights. In some cases, comprehensive assessments are crucial to determine policy impacts on these priority themes and various SDGs. Trade-offs and synergies between the policies need to be further analysed using suitable indicators that represent the interlinkages between FLW systems. There is also a need for incentives to mitigate the adverse impacts of policies with conflicting interests.

Scope for convergence

- Include convergence considerations in policy guidelines through regular revisions. To build convergence based on a common and in-depth understanding of the potential of policies, the dissemination of the guidelines to multiple

stakeholders needs to be strengthened.

Synergies between themes which reflect the interlinkages between food, land and water systems should be systematically classified. This would be beneficial in convergence at the planning stage rather than only at the implementation stage. This can be achieved at the state level to enable the convergence of efforts and resources. Integrated data management, monitoring, and impact assessment are recommended to be considered as a priority for enabling convergence. An essential step forward is publishing information on convergence in the public domain.

Flexibility and adaptability

- Pay adequate attention to enhance the flexibility and adaptability of policies. This can be achieved by developing a holistic knowledge base on socio-economic concerns and environmental changes that may affect the policies and might be affected by them in turn. Capacities should be developed at various levels to improve flexibility and adaptability. It is crucial to enable cross-learning between the members of institutionalised committees and among states by promoting best practices in policy coherence in the FLW sectors. An important starting point would be going beyond the M&E stages and enhancing flexibility and adaptability to cover the entire policy cycle.

Social inclusion

- Document the mechanisms and processes that enable social inclusion. These mechanisms as best practices would be context-specific because of the socio-cultural and economic diversity that shape the processes of social inclusion. The groups most vulnerable to the challenges cutting across the FLW sectors need to be identified at the policy planning stage. The issues of the most vulnerable should be included through direct consultation with them or by inviting experts representing their concerns.

This analysis takes a national-level perspective on the policy mechanisms designed from the perspective of policy coherence. Further research in this area necessitates investigating the interaction between state and central policies and incorporating local outlooks to evaluate policy effectiveness and impact on the ground, particularly for marginalised groups.

Introduction

This study on policy coherence in FLW systems, with evidence from India, is part of the CGIAR Initiative on National Policies and Strategies (NPS) for FLW systems' transformation. The NPS Initiative is currently underway in eight countries spanning three continents: Asia (India, Laos), Africa (Egypt, Ethiopia, Kenya, Nigeria, Rwanda), and Latin America (Colombia). India stands out due to its vast scale and diversity across various dimensions, encompassing huge variety in agro-ecological and economic conditions, as well as the diverse population and cultural aspects. A direct comparison with more homogeneous and smaller nations may not be entirely appropriate, but the Indian experience offers valuable lessons for the world after recognizing the unique challenges and opportunities presented by the rich tapestry of cultures, languages, and regional variations in the country.

The NPS Initiative aims to improve the lives of millions of people by identifying ways of building stronger policies and strategies with greater coherence and capacity. It also aims to help countries address current policy demand and future development needs by building national-level policy communities around common themes and by convening rapid response teams to respond to policy demand. The key challenge that the initiative intends to address – making FLW systems more productive, resilient, and responsive to growing demand and future shocks in a rapidly changing global context – has never been greater.

Two critical resources that drive food production systems are cultivable land and utilisable water resources (Kumar, Sivamohan, and Narayanamoorthy 2012; Kumar, Bassi, and Singh 2020). Consequently, FLW resources are intrinsically linked, such that policy actions targeting one resource can have significant implications for another (Howlett and Cashore 2014). The interlinkages embedded in the use, management, and governance of these resources in India are documented to some extent in the existing literature (Kumar, Bassi, and Sivamohan 2014; Katyaini, Mukherjee, and Barua 2021; Kholod et al. 2021; Neog and Chaturvedi 2022). However, coherence in national policies and strategies targeting these sectors have received less attention.

In reality, policies are often sectoral with different ministries and associated departments operating in silos, which makes developing a holistic policy response to a crisis challenging. This results in gaps in coordination and consistency and might result in

trade-offs wherein progress in one area leads to worse outcomes in another area (Organisation for Economic Co-operation and Development [OECD] 2015; Martinez, Blanco, and Castro-Campos 2018; Omara et al. 2019). For instance, in India, the central government procures paddy at the minimum support price (MSP). This benefits farmers by ensuring a stable and profitable return on their produce, while it allows the government to maintain its stocks of paddy, which contributes to food security. However, an unintended negative consequence of this system is rapid groundwater depletion in Punjab and Haryana due to continuous and intensive paddy production (Sharma et al. 2018; Katyaini, Barua, and Duarte 2020; Rosencranz et al. 2021). The rapid groundwater depletion also results from the provision of free electricity and water as part of these states' water and energy policies to support agriculture production (Bassi 2014; Rosencranz et al. 2021). To address such unintended detrimental impacts on the sustainability of resources and environmental degradation, it is crucial to have coherence among policies concerning FLW systems as well as broader global goals on advancing sustainable development.

According to the OECD (2015), policy coherence is an approach and tool to foster synergies across economic, social, and environmental policy areas and to identify trade-offs. This contributes to reconciling domestic policy objectives with internationally agreed ones. Therefore, policy coherence is crucial for identifying optimal policy mixes and governance arrangements when dealing

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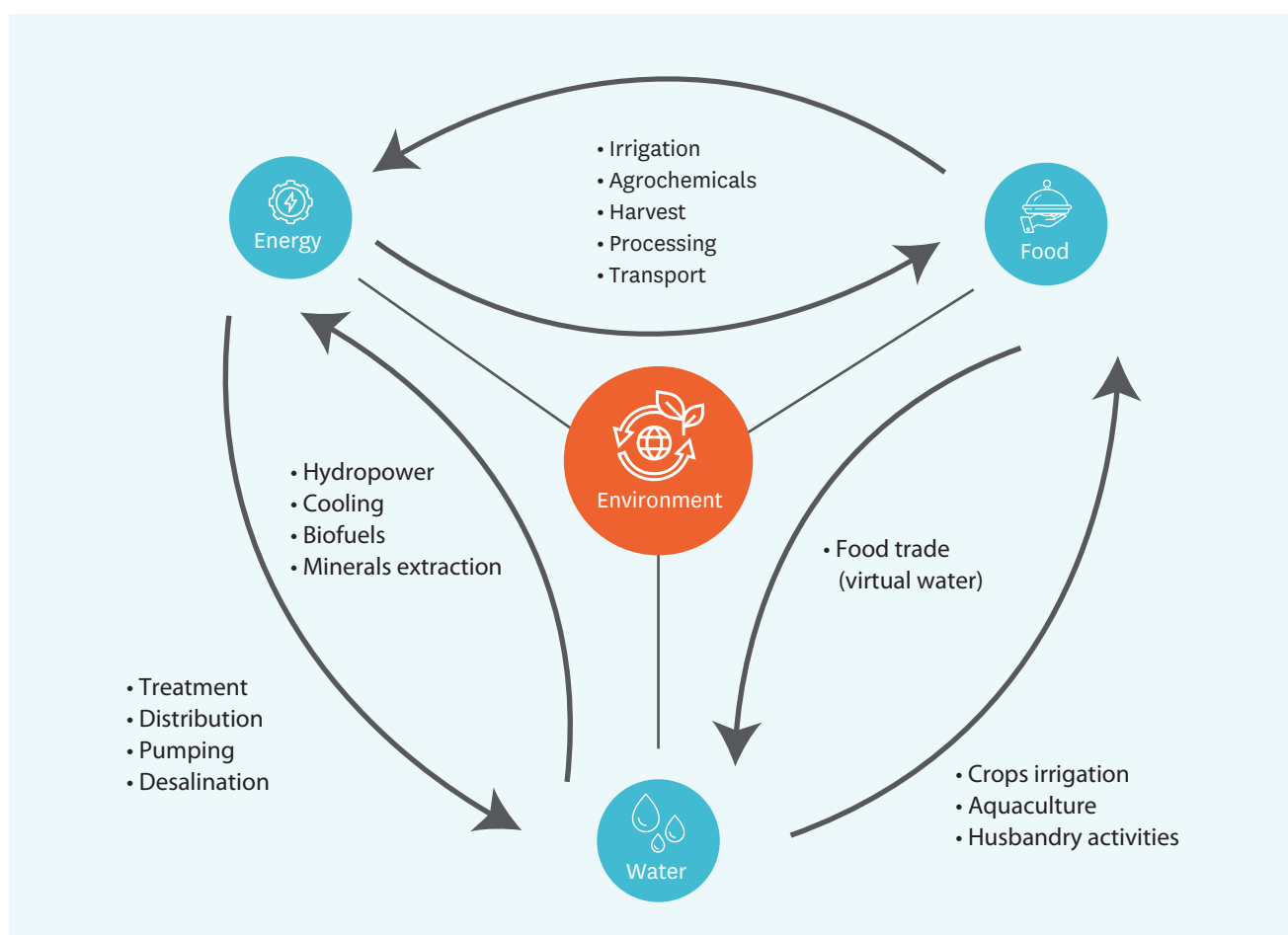
with interlinked systems (Weitz et al. 2017; Nilsson and Weitz 2019). It is important for advancing sustainable development – SDG 17 on ‘partnerships for goals’ outlines policy coherence as a major pathway to strengthen implementation and revitalise global partnerships for sustainable development. In particular, target SDG 17.14 is dedicated to ‘enhance policy coherence for sustainable development’.

Policy coherence is important not just at the planning stage but also during the implementation, M&E, and impact evaluation stages. Therefore, understanding policy interactions, the nature of policy-making processes, and assessing policy decisions are key to understanding policy coherence (Nilsson and Weitz 2019). Further, to enable coherence, various stakeholders need to be involved across several stages of the policy cycle (Righettini and Lizzi 2022). These stakeholders include the key actors involved in policy planning, implementation, M&E; the community members who are beneficiaries of the policies; and those who

are non-beneficiaries but are impacted by the policies. This makes policy flexibility an important aspect to understand in policy coherence.

There is a gap in the understanding of policy coherence in India, primarily due to the unavailability of adequate data at the sub-national level and reporting on SDG 17.14 (NITI Aayog 2021). The flagship report delves into key dimensions of policy coherence to address these gaps with a particular reference to FLW systems. In this regard, the critical interlinkages between FLW systems were understood through the resource nexus approach. This approach provides insights into the synergies and trade-offs between sectoral policies, as shown in Figure 1. It also indicates the governance challenges involved in developing cross-sectoral solutions (Bleischwitz et al. 2018). These complex interconnections between the use of natural resources, institutional structures, and social interactions are crucial to understanding the coherence between FLW systems.

Figure 1: The schematic diagram represents the interlinkages between water, food, energy, and the environment



Source: Salmoral et al. (2019), cited in Katyaini, Mukherjee, and Barua (2021)

An important aspect of policy coherence is ensuring smooth coordination among ministries and multiple levels of governance. In the Indian context, the key levels of governance are central, state, district, block, and local. To address priority issues, central policies are formulated. Issues that are of national priority range from groundwater sustainability in water-scarce states, and water-use efficiency in states where irrigated agriculture is predominant, to rural development. Water, agriculture, and land are considered state subjects¹⁵ in India. States, at times on the directive of the central government, supplements to these national policies as well as develops their own policies based on the context of the state.

At the national and sub-national level in India, the public policy sphere encompasses schemes (known as *yojana* in Hindi), missions, and programmes, in addition to larger sectoral policies. These are formulated and implemented to enable actions in specific thematic areas such as groundwater management, watershed development, and horticulture development. Larger sectoral policies include guidelines such as the National Agricultural Policy and National Water Policy. In this report, schemes, missions, and programmes are collectively referred to as ‘policies’ following international conventions as well as to allow effective communication with readers from the international research, policy, and practice spheres.

1.1. Objectives and scope

The overarching aim of the study is to generate insights on the broader policy landscape in India to guide policymakers, researchers, and stakeholders towards coherent and effective governance.

The key objectives are as follows:

- to conduct an in-depth analysis of selected national policies on FLW systems across important dimensions of policy coherence and in consultation with key stakeholders;
- to identify gaps and challenges that need to be addressed to enhance policy coherence and suggest evidence-based recommendations to improve policy coherence.

This study makes two important value additions. First, it examines the policy coherence among seven key policies in India. These are policies which have an impact on the interlinkages between the

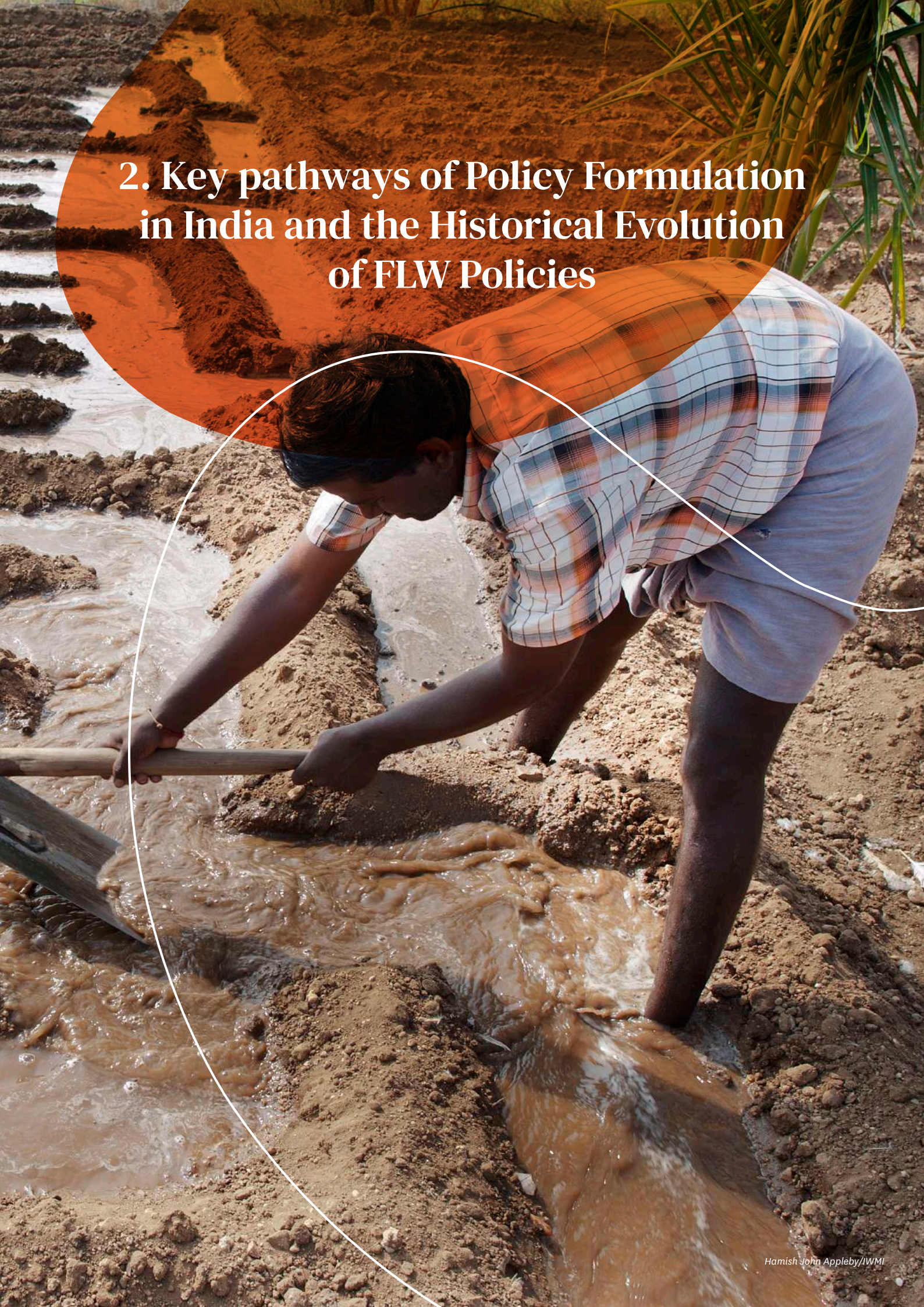
food, land and water systems, and in turn are crucial for food security, land security and water security. These policies also are important for sustainability of livelihoods. Second key contribution is evidence collected on enabling policy coherence through a consultative process.

The report is structured in six sections. Section 2 outlines the key pathways of policy formulation in India, the historical evolution of FLW policies, and a brief overview of the structure of concerned ministries and departments to gain insights into the priorities that have emerged across FLW sectors. Section 3 describes the methodological steps used to collect data from various sources and for carrying out the analysis of policy coherence. Section 4 consists of the key findings on the state of policy coherence and the weaknesses that need to be overcome to strengthen it. Section 5 presents the proposed recommendations for strengthening policy coherence, while Section 6 discusses the future scope for research that could deepen our understanding of policy coherence.



¹⁵ Under the seventh schedule of the Indian Constitution, the distribution of power and functions between the state and the central government.

2. Key pathways of Policy Formulation in India and the Historical Evolution of FLW Policies



Policy formulation is not a uniform process. It takes shape through different pathways and is highly complex. Examining the key pathways in India would offer valuable insights into the challenges and opportunities associated with policy changes. Pathways of developing new policies or revising existing policies are shaped by how major stakeholders engage in developing policy changes. The complex network of interactions between stakeholder groups that determine this process includes the government, the judiciary, research groups, civil society organisations (CSOs), political parties, interest groups, and the media. This network is illustrated in Figure 2.

Based on the literature, the authors identified some important pathways of policy change from previous experiences in India. One of them is the policy change in response to legal cases; for example, there have been many environmental public interest litigations (PILs). Desai and Muralidhar (2000) highlight numerous environmental cases in which PILs have resulted in policy change. These included the protection of the fragile Coastal Regulation Zone; the regulation of the growth of shrimp farms along the coastline; and the closure of industries that pollute soil and water, such as tanneries, chemical industries, and distillery units. However, there are also criticisms of judicial overreach, which some argue can undermine political and democratic procedures. Additionally, judicial activism may be perceived as a top-down approach with an insufficient understanding of certain issues. For example, the court-ordered closure of industries due to pollution can negatively impact the livelihood of the poor.

Second is the upscaling of state-level initiatives to the national level. For instance, the Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS) drew inspiration from the Employment Guarantee Policy of Maharashtra, which was conceived as a drought relief measure in 1972–1973 and was converted into a legal guarantee programme in 1975. Khera (2006) and Chopra (2011) provide a succinct description of the nature of the interactions between various stakeholders in developing an adequate drought relief system in Rajasthan between 2000 and 2003. The collective action was complemented by a PIL in court, addressing two aspects of food security: inadequate supply through the public distribution system (PDS) and insufficient drought relief employment. Media played a crucial role in shaping public opinion across the country by covering the

loss of lives due to starvation and the need for enhancing the policy response. These collective efforts influenced public opinion significantly. Developing a right-to-food law became a national priority. Representatives from civil society were included in an advisory council on developing the draft bills of the National Rural Employment Guarantee Act (NREGA) (2005) and the National Food Security Act (2013). This eventually led to the creation of the government policy through the legislative and executive branches of the government.



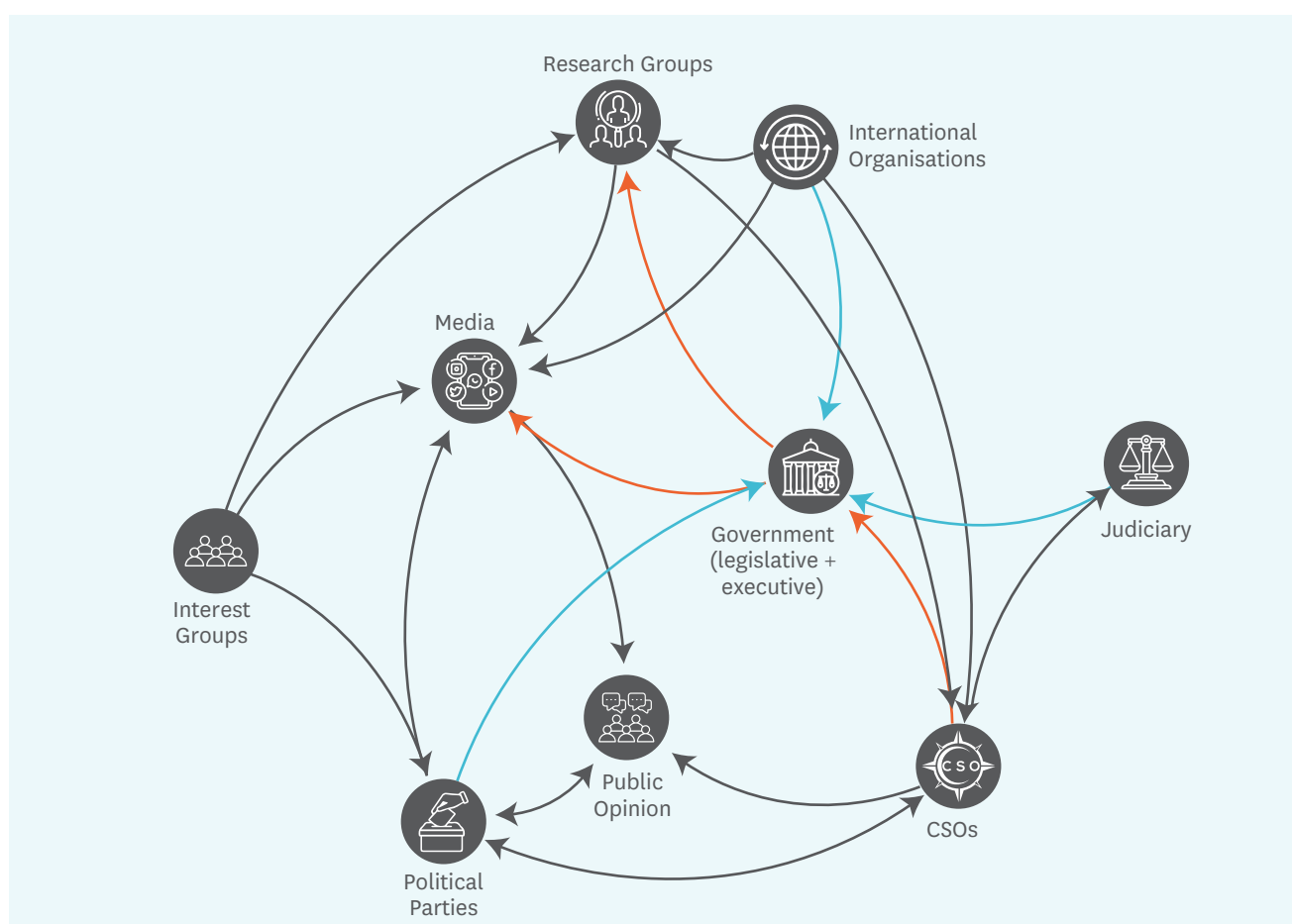
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Thirdly, the Central government has spearheaded numerous policy changes, at times in response to imminent crises, but often to address more systemic challenges that require long-term planning. One significant example in this context is the formulation of renewable energy policies (e.g., PM-KUSUM), driven by the need to combat the looming climate crisis, address concerns about economic and geopolitical risks stemming from energy dependence on foreign countries, and align with international commitments for transitioning to clean energy. The Atal Bhujal Yojana, which advocates for community management of groundwater, represents another instance of central government innovation in tackling deeply

rooted challenges within the country. Drafted and implemented with the support of the World Bank, this initiative showcases collaborative efforts to address complex issues. Government-led policy changes are often supported by evidence and policy advocacy from academicians, research think tanks, international organizations, etc., or a combination of these factors.

These categories are indicative of key pathways that affect policy formulation in India. They are not mutually exclusive. As policy formulation is a complex process, the list of policies and categories can be developed by further research¹⁶.

Figure 2: Various types of stakeholder interactions occur in the policy formulation process



Source: Authors' analysis

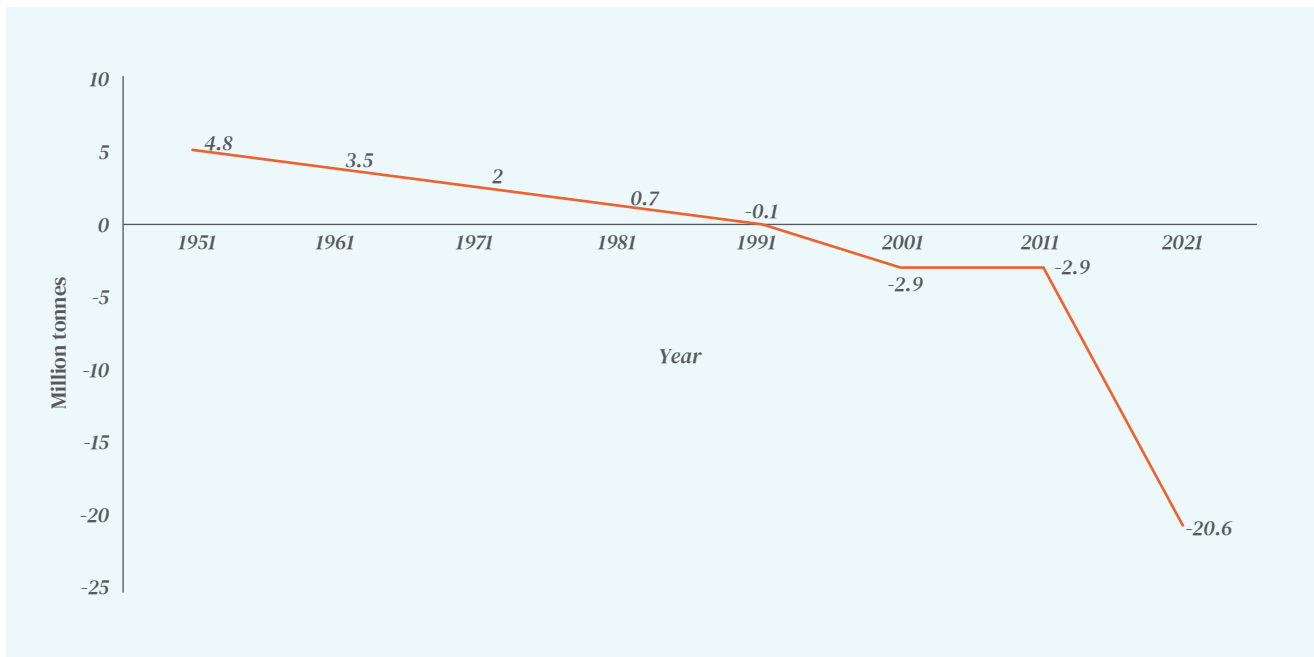
An analysis of the historical evolution of FLW policies in India would deepen the understanding of the key drivers that influence processes of policy formulation and policy change.

Before the 1970s, food shortage was a major concern for the Government of India, and achieving

self-sufficiency was the primary target. Thus, the immediate focus of the government was ensuring the availability of staple foods at stable prices. While the country imported foodgrains up to the 1980s, net imports of foodgrains has steadily declined over the decades, as illustrated in Figure 3 (Pathak, Mishra, and Mohapatra 2022).

¹⁶ A separate study that complements this report is currently underway for an in-depth policy and institutional landscape analysis (PILA) in India.

Figure 3: There has been a steady decline in the net import of foodgrains over the decades



Source: Government of India (2023a)

An Intensive Agriculture Area Programme was launched with the goal of covering 20–25 per cent of the area under intensive agricultural development. Though the programme led to a rise in productivity, it was not effective in meeting domestic food demands. As a result, a High-Yielding Variety Programme (HYVP) was introduced to enhance production. The production increased by 19.1 per cent in the post-HYVP (1963–1973) period compared to the pre-HYVP (1961–1965) period (Dhanagare 1987). The outcome of the programme was a significant rise in productivity and marked progress on the path to self-sufficiency in the production of foodgrains (Radhakrishna 2005; Pingali and Feder 2017).

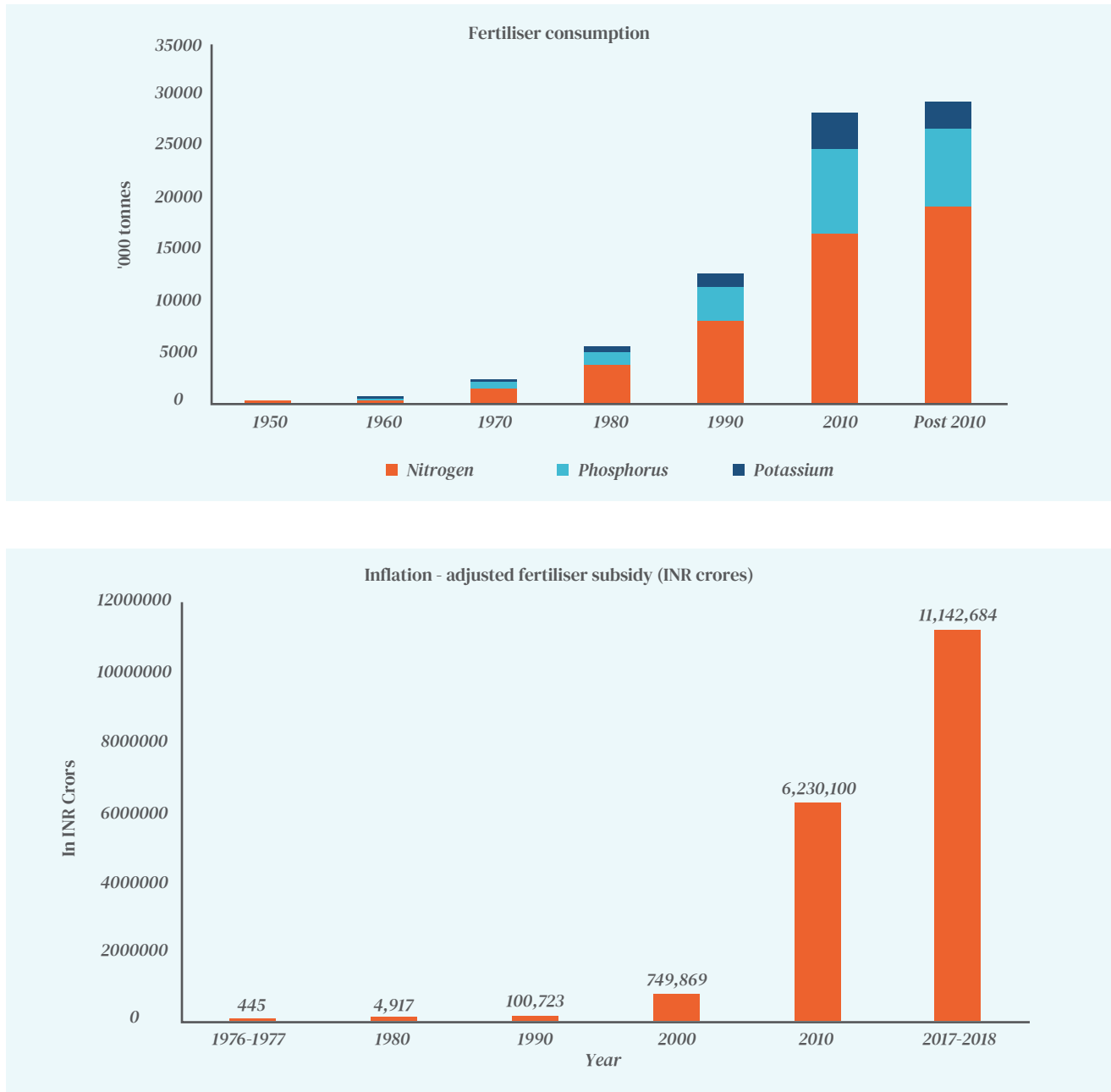
In the late 1960s, the twin policies of assured procurement of wheat and rice at MSP from farmers and the rationed distribution of foodgrains to consumers through the PDS were introduced (Pingali and Feder 2017). The PDS was started as a universal distribution programme and resulted in significant benefits being provided to the non-poor while people facing extreme poverty were not covered. This did not lead to any positive impact on the nutritional status of the poorest of the poor (Kumar, Pillay, and Manoj 2018; Acharya 2007). As a response, the Targeted Public Distribution System (TPDS) was launched in 1997. The focus was on ensuring the availability of subsidised food for the poor and vulnerable living below the poverty line. Thus, MSP helped in achieving a relatively stable

price to protect farmers, while the PDS ensured the availability of subsidised food for the poor and vulnerable.

In addition to the price support, input subsidies and credit were provided to enhance agricultural production. This was targeted towards poor farmers with small landholdings. The fertiliser subsidy saw a massive increase from the early 1980s (INR 891 crore) to 2006–2007 (INR 22,452 crore) (Malik and Pazir 2019). It nearly doubled within 15 years, starting from the 1990s, as highlighted in Figure 4. The provision of free electricity to ensure affordable irrigation was another important input subsidy that contributed to agricultural growth in India.



Hamish John Appleby/IWMI

Figure 4: Critical input subsidy led to increased fertiliser consumption

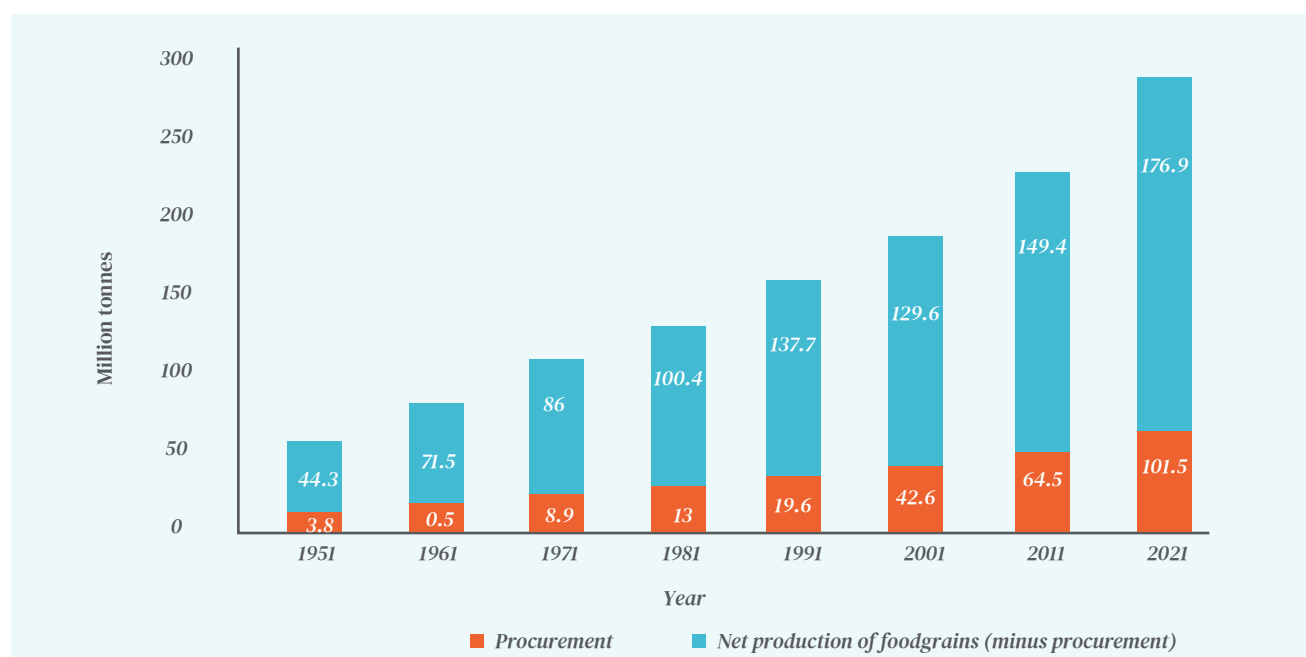
Source: Malik and Pazir (2019); World Bank (2023); Food and Agriculture Organization of the United Nations (2023)

In the 1970s, some of the existing programmes were revamped to improve farmers' credit access, and new programmes were launched to support the capital and input-intensive agriculture practices introduced as a part of the Green Revolution (Pathak, Mishra, and Mohapatra 2022; Kumar, Sivamohan, and Bassi 2022). Commercial banks were nationalised, and lending for agriculture activities was made mandatory (Kumar, Singh, and Sinha 2013).

In the 1980s, the National Bank for Agriculture and Rural Development (NABARD) was formed to

encourage agriculture and rural development. In the 1990s, NABARD introduced several programmes, such as self-help groups and the Kisan Credit Card, which helped improve financial inclusion by making hassle-free credit available to farmers. These programmes enabled credit access, resulting in an increase in quantum from INR 46,000 crore (1999–2000) to INR 13,93,000 crore (2019–2020) – a 30-time increase over 20 years. This encouraged farmers to adopt new technologies for increasing food production (Reserve Bank of India 2019).

Figure 5: By the 1980s, foodgrain production in India crossed the 100 metric tonnes (MT) mark



Source: Government of India (2023a)

By the 1980s, food grain production in India crossed the 100-metric tonne (MT) mark, and India became a net exporter of foodgrains. In this transition, there was a shift in policy goals from achieving food self-sufficiency to food and nutritional security. There were changes in consumption patterns which expanded to include products other than foodgrains with a rise in income and the emergence of malnutrition¹⁷ as a major concern (Pingali, Mittra, and Rahman 2017). An emphasis on crop diversification led to the inclusion of pulses in the PDS, the provision of MSPs for crops other than rice and wheat, and the cultivation of nutrient-fortified varieties (Kochar 2005; Kaushal and Muchomba 2015).

There was a growing concern in the 2000s about the overexploitation of resources as an outcome of the accelerating agricultural growth in the past three decades. Issues such as groundwater depletion, soil degradation, and the over-use of monocultures called for policy action. The scientific evidence on the increased occurrence of droughts and floods due to climate change also drew attention to the risk to FLW systems. Initiatives to support the sustainability of water and land resources used in agriculture practices, particularly through natural resource conservation, which includes measures to improve soil health, insurance



¹⁷ Several studies reported no effect on the intake of calories and consumption of micronutrients as an outcome of the increased cereal production and distribution through the PDS.

to offset risk to farmers, and climate-resilient agriculture practices gained traction (Parris 2010; Mishra et al. 2019; Aditya, Khan, and Kishore 2018).

Allied sectors such as fisheries, livestock, animal husbandry, and dairy have become essential to advancing integrated and sustainable food systems. The production of horticultural crops, milk, eggs, and fish increased by almost two times between 2004–2005 and 2015–2016 (Agriculture statistics, various issues published from 2022 onwards).

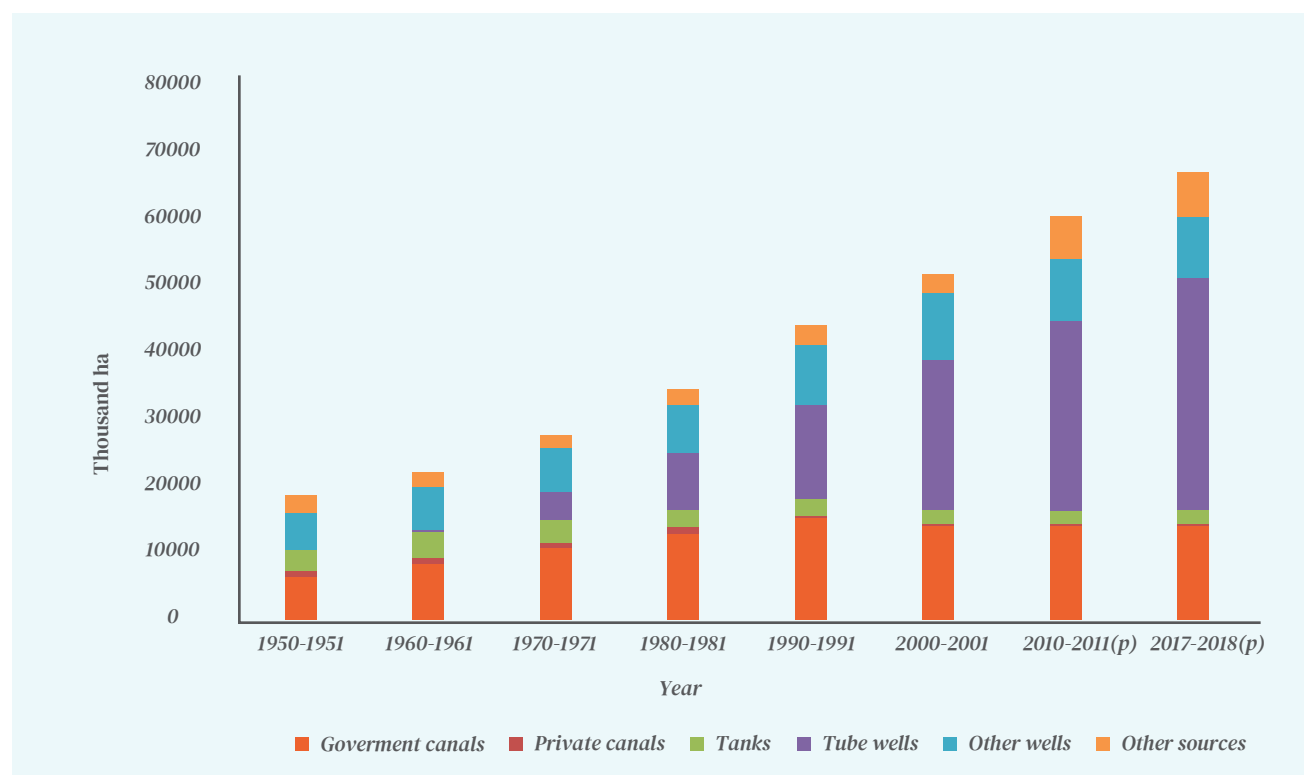
Since 2016, efforts to increase farmers' incomes have gained momentum with the specific target of doubling farmers' incomes by 2024 (Press Information Bureau 2022). The strategy involves various policies, and coherence among these policies is crucial.

The history of water use in agriculture in India shows paradigm shifts from water development to management. Between the 1950s and 1970s,

large-scale public irrigation systems were developed to support growing agricultural water requirements. Canal irrigation from rivers and large dam reservoirs were a predominant form of irrigation, restricted to agricultural lands in the command area of water sources. Therefore, investment in groundwater structures has increased since the 1970s (Figure 6). The increase in irrigation through groundwater continued despite the introduction of command area development programmes. This was a result of assured access to groundwater through electric pumps and free or subsidised electricity (Sarkar et al. 2014). As much as 60 per cent of the total groundwater withdrawn is used for irrigation.

While groundwater irrigation made possible the transition to a food-secure India, it also led to the overexploitation of groundwater. This poses a severe threat to water sustainability in many parts of western and southern India (Bassi, Vijayshankar, and Kumar 2008).

Figure 6: Surface water irrigation increased between the 1950s and 1970s while groundwater irrigation increased substantially post the 1970s



Source: Government of India (2020a)

The evolution of policies in the water sector reflects a greater inclusion of the concerns at the intersections of FLW systems (Katyaini and Barua 2016). The central government's¹⁸ National Water Policy, 2012, which acts as a guideline for state water policies, offers a comprehensive framework to address the pressing issues of water-use inefficiency, water scarcity, equity, and inclusion. This policy emphasises several critical aspects, including institutional interventions such as the National Framework Law and the Water Disputes Tribunal, with an increasing focus on community-based water resource management (Dellapenna and Gupta 2009; Bassi, Schmidt, and De Stefano 2020). It also highlights the urgent need to optimise water utilisation across various sectors while recognising the ecological requirements of rivers and water bodies. The policy prioritises both, supply-side initiatives, such as the construction of reservoirs, and demand-side management to improve water-use efficiency in irrigation to adapt to climate-induced water variability. Furthermore, it emphasises flood and drought management strategies, such as the restoration of natural drainage systems and the improvement of forecasting and preparedness measures.

To address the looming challenge of groundwater overexploitation, the central government has launched multiple programmes. These targeted programmes incentivise water-use efficiency through the application of micro-irrigation (drip and sprinklers), the creation of infrastructure to conserve groundwater, and the management of groundwater by communities.

The enactment of the land reforms acts across different states were a major step forward to bring fallow land under cultivation and increase land-use efficiency by removing intermediaries and giving tenants rights to cultivate land. This enabled a transition towards a more equitable system of land distribution away from the previous zamindari system¹⁹. These tenancy reforms were considered desirable from the perspective of both equity and efficiency.

The bundled concerns of low land productivity, food insecurity, and water-use inefficiency led to the adoption of programmes on soil conservation, intensive area development, and irrigation development in rainfed areas. However, in response to an evolving understanding of the issues



¹⁸ State responsibilities relate to irrigation, drainage, storage, and more. The central government's authority is limited to inter-state water disputes concerning rivers and matters related to navigation on national waterways, tidal waters, and territorial waters (Dellapenna and Gupta 2009; Bassi, Schmidt, and De Stefano 2020).

¹⁹ The zamindari system here refers to the land tenure system from the British colonial period, in which zamindars acted as intermediaries who were given land proprietorship by the British colonisers against an annual rent that was paid through collecting revenue from farmers.

of food insecurity, land degradation, droughts, low technical efficiency, and soil erosion, a second phase of land reforms took place. These involved the introduction of land ceiling acts and the consolidation of holdings. In this phase, programmes focused on the development of drought-prone areas, soil conservation and improvement of soil health, and reduction of land degradation. This evolution in FLW policies indicates two key aspects: first, the sector-specific approach has created certain issues for the sustainability of linked resources; second, policies are evolving to recognise the interlinkages between resources and to address these coupled issues. These are evident in the present structure of the departments concerned with agriculture, land, and water.

In the present context, the FLW sectors fall under the jurisdiction of individual states. Decisions regarding these sectors are typically managed by state authorities. Despite this allocation of powers to states, the central government in India sets the stage and guides the states through resource-specific ministries and departments.

The Department of Agriculture and Farmers' Welfare is one of three important departments under the aegis of the Ministry of Agriculture and Farmers' Welfare²⁰. The department is organised into 28 divisions that oversee rainfed agriculture, drought risk management, extension services for farmers, important categories of crops like oilseeds (Government of India 2022a), marketing, and credit-related activities. Further, the department has 21 subordinate offices across the country to coordinate with the state and implement central policies. There is also support from attached offices, autonomous bodies, and national-level cooperative organisations for the functioning of the department.

The Department of Land Resources, under the MoRD in India, aims to improve land productivity and associated livelihood potential. It particularly focuses on rainfed areas under cultivation and culturable wastelands. It also focuses on the development of an appropriate and integrated land information management system to support the updating of real-time information, enable the optimal use of land resources, and assist in planning and policy processes. To achieve these objectives, the department engages in matters of

land reforms, land tenure, and land records. It implements watershed programmes in rainfed and degraded areas, guides and helps states to modernise land record management and develop information systems, and facilitates the adoption of policies for the rehabilitation and resettlement of displaced people (Government of India 2022b).

The MoJS is the nodal agency for water resources and is responsible for overall planning, formulation of policies, and coordination and guidance for water management in India. Its subordinate office, the Central Ground Water Board, is in charge of groundwater management. The ministry is also responsible for providing technical guidance, clearances, and monitoring of both major and medium irrigation projects (Government of India 2023a). However, irrigation efficiency through micro-irrigation is under the jurisdiction of the Ministry of Agriculture and Farmers Welfare (Kim et al. 2018).

With this background on the pathways to policy-making, policy evolution, and the present structure of the departments concerned with FLW, the next section outlines the methodology followed to gain insight into policy coherence.



²⁰ The other two are the Department of Animal Husbandry, Dairying and Fisheries and the Department of Agricultural Research and Education.

3. Methodology



The section presents two sets of methodological steps. The first set of steps is for shortlisting prominent policies pertaining to FLW systems based on the policy landscaping exercise. Recognising the vast landscape of policies governing FLW systems of India. The study focuses on a few key policies for an in-depth policy coherence analysis. In light of both feasibility and relevance, the analysis is confined to central policies only, which still leaves a vast area to choose from.

The second set of steps helps generate insights into the systematic approach followed to carry out the analysis of the seven prominent central policies along the key dimensions of policy coherence.

3.1. Policy landscaping for selecting policies

The policies were selected by creating a database on central-level policies pertaining to the FLW sector; from this policy landscape, certain methodological steps were followed to select seven key policies for the in-depth analysis. These steps have been substantiated in Figure ES 1.

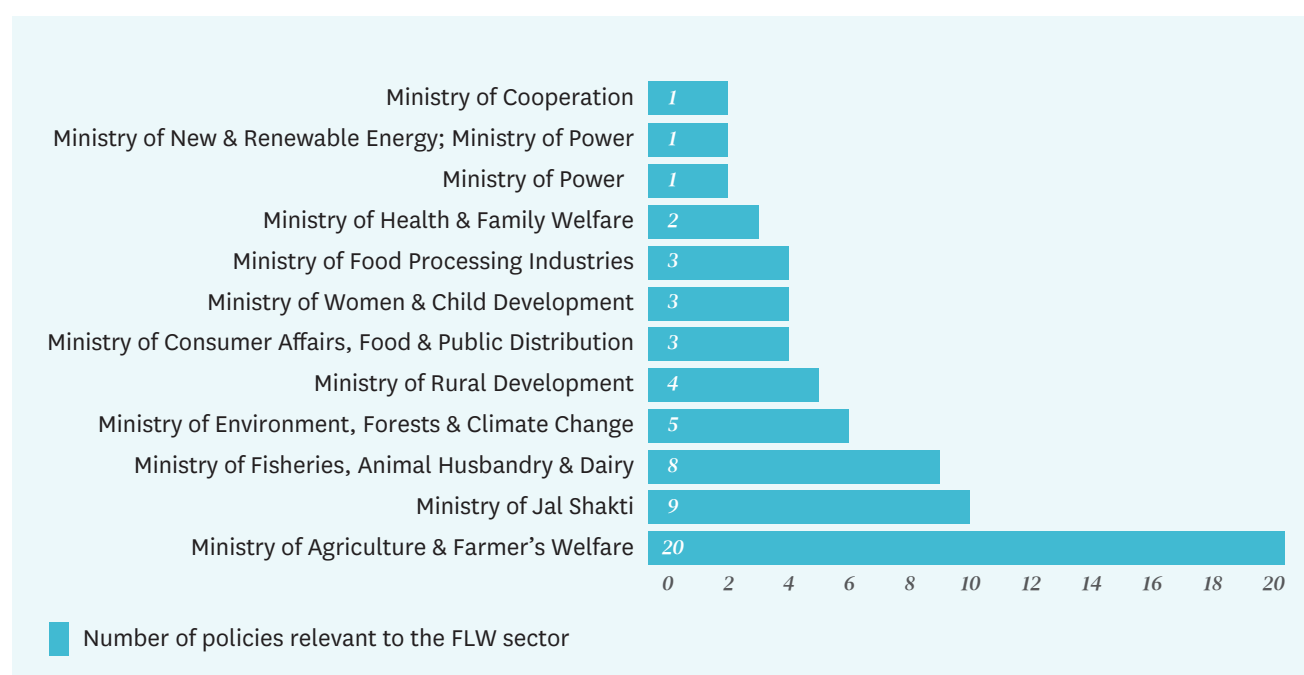
3.1.1. Shortlisting central policies encompassing the FLW systems

A database on central policies from 12 ministries covering FLW systems was created. These ministries are concerned with agriculture and farmers' welfare; water; fisheries, animal husbandry and dairy; environment, forest, and climate change; rural development; women and child development; health and family welfare; power; and cooperation (Figure 7).



Prashanth Vishwanathan/IWMI

Figure 7: A total of 20 policies from the Ministry of Agriculture and Farmers Welfare were screened the highest across the 12 ministries



Source: Authors' analysis

Information on the policies was gathered from the respective ministry portals, policy guidelines, press notes, annual reports, and the literature. It was compiled based on specific indicators, as follows:

- General information encompasses the form of the policy, nodal department, and duration of the policy.
- Allocation of financial resources²¹ covers the total budget allocation and the actual budget for three financial years, i.e., from 2018–2021. This also covers the fund-sharing provisions between the centre and the state and with the beneficiary.
- Policy objectives and activities comprise the key aspects that reflect the priorities to achieve these objectives.
- Information on partners and convergence consists of the explicit recognition of departments with whom convergence is instrumental.

The policies' objectives and activities were then mapped to One CGIAR impact areas. These impact areas reflect broader developmental goals that are significant to understanding the interlinkages between the FLW systems.

- Climate adaptation and mitigation focuses on improving small-scale producers' resilience and reducing greenhouse gas emissions from food systems.
- Gender equality, youth, and social inclusion targets closing the gender gap and enhancing opportunities for youth in FLW systems.
- Environmental health and biodiversity are centred on efforts to increase productivity in food systems while staying within environmental boundaries and maintaining biodiversity.
- Poverty reduction, livelihoods, and jobs are focused on lifting people out of poverty with a focus on extreme poverty in rural areas.
- Nutrition, health, and food security refers to ending hunger and enabling safe, affordable, healthy diets for the world's most vulnerable people (CGIAR 2021).

3.1.2. Selecting policies for deep-diving into policy coherence

From the database, 10 policies were shortlisted based on five quantitative criteria, explained in Table A1 in Annexure 1. The first quantitative

criterion concerned the implementation mechanism in place for policy action. Criteria two and three referred to the selection of policies that are cross-sectoral and cover three or more One CGIAR impact areas, with the inclusion of environmental health and biodiversity to reflect environmental sustainability. These criteria aimed to ensure that the policy has a broad reach and can have significant effects in multiple areas; meanwhile, the sustainability criteria was chosen to restrict the selection to policies linked to environmental sustainability. The fourth criterion was time span, which was chosen to filter out the policies enacted on or before 2020. This was to ensure that the policy was operational for at least three years, and that a thorough examination of its implementation and impacts can be carried out. The last criterion concerned impact, scope, and level of ambition. Budget expenditure was taken as a proxy for the potential impact and scope of the policies. The shortlisted policies were ranked based on their average actual budget expenditure in 2018–2021.

A final set of seven policies was identified based on four qualitative criteria and consultations with stakeholders, explained in Table A2 in Annexure 1. These criteria were not ranked or weighted; instead,



²¹ Source: Notes on demand for grants of different ministries as provided on the Ministry of Finance's website

they served as guiding principles for discussions with stakeholders regarding the final selection of policies. The first criterion was policies requiring coordination among multiple government agencies for their implementation. This was taken as a reflection of vertical and horizontal institutional coherence. The second pertained to policies in which social inclusion was an important parameter for success. The third highlighted policies in which the objectives implied cross-sectoral dependency in the form of external consistency. The last pertained to policies in domains that require flexibility and adaptability to change.

The selection process was designed to be flexible and included inputs and insights from policymakers aware of the local context. Therefore, multiple consultations were conducted with NITI Aayog during the selection process. These consultations were with the verticals on water resources, land resources. From these consultations, three areas of interest emerged: (1) carbon sequestration; (2) sustainable agriculture and water; and (3) fisheries. The shortlisted policies were mapped onto these areas of interest. The consultation with the water resources and land resources vertical highlighted the importance of the following three policies - watershed development components of PMKSY, ABY, and NMCG-NGP, therefore their inclusion was crucial in the analysis of policy coherence. The policies selected from this process are mentioned in Section 4.2.

3.2. Analysing policy coherence in selected policies

The second set of methodological steps covers four key stages of analysing policy coherence in the selected policies. These are designing a research tool, using it to conduct consultations with experts, analysing the qualitative data collected through these consultations, and validating the analysis through national consultations.

3.2.1. Designing the research tool

The three primary sources of qualitative data for this research were policy guidelines, the existing literature, and expert consultations. A structured questionnaire was developed to understand the key dimensions of policy coherence. The questionnaire was developed in reference to two key sources – the United Nations Environment Programme (UNEP) Composite Indicator Framework (United Nations n.d.) and CEEW studies analysing policies on environmental and natural resources. The UNEP

framework was considered the most appropriate because of its comprehensive coverage of policy coherence dimensions. The CEEW studies had a thematic focus on policy coherence for the water-energy-food nexus.

The questionnaire was designed to cover five qualitative criteria: horizontal and vertical institutional coherence, external consistency, scope for convergence, flexibility and adaptability, and social inclusion. These were examined across the policy formulation, implementation, M&E, and impact evaluation stages of the policy cycle (for the detailed questionnaire, please refer to Annexure 3). The questionnaire was intended for consultations with experts from governmental agencies and CSOs who hold a long-term and in-depth understanding of the policy cycle.

Once developed, the questionnaire underwent three rounds of review by a multidisciplinary team that has thematic specialisation in water, land, and agriculture. The objective of these reviews was to enhance the questionnaire's relevance to the Indian context. Subsequently, it was pilot-tested internally with the team members to overcome any remaining anomalies in the logical sequence of the questions.

3.2.2. Conducting expert consultations

The nodal officers from the concerned governmental departments were approached for consultations. From the non-governmental sector, academicians, researchers, and practitioners from CSOs were approached. The expert consultations were organised after several follow-ups. Around 71 per cent of the nodal officers approached agreed to an interview or nominated someone in their place for the consultation. Approximately 80 per cent of the experts from the non-governmental sector who were approached participated in the consultations. In total, 24 people were interviewed for the seven policies. A few of these consultations were in the form of focus group discussions. Confidentiality was maintained by anonymising their responses.

3.2.3. Analysing the qualitative data

The key aspects that emerged from the policy guidelines and consultations were systematically organised in an analytical framework designed for a comprehensive analysis (see Annexure 2). The data collected were analysed using content analysis. The analysis began by securing an understanding of each policy's evolution, followed by a thematic analysis along the five key aspects of policy coherence in the context of India.

- Horizontal and vertical institutional coherence covers coordination mechanisms between two or more government agencies. Coordination between different levels of government (centre, state, and district) is referred to as vertical coherence, and coordination across different ministries/departments at the same level of governance is referred to as horizontal coherence. Further analysis was carried out on the involvement of local bodies such as urban local bodies, gram panchayats (GPs), and CSOs in the policy cycle.
- External consistencies refer to the extent to which particular policy objectives are aligned with other existing policies. Also, it requires that domestic policies be in alignment with broader development objectives, such as SDGs.
- Scope for convergence comprises the existing enabling mechanisms for leveraging resources and institutions across different government policies for implementation and the associated challenges that may act as barriers to strengthening such convergence.
- Flexibility and adaptability of the policies refer to their ability to manage unanticipated changes that could have important societal consequences.
- Social inclusion refers to the inclusion of the concerns and interests of the vulnerable sections of society.

3.2.4. Validating the findings through national-level consultation

The findings from the above analysis were then shared through a half-day stakeholder consultation organised in New Delhi on 16 June 2023 (Figure 8). The event was chaired by Ms Debashree Mukherjee, secretary, MoJS, and co-chaired by Mr Avinash Mishra, Former Adviser, Water and Land Resources, NITI Aayog. Experts invited from the government, academia, and civil society participated in the consultation. Valuable feedback and discussions on the findings of the analysis were gathered during the event and later integrated into the final analysis (Taneja et al. 2023).

Figure 8: The national-level stakeholder consultation held on 16 June 2023 saw participation from government, academia, and CSOs



Source: CEEW, New Delhi, 2023

4. Results and Findings



This section contains the results and findings of the FLW policy landscaping at the national level and an in-depth analysis of the policy coherence of the seven selected policies.

4.1. Policy landscaping of the FLW system

This section covers the findings of mapping central policies to One CGIAR Impact areas and the analysis of the allocation of financial resources to gender equality and social inclusion (GESI).

4.1.1. Mapping of FLW policies to One CGIAR Impact areas

The study finds that more than 75 per cent of the 60 central-level policies relevant to FLW systems are from five ministries: Ministry of Agriculture and Farmers Welfare (19); the MoJS (9); the Ministry of Fisheries, Animal Husbandry and Dairy (8); the Ministry of Environment, Forests and Climate Change (5); and the MoRD (5). More than 50 per cent of the 60 policies are concerned with the food sector, followed by the water and land sectors.

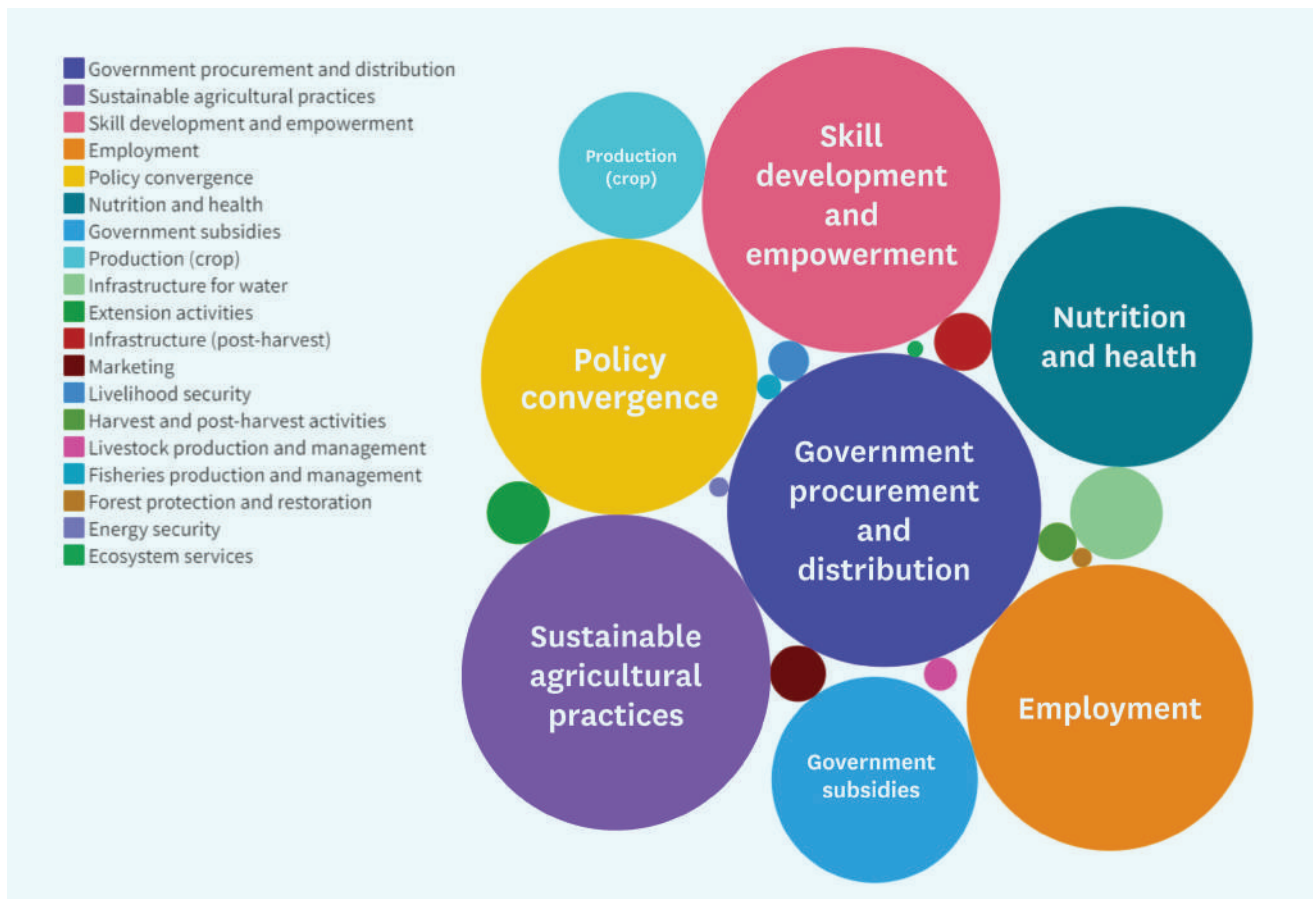
Around 57 per cent of the 60 policies were mapped onto at least three or more One CGIAR impact areas, while only 15 per cent referred to only one impact area. This indicates the extent to which most policies in the FLW sectors have cross-cutting and varied impacts and emphasises the need for better policy coherence in implementation to uncover their full potential. Most policies aligned with the impact areas of nutrition, health, and food security and poverty reduction, livelihoods, and jobs (Figure ES 2). There was also a moderate focus on climate adaptation and mitigation and environmental health and biodiversity, with close to 50 per cent of the policies aligning with these two impact areas. Their focus was primarily on the adoption of water and energy-efficient technologies, climate-smart technologies, drought-proofing and flood management activities, solarisation of pumps, enhanced forest cover, and ecosystem services. Interestingly, there was a relatively less explicit focus on gender equality, inclusion and diversity. Food sector policies, specifically those related to child nutrition and health, exhibited a relatively stronger gender component compared to the land and water sector policies. In many cases, the integration of gender in FLW policies was limited to budgetary allocation or participation rates. While these are important first steps, there is scope for more gender-transformative actions.

The policies are further categorised into various primary focus areas based on the analysis of their guidelines. Our objective was to gain insight into how different central-level policies are oriented towards various aspects of FLW systems. The study classifies the policies into 21 focus areas of which the predominant ones are the promotion of sustainable agricultural practices (23 per cent of policies), followed by improvement in crop production (15 per cent), investment in water infrastructure (13 per cent), skill development and empowerment (13 per cent), and extension activities (12 per cent) (Figure 9). The size of each circle in Figure 9 corresponds to the budget allocation for a particular thematic area. Notably, a substantial amount of the budget is allocated to policies falling under the thematic areas of government procurement and distribution, followed by sustainable agriculture practices, skill development and employment, policy convergence, and nutrition and health. In contrast, relatively lower budget is allocated for ecosystem services, energy security, forest protection and restoration, as well as fisheries production and management.



Hamish John Appleby/IWMI

Figure 9: Budgetary expenditures of FLW policies across thematic areas show one of the highest allocations towards policy convergence



Source: Authors' analysis

The FLW policies covered 11 per cent of the average annual union budget expenditure. This excludes expenditure on fertiliser subsidies. Around 7 of 11 per cent is covered by the food sector, followed by the water and land sectors. Approximately 10 of 11 per cent of the budget is covered by the five ministries mentioned previously; these have the highest number of policies included in this analysis. An analysis of budgetary expenditures also reveals an interesting pattern regarding the allocation of funds for specific policies, thematic focus points, and marginalised groups, including women, Scheduled Castes (SC), and Scheduled Tribes (ST).

Budget expenditure data for 11 of 44 policies in the FLW sectors is available for the financial year 2021–2022. Expenditure on these policies accounted for approximately 25 per cent of the union government's total gender budget and only 1 per cent of the total union budget expenditure. Noteworthy investments have been made in MGNREGA, Saksham Anganwadi and Poshan 2.0, National Rural Livelihood Mission (NRLM),

Paramparagat Krishi Vikas Yojana (PKVY), and National Mission on Sustainable Agriculture (NMSA)-National Project on Agroforestry, all of which underscore a concerted effort to address gender disparities and enhance the well-being of women across various sectors. MGNREGA, Saksham Anganwadi and Poshan 2.0, and NRLM collectively account for 97 per cent of the total gender budget expenditure in the FLW sector. However, there is also room to increase gender-focused investments across other FLW sector policies.

Budget allocations for SC and ST groups in the FLW policies are notably high, with more than 80 per cent of the funds allocated to SC and ST groups. Approximately 51 per cent of the union government's total budget expenditure was on SC and 49 per cent on ST in 2021–2022, representing 2 per cent and 1 per cent of the total union budget expenditure, respectively.

The next sub-section elucidates the in-depth policy coherence analysis of the selected policies.

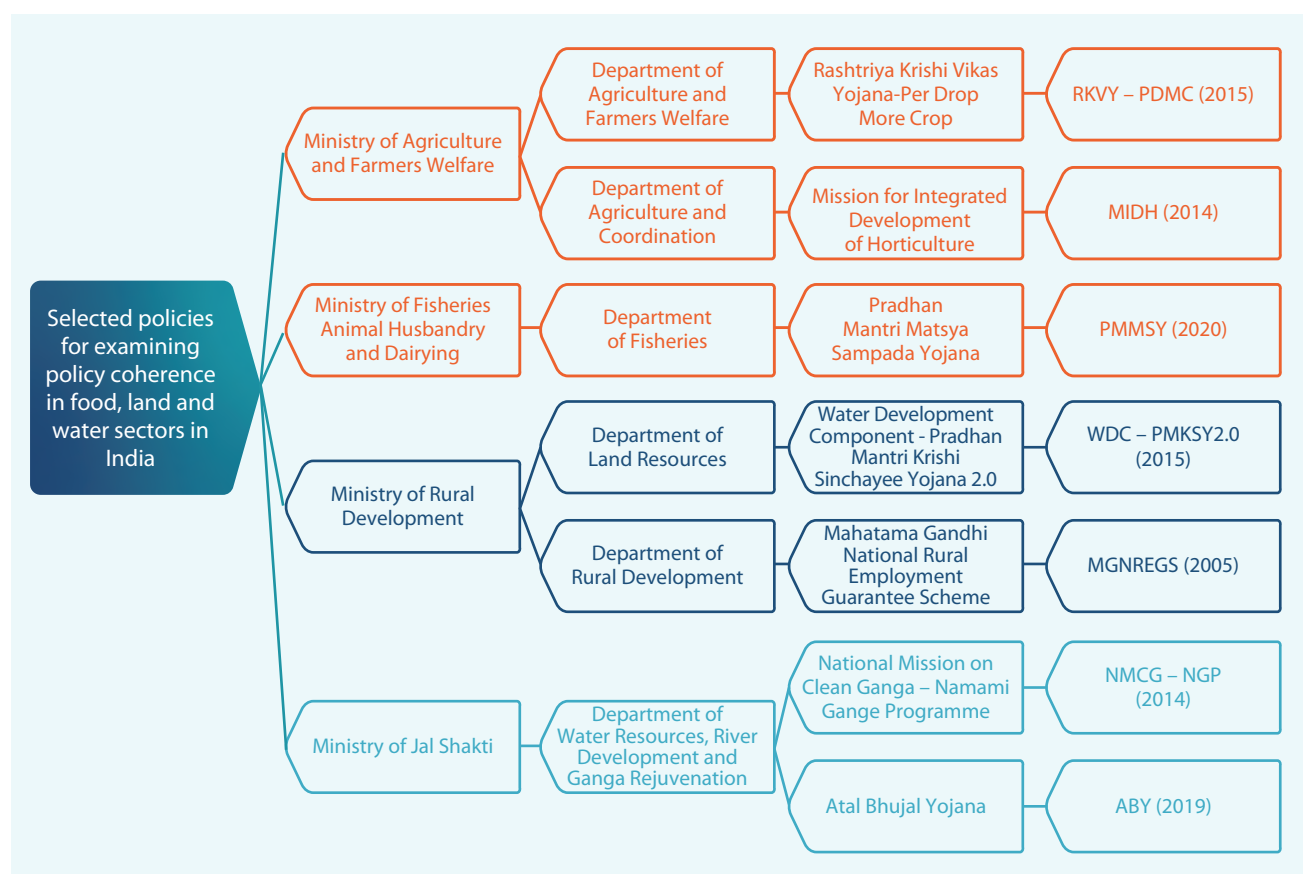
4.2. Selected policies for policy coherence analysis

As explained in the methodology, seven policies were systematically selected for an in-depth policy coherence analysis. Figure 10 lists their analysis in detail.

NMCG-NGP and ABY were included in the analysis based on suggestions by NITI Aayog. ABY was designed to leverage existing policies; therefore, it is an important policy in the understanding of policy coherence.

Subsequent sub-sections highlight the relevance of the seven policies concerning the interlinkages between the FLW systems. More information on the policies can be found in Annexure 5.

Figure 10: Analysis of seven policies across four ministries to examine policy coherence



Source: Authors' analysis

4.2.1. Rashtriya Krishi Vikas Yojana – Per Drop More Crop (RKVY-PDMC)

RKVY-PDMC traces its origins to the PMKSY, a central government policy launched in 2015. The key objective of the policy is to enable efficient water use in agriculture. PMKSY integrated irrigation-related initiatives, such as the Accelerated Irrigation Benefit Programme (AIBP), Integrated Watershed Management Programme (IWMP), and the On Farm Water Management (OFWM), component of the NMSA. It also classified irrigation activities into four sub-policies. PDMC, one of the four, aims to enhance water-use efficiency at the farm level by promoting micro-irrigation systems, such as drip and sprinkler irrigation (Government of India 2021a).

The RKVY-PDMC initiative promotes effective water usage in agriculture to improve agricultural output, productivity, and efficiency. It also facilitates local-level storage and water conservation initiatives to complement the establishment of water sources for micro-irrigation systems. They have proven to significantly increase crop yields and conserve water and energy. Existing research suggests that adopting micro-irrigation practices can lead to substantial water savings of 50–90 per cent, energy savings of 31 per cent, and fertiliser savings of 29 per cent (Kumar et al. 2021). Micro-irrigation also mitigates issues related to weed proliferation, soil erosion, and the expenses associated with labour-intensive farming practices (Bahinipati and Vishwanathan 2019). Thus, RKVY-PDMC is critical when addressing the FLW nexus.

4.2.2. Mission for Integrated Development of Horticulture (MIDH)

MIDH is a centrally sponsored scheme (CSS) that operates a cluster of schemes, missions, and boards previously set up in a silo-based manner. The primary objectives of the mission are to foster the holistic growth of the horticulture sector through contextual strategies, including research, technology promotion, extension, post-harvest management, processing, and marketing; encourage the collectivisation of farmers into farmer groups to improve horticulture production, augment farmers' incomes and support nutritional security; improve productivity and water-use efficiency through micro-irrigation; and support skill development and employment generation opportunities for rural youth in horticulture and post-harvest management (Government of India 2014).

MIDH addresses the FLW nexus by implementing practices that optimise resource use and promote sustainable agricultural development. The policy encourages the cultivation of diverse crops, including fruits and vegetables. This diversification helps reduce the pressure on specific crops, which could otherwise lead to soil degradation and water depletion (Sehgal Foundation 2022). The MIDH also promotes water-efficient practices, such as drip and sprinkler irrigation, and the creation of water resources infrastructure. Further, the produce of the MIDH has the scope to improve food as well as nutritional security.

4.2.3. Pradhan Mantri Matsya Sampada Yojana (PMMSY)

The core objective of the PMMSY, whose nodal agency is the Department of Fisheries of the Ministry of Fisheries, Animal Husbandry and Dairying, is to bring about a blue revolution through the sustainable and responsible development of the fisheries sector. PMMSY aims for the ecologically healthy, economically viable, and socially inclusive development of the fisheries sector of India (Government of India 2020a). Specific activities planned under the policy are: (1) harnessing fisheries sustainably and equitably; (2) enhancing fish production and productivity through the productive use of land and water; (3) modernising and strengthening the value chain; (4) doubling fishers and fish farmers' income and employment generation; (5) improving contribution to the economy and exports; (6) creating social, physical, and economic security for fish farmers; and (7) enabling robust management and regulatory frameworks of fisheries (Government of India 2020c).

Policies concerning fisheries, such as the PMMSY, could play a significant role in addressing convergences in the FLW sector by promoting sustainable aquaculture and fisheries practices that optimise resource use and contribute to food security. PMMSY illustrates the potential of fisheries to promote sustainable, responsible, inclusive, and equitable aquaculture. The policy boosts the livelihoods of fisherfolk and enhances nutritional security. It also promotes the sustainable and productive use of water resources.



4.2.4. Pradhan Mantri Krishi Sinchayee Yojana – Watershed Development Component (WDC-PMKSY)

WDC-PMKSY 2.0 is a flagship programme aimed at promoting sustainable watershed development and management. The WDC-PMKSY 2.0 specifically targets rain-fed areas to address issues associated with water scarcity and soil erosion through watershed development. It focuses on conserving rainwater, improving soil moisture, and enhancing the overall productivity of agricultural land. It is part of the larger programme of PMKSY, which aims to (1) converge irrigation investments; (2) expand the cultivable area with assured irrigation; (3) improve water-use efficiency; (4) promote precision

irrigation; (5) recharge aquifers; and (6) explore the reuse of treated wastewater for peri-urban agriculture, attracting private investment in precision irrigation systems. Therefore, the policy directly addresses the FLW nexus (Government of India 2019a).

Watershed development policies like the WDC-PMKSY are designed to address the FLW nexus by focusing on the integrated and holistic management of land and water resources within a specific watershed area. The WDC-PMKSY involves a range of activities that aim to improve soil health, water availability, and overall agricultural productivity, and to prevent soil erosion through contour bunding, terracing, and reforestation. These practices help maintain soil fertility, reduce sedimentation in water bodies, and promote sustainable land use. The policy also emphasises water-harvesting activities, such as the construction of check dams, percolation tanks, and other water storage structures. These structures help in harvesting rainwater, recharging groundwater, and improving the overall availability of water for irrigation and domestic use. The activities could also improve soil moisture, which is an important element in agriculture. WDC activities focus on enhancing agricultural practices by carrying out activities that boost the productivity of various crops.

4.2.5. Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS)

The Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA), also known as the Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS), is an important policy for the livelihood security of the marginalised in rural India (Government of India 2022c). It provides a legal guarantee for employment in rural areas for up to 100 days in a financial year. MGNREGS, whose nodal agency is the MoRD, involves extensive coordination with state governments because the act aims to strengthen decentralisation by authorising local governance bodies called panchayati raj institutions (PRIs) (UNDP 2013).

Within the overarching aims of poverty alleviation and addressing rural development challenges, the MGNREGS has four key objectives. These are strengthening the livelihood resource base of the poor, supporting demand-driven productive asset creation, proactively ensuring social inclusion, and strengthening PRIs (Government of India 2022d).

MGNREGS addresses the FLW nexus through its various provisions and activities, which aim to improve rural livelihoods, enhance land productivity, and promote sustainable water management. It also includes activities related to water conservation, such as the construction of check dams, ponds, wells, and other water-harvesting structures, which help recharge groundwater, enhance water availability for irrigation, and mitigate water scarcity. The policy supports activities such as afforestation, tree planting, and soil and moisture conservation, which help improve soil health, prevent erosion, and contribute to sustainable land use and increased agricultural productivity. MGNREGS offers opportunities for livelihood diversification beyond agriculture, such as in creating community assets, developing small-scale infrastructure, and skill-building activities. This reduces the pressure on agricultural land and enhances food security. The policy also promotes water-efficient irrigation techniques, such as farm ponds, drip irrigation techniques and sprinkler systems. These practices optimise water use and support agricultural productivity, addressing the water-food nexus.

4.2.6. National Mission for Clean Ganga – Namami Gange Programme (NMCG-NGP)

The key objectives of the NMCG-NGP are ensuring the effective abatement of pollution, rejuvenating the river, and maintaining the minimum ecological flows in the river (Government of India 2023b). It developed a holistic river basin strategy to overcome the challenges of inadequate sewerage infrastructure, lack of funds, and suboptimal results due to poor operation and maintenance (O&M) (Government of India 2017). The National Ganga River Basin Authority (NGRBA), constituted in 2009 under the provisions of the Environment (Protection) Act (EPA), 1986, was mandated to undertake comprehensive planning and management functions through the adoption of a basin-wide approach (Government of India 2017).

The nodal agency for the implementation of this programme is the Department of Water Resources, River Development, and Ganga Rejuvenation under the MoJS. MoJS came into existence through the merging of the Ministry of Water Resources, River Development and Ganga Rejuvenation and the Ministry of Drinking Water and Sanitation.

The NMCG-NGP addresses the FLW nexus by focusing on the restoration, conservation, and sustainable management of the Ganga river and its

associated ecosystems. The NMCG and its projects, including the NGP, aim to improve water quality, enhance ecological health, and promote sustainable livelihoods in the Ganga river basin. By improving water quality, the programme supports sustainable aquatic ecosystems and safeguards water resources used for irrigation and other agricultural activities. Efforts to control riverbank erosion help prevent the loss of agricultural land and reduce sedimentation in water bodies. This contributes to maintaining fertile soil for crop cultivation.

4.2.7. Atal Bhujal Yojana (ABY)

ABY, a central sector scheme, launched under the Jal Jeevan Mission, aims to promote sustainable groundwater management and is to be implemented over five years. The policy has a total outlay of INR 6,000 crore, of which INR 3,000 crore is a loan from the World Bank and the other INR 3,000 crore is from the Indian government. The primary objective of ABY is to demonstrate and scale up “community-led”, sustainable groundwater management. The policy focuses on improving the management of groundwater resources in 37 per cent of the water-stressed blocks (229) in India in seven states: Gujarat, Haryana, Karnataka, Madhya Pradesh, Maharashtra,

Rajasthan, and Uttar Pradesh (Government of India 2021b).

ABY’s primary focus is addressing the FLW nexus by promoting sustainable community - led groundwater management. Groundwater plays a crucial role in supporting agriculture, which is closely tied to food production and land use. By ensuring the availability of adequate and reliable groundwater, the policy supports agricultural activities and enhances food production. Efficient groundwater management through policy activities could lead to improved irrigation practices, which can reduce water wastage and enhance crop yields. Sustainable groundwater management allows for better planning of cropping patterns. ABY can help farmers optimise irrigation techniques and crop choices, thus ensuring water availability for diverse crops and enhancing overall food production. The policy’s focus on groundwater recharge and conservation can also help alleviate water stress in areas dependent on groundwater for irrigation. Proper groundwater management contributes to the maintenance of soil moisture levels, which is crucial for healthy plant growth.

For a detailed understanding of these policies, please refer to Annexure 5.



4.3. Rashtriya Krishi Vikas Yojana Per Drop More Crop

The following sections outline the analysis for RKVY PDMC across vertical and horizontal institutional coherence, external consistency, scope for convergence, flexibility and adaptability and social inclusion. It also highlights the key findings for the policy.

4.3.1. Vertical and horizontal institutional coherence

The RKVY-PDMC has a comprehensive institutional structure at the horizontal and vertical levels with three well-defined tiers. At the national level is the National Steering Committee (National Steering Committee (NSC)) for the strategising and formulation of policy and the National Executive Committee (NEC) for its implementation. The NEC is headed by NITI Aayog. The National Committee on Precision Agriculture and Horticulture (NCPAH) is responsible for monitoring the progress of the policy, while the National Rainfed Area Authority (NRAA) is responsible for mid- and end-term evaluation.

At the state level, state agriculture departments are the nodal agencies. A state-level sanction committee (SLSC) is dedicated to sanction projects and activities, and agencies are appointed by the government for the M&E of the policy. At the district level, there is a district-level implementation committee (DLIC) with the representation of line departments, farmers, micro-irrigation technology companies, and leading CSOs.

Vertical institutional coherence exists through monthly review meetings to resolve challenges between the central and state departments of agriculture and farmers' welfare. CSOs, GPs, and grassroots-level institutions, such as farmer producer organisations (FPO) and water user associations (WUA), are also involved in the formulation of community projects (Government of India 2021a) (Table A3 and Table A4).

4.3.2. External consistency

The RKVY-PDMC guidelines specify the need to streamline resources for effective implementation on the ground. The policy has external consistency with MGNREGS and ABY. It facilitates water storage for micro-irrigation in conjunction with MGNREGS. Optimisation exercises with ABY are also carried out in the procurement of micro-irrigation pump sets to

avoid any kind of duplication and overlapping.

There are clear linkages of RKVY-PDMC with the SDGs. It has high- and medium-level positive impacts and neutral impacts in the thematic area of nutrition, health, and food security; medium-level positive impacts on poverty reduction, livelihoods, and jobs; and highly positive and direct impacts on climate change adaptation and mitigation, environmental health and biodiversity, and gender equality, youth, and social inclusion (Table A11).

RKVY-PDMC contribution to SDG 15.3 on combating desertification

“Desertification is caused by many conditions, such as dryness, water stress, and low precipitation. Thus, promoting the micro-irrigation system under RKVY-PDMC helps retain soil moisture and can contribute directly to combating desertification” (environmental economics expert).

4.3.3. Scope for convergence

The policy has a large scope for convergence at the interface of food and water. Enabling mechanisms in the form of the National Inter-departmental Steering Committee and regular meetings with states enhance policy coherence. A foreseeable challenge in convergence is stimulating behavioural change among farmers to adopt less water-intensive crops when market signals and energy subsidies encourage the cultivation of water-intensive cash crops, such as sugarcane. Another challenge is that, in the present version of the operation guidelines, convergence between different policies is not explicitly mentioned. The revised guidelines should clearly define convergence with other policies. Convergence can be built by bringing energy into the FLW nexus and repurposing energy subsidies for water and food security.

4.3.4. Flexibility and adaptability

The National Inter-Departmental Steering Committee acts as a platform for adjusting to uncertainties through deliberation. Similarly, regular meetings with various state representatives provide opportunities for the state to bring to the discussion issues, concerns, and challenges to making the policy more flexible and adaptable. States can enhance flexibility and adaptability by observing the best practices to overcome uncertain

social and economic changes. For instance, under the Tamil Nadu Irrigated Agriculture Modernisation Project (TNIAMP), the model village concept (MVC) is being pilot-tested to explore the efficiency of micro-irrigation in different agro-climatic settings. The TNIAMP is exploring numerous cropping patterns and varied energy sources.

4.3.5. Social inclusion

According to the stakeholder consultation, social inclusion under the RKVY-PDMC takes place through the representation of gender experts, thematic institutions like NABARD and NRAA, and

policy institutions, such as NITI Aayog, at the formulation stage. The guidelines explicitly state that the beneficiaries of the policy would be small and marginal farmers, women, and SC and ST groups. The funds are allocated such that 50 per cent is provided to small and marginal farmers; 30 per cent to women farmers; 16.5 per cent to farmers belonging to SCs; and 8 per cent to STs.

4.3.6. Key findings

Figure 11 highlights the key findings from the analysis.

Figure 11: Key findings from RKVY-PDMC highlight the status of policy coherence

Horizontal and vertical institutional coherence
<ul style="list-style-type: none"> Horizontal institutional coherence is established at the formulation, implementation, and monitoring and evaluation stages.
External consistency
<ul style="list-style-type: none"> Policy implementation takes cognisance of external consistency with MGNREGS and ABY. The policy mostly has a medium to high positive impact across One CGIAR thematic areas. The two key thematic areas of climate change adaptation and mitigation and poverty reduction, jobs, and livelihoods have the highest external consistency with RKVY-PDMC.
Scope for convergence
<ul style="list-style-type: none"> The guidelines do not explicitly mention the nature of convergence.
Flexibility and adaptability
<ul style="list-style-type: none"> Platforms have been operationalised to enhance flexibility and adaptability. There is a need for further research to understanding their effectiveness, challenges, and opportunities.
Social inclusion
<ul style="list-style-type: none"> The policy prioritises small and marginal farmers as the key beneficiaries of the policy. It achieves inclusion through the representation of gender experts and thematic institutions at the policy formulation stage.

Source: Authors' analysis

4.4. Mission for Integrated Development of Horticulture

The following sections outline the analysis for MIDH across vertical and horizontal institutional coherence, external consistency, scope for convergence, flexibility and adaptability and social inclusion. It also highlights the key findings for the policy.

4.4.1 Vertical and horizontal institutional coherence

At the national level, the mission is led by a General Council (GC), which formulates and provides overall direction and guidance, monitors and reviews progress and performance, and lays down and amends operational guidelines. For policy implementation, an Executive Committee (EC) oversees the activities of the mission and approves the action plans of state horticulture missions (SHMs) and national-level agencies (NLAs). Further, technical support groups (TSGs), composed of personnel at different levels, provide technical services. Policy impact evaluation is a feature of MIDH that invites external institutions and private bodies to conduct detailed impact evaluations for the mission at the national level (Global AgriSystem 2020; Institute for Social and Economic Change (ISEC) 2017).



For implementation, state-level executive committee(s) (SLECs) are created under the leadership of the representatives of the ministries of horticulture, agriculture, and environment and forests. The committee also prepares state annual action plans. The SLEC is also responsible for carrying out M&E, after which it furnishes details of progress every month. At the district level, the district mission committee (DMC) is involved in furthering the objectives of the mission for project formulation, implementation, and monitoring. Local bodies like the PRIs are also envisioned as part of the implementation stage; they are responsible for carrying out local crop assessments and training and awareness activities of gram sabha officials. The communities are largely seen as the beneficiaries of the mission activities (Table A3 and A5) (Government of India 2023c).

4.4.2. External consistency

The literature on MIDH identifies direct linkages with other policies, including the MGNREGS. The MIDH can conduct area expansion in conjunction with MGNREGS, which can meet the costs of labour such as digging and fencing. Additionally, MIDH is consistent with policies like the National Mission for Sustainable Agriculture (NMSA) and RKVY, which are beyond the scope of our study (Shivalingaiah, Ganesamoorthi, and Arundhati 2022). MIDH works closely with the NMSA towards micro-irrigation for all horticulture crops and protected cultivation on farmers' fields. It also provides technical advice and support to states and state horticulture missions (SHMs) for the Saffron Mission and other horticulture-related activities, such as the Vegetable Initiative for Urban Clusters (VIUC), funded by RKVY/NMSA. Other policies, such as the PM Kisan SAMPADA Yojana, Krishi UDAN, Kisan Rain, PMSSY, Sub-mission on Agricultural Mechanisation, and others also find consistencies with the MIDH.

The study uses responses from stakeholders to identify linkages with various SDG impact areas. It identified highly positive linkages under the themes of nutrition, health, and food security; poverty reduction, livelihoods, and jobs; and climate change adaptation and mitigation. There were also positive linkages to environmental health and biodiversity and gender equality, youth, and social inclusion (Table A12).

4.4.3. Scope for convergence

The stakeholders identified some convergences inherent to the MIDH system. The links to activities

such as food processing, nutrition education, water conservation (for example, rainwater harvesting), rooftop gardening, and others are important. Stakeholders could also explore convergence by developing integrated dashboards instead of separate ones. Additionally, implementation activities for MIDH could target areas in which the natural and water resource base have already been developed under watershed development programmes, such as the RKVY and MGNREGS. The demand-driven approach of crop production under the MIDH presents an opportunity to align it with the nation's nutritional objectives and the agro-ecological potential of each region, particularly hilly areas. Additionally, there is potential to leverage the produce from MIDH for emergency and disaster response, creating arrangements for utilising these resources during critical times.

4.4.4. Flexibility and adaptability

States are directed to develop and operationalise their own information communication technology (ICT)-enabled management information systems (MIS) even at the grassroots level. Through MIDH's dedicated portal, HORTNET they create a data management information system for M&E at the state level and support decisions on adaptability to uncertain changes. Further, as a policy instrument, the MIDH maintains a cycle of impact assessment by external agencies that use efforts outside the purview of the policy to display the adaptable, reflexive nature of the policy. Finally, experts note that while the guidelines were developed in 2014, there are ongoing discussions to revise them. So, while there is some regular appraisal of the guidelines, the process is yet to be fully streamlined.

4.4.5. Social inclusion

The MIDH guidelines outline succinct processes for social inclusion across geographies and socio-economic strata. Around 30 per cent of the budget outlay is allocated to female farmers, 16.6 per cent to the SC sub-plan, 10 per cent to the northeastern region, and 8.6 per cent to STs. There is an indication to prioritise persons with disabilities requiring tailored assistance during the implementation of the policy (Government of India 2014). Through external donors like the Asian Development Bank (ADB), there is also a focus on

including small and marginal farmers through the creation of new institutions, such as cluster-wide community horticulture production and marketing associations (CHPMAs) (Government of India 2023d). Despite these provisions, experts note that farmers' involvement in policy formulation, planning, monitoring, and evaluation is mostly missing. They consider it essential to involve community bodies or external agencies representing small and marginal or landless farmers as part of the policy formulation process. Further, agricultural extension officers could conduct dietary surveys with farming families to boost the nutrition of vulnerable sections of the population.



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4.4.6. Key findings

Figure 12 highlights the key findings from the analysis.

Figure 12: Key findings from MIDH highlight the status of policy coherence

Horizontal and vertical institutional coherence
<ul style="list-style-type: none">• <i>Policy formulation and implementation is generally carried out through a council with representation from diverse departments concerned with horticulture. This includes agriculture, food processing, commerce, and PRIs at the central level.</i>• <i>Local bodies' involvement is restricted to the implementation phase at the grassroots level. The role of communities is limited to their participation as beneficiaries and as a part of PRIs.</i>
External consistency
<ul style="list-style-type: none">• <i>The essence of the MIDH policy is to converge siloed efforts through different ongoing policies.</i>• <i>Additionally, the policy finds convergence with various other policies, such as the MGNREGS, RKVY, NMSA, PMKSY, Krishi UDAN, Kisan Rain, PMSSY, and the Sub-mission on Agricultural Mechanisation.</i>• <i>The contribution of the policy towards the achievement of the SDG on climate change adaptation and mitigation and environmental health and biodiversity needs to be strengthened based on the positive impact it creates.</i>
Scope for convergence
<ul style="list-style-type: none">• <i>Key areas in which convergence with several policies can be built are food processing, nutrition education, and water conservation practices, such as rainwater harvesting and rooftop gardening.</i>
Flexibility and adaptability
<ul style="list-style-type: none">• <i>A data management information system for M&E is operational at the state level, to support decisions on adaptability.</i>• <i>MIDH maintains a cycle of impact assessments by agencies independent of the policy: impact assessment is conducted by external agencies demonstrating reflexive evaluation.</i>• <i>The policy currently follows 2014 guidelines; revisions of the policy are still under consideration.</i>
Social inclusion
<ul style="list-style-type: none">• <i>MIDH has a specific budget allocation towards particular vulnerable groups, such as female farmers and SC/ST groups, and geographies, such as the northeastern region.</i>• <i>Special efforts were made to support persons with disabilities requiring tailored assistance during the implementation of the mission.</i>• <i>The inclusion of small and marginal farmers has been enabled through the creation of cluster-wide community horticulture production and marketing association.</i>

Source: Authors' analysis

4.5. Pradhan Mantri Matsya Sampada Yojana

The following sections outline the analysis for PMMSY across vertical and horizontal institutional coherence, external consistency, scope for convergence, flexibility and adaptability and social inclusion. It also highlights the key findings for the policy.

4.5.1. Vertical and horizontal institutional coherence

Horizontal institutional coherence exists at multiple governance scales. It is well established at three stages of the policy cycle at the central level. The institutional setup consists of the Central Apex Committee (CAC), which is engaged in steering the formulation, implementation, and monitoring of PMMSY; the Project Monitoring Unit (PMU), which regularly monitors the activities of PMMSY; and a dedicated Project Monitoring and Evaluation Unit (PMEU), which consists of domain experts and monitors and evaluates the implementation of the PMMSY periodically (Government of India 2020a; Government of India 2020b; Government of India 2020c). At the state level, the state-level approval and monitoring committee (SLAMC) is responsible

for the implementation and monitoring of the policy through the preparation of the fisheries annual action plans and the approval of projects and proposals in accordance with the PMMSY operational guidelines. At the union territory level, the union territory level approval and monitoring committees (UTLAMC) are headed by their respective state departments of fisheries. At the state and union territory levels, the state programme units (SPU) and union territory programme units (UTPU) support the SLAMC. At the district level, there are district-level committees (DLC) for the preparation and approval of the annual district fisheries plan and the implementation and monitoring of the PMMSY in accordance with the policy guidelines. A district programme unit (DPU) is created to support the DLC in the implementation. At the community level, fisher self-help groups are engaged in implementation – for instance, to develop the cluster area infrastructures. The state fisheries board nominates CSOs to be engaged as end-implementation agencies. The vertical institutional coherence is evident in the CAC's approval of the state-level plans and the SLAMC's role in the consolidation of all district plans for the implementation of PMMSY (Government of India 2020a) (Table A3 and A6).

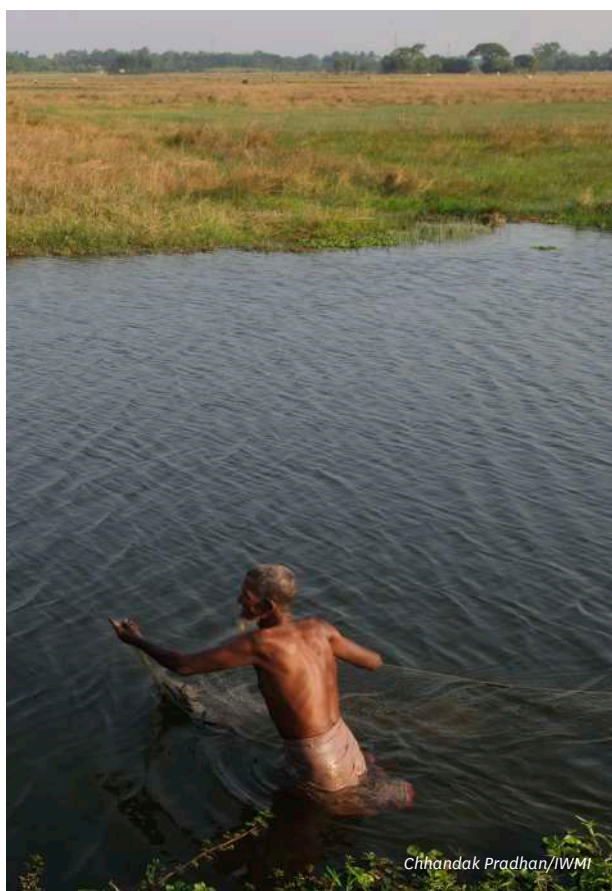
4.5.2. External consistency

PMMSY has external consistency with MGNREGS for the construction of farm ponds and the development of water bodies (Government of India 2020a).

External consistency between PMMSY and MGNREGS

“The Odisha state government asked the department to grant long-term leases on these tanks to women SHGs, who can use them to grow fish. There were many benefits; MGNREGS and other district programmes and funds, such as those of NRLM, leased over 15,000 tanks to women SHGs under the department of women's empowerment (known as the Department of Mission Shakti).” (fisheries expert)

PMMSY also has external consistencies with the Sagarmala Programme of the Ministry of Shipping for fishing harbours/fish landing centres; with the Pradhan Mantri Kisan Sampada Yojana of the



Chhandak Pradhan/IWMI

Ministry of Food Processing Industries for post-harvest processing; and with the Rastriya Krishi Vikas Yojana and Kisan Credit Card of the Ministry of Agriculture and Farmers Welfare for pond construction and to meet the working capital requirement of fish farmers for production-related activities. There are also external consistencies with the National Rural Livelihoods Mission for the creation of fisheries infrastructure and with the Fish Farmers Producer Organisations/Companies (FFPOs/C) for the economic empowerment of the fishing communities.

Although the objectives of PMMSY have a clear linkage to the improvement of nutrition, health, and food security, the stakeholder consultation indicates that it has had no positive impact as yet. Under the poverty reduction, livelihoods, and jobs theme, it is observed that highly positive linkages are with SDG 5a, while medium positive linkages with SDGs 1.1 and 10.2. Under the climate change adaptation and mitigation thematic area, the findings suggest a highly positive linkage with SDG 2.4. Under the environmental health and biodiversity area, a highly positive linkage with SDGs 6.6 and 14.2. are observed. Under the thematic area of gender equality, youth, and social inclusion – which relates to SDG 10.2 on the social, economic, and political inclusion of all the findings indicate a positive linkage (Table A13).

4.5.3. Scope for convergence

Fisheries are considered a state subject as per the Constitution of India. Therefore, stakeholder consultations suggest that the convergence of PMMSY with other policies needs to be visualised at the state level. There are enabling mechanisms for inter-departmental coherence at the state level. The flexibility in the PMMSY has led to innovative activities that go beyond the mandates of the policy²². To enhance the convergence of efforts, PMMSY has already established institutional awareness. There is scope for future convergence with other policies on water pollution resulting from the release of chemicals and effluents from fish tanks into seas or rivers. Stakeholder consultation revealed that in Andhra Pradesh, effluents from intensive aquaculture are damaging water resources. Other issues on which there is scope for future convergence are food and nutritional security and sustainable value chains.

4.5.4. Flexibility and adaptability

There is a need to make the policy flexible and sensitive to other developmental aims. For instance, the stakeholder consultations revealed that there is a need for a system like a public aggregator on the lines of the Food Corporation of India that can procure fish, provide cold storage, and establish a price discovery facility. This is to internalise the unpredictable markets or sudden weather anomalies and avoid the fish wastage and destruction resulting from these changes.

The policy has multiple components, and due to its existing flexibility, there is a need to expand some of its more promising aspects. These include seaweed cultivation research to explore the ‘allied activities’ in coastal areas that are beneficial to the environment. Within the scope of the food-land-water nexus, there is a need to understand the sustainability of the fish feed, as aquaculture consumes large resources to grow fish. The policy’s flexibility is also reflected in its enhancement of external consistency by converging with other policies, such as PM Awas Yojana, for the creation of housing for the fisherfolk.

4.5.5. Social inclusion

Whenever activities planned under PMMSY are oriented directly towards the beneficiary, such as individuals or groups. 60 per cent of the central assistance is provided to vulnerable social groups recognised as Scheduled Castes (SC), Scheduled Tribes (ST), and women, considering the persisting gender inequality that translates into nutritional and economic inequality. There is 40 per cent central assistance for the social group classified as the general category. Under the PMMSY, small and marginal fisherfolk with less than two hectares area are prioritised as beneficiaries (Government of India 2020c).

One of the challenges in social inclusion is the removal of fisherfolk from naval infrastructure and large ports. This sudden change in land use adds to the uncertainties faced by the artisanal fisherfolk. Stakeholder consultations reflect a possible avenue for overcoming such challenges: provisions to include local social groups of artisanal fisherfolk in the transition. This would provide them with a timeframe within which to continue their livelihood practices in the transition period.

²² For example, in Meghalaya, a state-led demand sanctioned policy funds to construct a fish sanctuary. The creation of Amrit Sarovar across states in 2022 was undertaken using PMMSY policy funds for the inclusion of fishing as an activity in the Sarovar.

4.5.6. Key findings

Figure 13 highlights the key findings from the analysis.

Figure 13: Key findings from PMMSY highlight the status of policy coherence

Horizontal and vertical institutional coherence
<ul style="list-style-type: none"> • <i>The role of local bodies, communities, and CSOs is limited to implementation. Their inclusion in the project planning under PMMSY would lead to successful outcomes and build ownership of interventions beyond the duration of the policy.</i> • <i>The policy has a well developed system to monitor and evaluate the activities undertaken in PMMSY.</i>
External consistency
<ul style="list-style-type: none"> • <i>There are external consistencies between PMMSY and MGNREGS for the development of infrastructure to support fisheries and rural life.</i> • <i>The high positive impact of PMMSY on poverty reduction, livelihoods, and jobs is evident. This reinforces the external consistencies between PMMSY and MGNREGS.</i> • <i>The objectives of PMMSY have a significantly large potential for contributing to SDGs on nutrition, health, and food security; however, the impacts are not yet evident.</i>
Scope for convergence
<ul style="list-style-type: none"> • <i>There is a need to envision convergence at the state level, as fisheries is a state subject.</i> • <i>There is scope for enhancing inter-departmental coordination at the state level.</i> • <i>Points on which convergence is needed are water pollution, food and nutritional security, and sustainable value chains.</i>
Flexibility and adaptability
<ul style="list-style-type: none"> • <i>There is scope for enhancing flexibility in convergence with other policies on food-land-water systems.</i> • <i>A system like a public aggregator on the lines of the Food Corporation of India is an example of internalising the unpredictable markets or sudden weather anomalies and avoid wastage.</i>
Social inclusion
<ul style="list-style-type: none"> • <i>Scheduled Castes, Scheduled Tribes, and women as the specific vulnerable groups who are identified as the beneficiaries of the policy.</i>

Source: Authors' analysis

4.6. Pradhan Mantri Krishi Sinchayee Yojana: Watershed Development Component

The following sections outline the analysis for WDC – PMKSY 2.0 across vertical and horizontal institutional coherence, external consistency, scope for convergence, flexibility and adaptability and social inclusion. It also highlights the key findings for the policy.

4.6.1. Vertical and horizontal institutional coherence

At the central level, the National Steering Committee (NSC) acts as a coordinator for the policy as a whole; it is specifically responsible for the appraisal of new projects and the overall management of projects under the policy (Government of India 2021c). NRAA is the knowledge partner for the policy. The Watershed Management Division of DoLR acts as the national-level nodal agency (NLNA) and is engaged in the formulation, implementation, and M&E stages of the policy cycle for the supervision and guidance of participatory watershed development projects (Government of India 2021c). At the state level, the state-level sanctioning committee (SLSC) oversees project and budget approvals supported by the state-level nodal agency (SLNA). The SLNA is responsible for the successful implementation of the programme and also selects the Project Implementation Agencies (PIAs). To evaluate the impact of the projects, the state empanels independent evaluating agencies to carry out assessments at the mid-term and end-term marks (Government of India 2021c). At the district level, a watershed cell cum data centre (WCDC) is responsible for monitoring implementation. Additionally, the WCDC also enables vertical integration and is responsible for establishing close coordination with the sub-district administration and local bodies (Government of India 2021c). The PIA also set up a Watershed Development Committee (WDC) – the technical team at the project level – that works closely with watershed committees (WC) at the community level (Government of India 2021c). The zila parishad (ZP) and the district planning committee (DPC), two other important institutions at the district level, are responsible for convergence with other district-level plans (Government of India 2021c). CSOs²³ also have an active role at various stages

and levels of policy implementation. Voluntary organisations (VOs) and developments can be part of the PIAs (Table A3 and A7).

4.6.2. External consistency

Some important policies that fit together with the WDC component are the ‘per drop more crop’ aspects of the PMKSY and MGNREGS. District irrigation plans (DIPs) developed for the PDMC component of the PMKSY could be synchronised with the Participatory Watershed Development Programme (PWDP) developed by the WDC-PMKSY 2.0. MGNREGA presents opportunities to coordinate watershed development work, which is its major focus and the primary focus of WDC-PMKSY 2.0. Although these are beyond the scope of the study, the findings indicate that WDC also has external consistency with the National Food Security Mission (NFSM), Integrated Farming System (IFS), Horticulture programmes, NRLM, Gram Panchayat Development Plan, and Compensatory Afforestation Fund Management and Planning Authority (CAMPA).

Experts highlight how the WDC policy links to the SDGs. The impact on nutrition, health, and food security is expected to be neutral. In the area of poverty reduction, livelihoods, and jobs, the WDC policy is expected to have a medium positive impact, while for climate change mitigation and adaptation, the policy is expected to have a high positive impact. Further, the WDC policy is expected to have a medium positive impact on SDGs related to environmental health and biodiversity. Finally, the policy is also anticipated to have positive and substantial effects on gender equality, youth, and social inclusion-related SDGs (Table A14).



²³ Technical and professional advisory may be sought from scientists and academicians from Krishi Vigyan Kendras and state/central agricultural Universities (Government of India 2021c). National-level institutions like NIRD&PR, MANAGE, CAZRI, IIWSC, CRIDA, IRMA, IIFM, WTCs, and NRSC also support capacity-building for the WDC-PMKSY 2.0 policy (Government of India 2021c).

4.6.3. Scope for convergence

The WDC encourages the elements of coherence and convergence. The guidelines mention that convergence should be explored for the coordinated use of resources for common objectives, which could enable cooperation and synergy in government and non-government programmes. It also urges states/UTs to map activities from other sectors within the scope of the WDC to enhance convergence. This would be crucial to effectively integrate relevant central and state policies for comprehensive development.

4.6.4. Flexibility and adaptability

The WDC has the flexibility to go beyond the norms to build convergence. The WDC-PMKSY 2.0 guidelines refer to the use of advanced scientific tools – such as geographic information systems, remote sensing, and management information systems (MIS) – for the efficient planning, monitoring, and evaluation of projects. These enable the integration of various scientific processes and facilitate real-time tracking of progress, process efficiency, and quality. There is an explicit recognition of flexibility and adaptability in the guidelines within the mechanism for regular appraisal of the policy. They state that for a successful development strategy, both the planning and implementation stages require adaptability and flexibility. This can be achieved by integrating the two through a continuous cycle of “Implementation-Learning-Design Change” (Government of India 2021c). The stakeholder consultations reflected that the WDC guidelines have undergone revisions approximately eight or nine times over the past two decades. These revisions occur periodically – typically every two to three years – without a specific timeline. They should be carefully managed to avoid imposing extensive changes on the institutional settings. While periodic updates are beneficial, it is important to ensure that the duration of projects remains at least five years long so that there can be some meaningful change on the ground.

4.6.5. Social inclusion

WDC-PMKSY 2.0 recognises resource-poor, assetless, and differently abled people and women as vulnerable sections. The guidelines contain mechanisms for their inclusion. The policy also focuses on enhancing their access to income-generating opportunities and facilitating their participation in community institutions, such

as FPOs and user groups. At the village level, the WC has at least two representations each from the women and SC/ST farmers. The policy mandates that the chairperson or co-chairperson of the WC be a woman. The landless and assetless farmers are beneficiaries of alternate livelihood options. There are also clear guidelines for the allocation of funds to vulnerable groups. For instance, in National Resource Management (NRM) works executed on private lands, the contribution to the Watershed Development Fund (WDF) may be 10 per cent of the cost. However, for SC/ST, small, and marginal farmers, the contribution may be reduced to five per cent of the cost of NRM works. Similarly, for individual profit-generating activities, while the contribution of a farmer beneficiary will be 20 per cent of the total cost estimate, the contribution from SC/ST farmers is 10 per cent (Government of India 2021c). From the stakeholder consultations it emerged that there is also a need for equitable distribution of the benefits.

Ensuring equitable distribution of benefits

“In Rajasthan, the WDC-PMKSY 2.0 programme employs a mechanism that prevents one farmer from receiving an excessive amount of benefits. It achieves this by linking the programme to the Jan Aadhar Yojana of the State Government” (Technical expert on irrigation and watershed).



Hamish John Appleby/IWMI

4.6.6. Key findings

Figure 14 highlights the key findings from the analysis.

Figure 14: Key findings from WDC-PMKSY 2.0 highlight the status of policy coherence

Horizontal and vertical institutional coherence
<ul style="list-style-type: none">• <i>Specific mechanisms are in place to enable vertical and horizontal institutional coherence for the formulation, implementation, monitoring and evaluation, and impact evaluation of the policy.</i>• <i>Relevant line ministries and departments are part of almost every agency constituted at various levels from the centre to the sub-district level to encourage horizontal coherence.</i>• <i>CSOs are engaged at multiple governance levels to build vertical institutional coherence,.</i>
External consistency
<ul style="list-style-type: none">• <i>Policies which have common objectives with WDC-PMKSY are encouraged to work in harmony.</i>• <i>The external consistency of WDC-PMKSY with MGNREGS is established.</i>• <i>The policy has relatively high and medium positive impacts on SDGs related to Climate Change Adaptation and Mitigation, and Gender Equality, Youth and Social Inclusion presenting adequate opportunities to add to India's progress in achieving the SDGs.</i>
Scope for convergence
<ul style="list-style-type: none">• <i>There is scope for convergence on integration with horticulture policies, given their potential to support farmers to double their incomes and improve livelihood indicators.</i>• <i>Given the nature of watershed development, convergence should be actively encouraged beyond watershed elements with the inclusion of food, land, and water for sustainable development.</i>• <i>The element of convergence is limited to monitoring and evaluation and impact evaluation in order to enable learnings for new projects and other policies.</i>
Flexibility and adaptability
<ul style="list-style-type: none">• <i>The policy has coherent mechanisms to allow for flexibility and adaptability in the light of future uncertainty.</i>• <i>Periodic reviews are a part of the suggested guidelines. Also, in practice, the guidelines have undergone several revisions to allow for new changes and learnings.</i>• <i>The guidelines also ensure a flexible data management system to support data-driven adaptability to uncertain changes.</i>

Social inclusion

- *The programme ensures the inclusion of vulnerable groups in committees through dedicated representation of women, Scheduled Castes and Scheduled Tribes.*
- *The assetless and landless farmers further benefit from alternate livelihood options.*

Source: Authors' analysis



CIMMYT

4.7. Mahatma Gandhi National Rural Employment Guarantee Scheme

The following sections outline the analysis for MGNREGS across vertical and horizontal institutional coherence, external consistency, scope for convergence, flexibility and adaptability and social inclusion. It also highlights the key findings for the policy.

4.7.1. Vertical and horizontal institutional coherence

MGNREGS exhibits a bottom-up vertical institutional coherence, as the activities are demand-driven from the PRI. MoRD plays a key role in ensuring timely and adequate resource support to states and the Central Employment Guarantee Council (CEGC). The CEGC advises the central government on its implementation activities; reviews the monitoring and redressal mechanism periodically; and recommends improvements. Specialised bodies like the Central Ground Water Board (CGWB) are involved in planning, monitoring, and executing physical structures built under MGNREGS that impact groundwater resources. The e-governance platform, NREGASoft, monitors the outputs of the MGNREGS across states, districts, and three tiers of PRIs (Government of India, 2023e).

State governments are involved in planning and implementing the policy by preparing labour budgets. They set up state-level MGNREGS implementation agencies and missions and MGNREGS social audit agencies/directorates and

operate a State Employment Guarantee Fund. Each state delegates financial and administrative powers to the DPC and the programme officer for effective implementation. The state government also ensures that CSOs involved in mobilising the workers are able to formally meet state, district, and block-level officials in a formal setting at least once a month. It is responsible for the dissemination of findings to multiple stakeholders (Government of India 2021d). The state quality monitoring cell (SQMC) is responsible for monitoring and evaluating the policy.

At the district level, the district programme coordinator (DPC) oversees the implementation stage. The district quality monitoring cell (DQMC) is responsible for monitoring and evaluating the policy's progress and impact at the district level. At the sub-district level, the active participation of wage seekers, gram sabhas, GPs, and programme officers is crucial. The gram sabha prioritises the order of work in the meetings considering the local area and its needs and resources. It monitors the execution of works within the GP (Government of India 2021d). The GP is primarily involved in the implementation and support of the M&E and impact evaluation activities (Government of India 2021d). The grassroots-level CSOs play a significant role in the generation of awareness and capacity-building among GPs and state governments. The role of the SHG is envisioned in particular stages of implementation, such as generating awareness, organising work, granting workers access to their entitlements, providing support in M&E activities (like surveys), and ensuring social accountability (Government of India 2021d) (Table A3 and A8).



4.7.2. External consistency

MGNREGS is an important policy that demonstrates external consistency with the WDC-PMKSY 2.0, which was earlier referred to as the Integrated Watershed Management Programme (IWMP). They are aligned in their efforts and share common objectives related to rural development and natural resource management (NRM). NRM-related works under MGNREGS are undertaken in convergence with the policies. From the perspective of the food, land, and water nexus, 182 of the 262 permissible combinations of works are related to NRM. Around 85 of these focus specifically on water-related activities, and 164 are related to agriculture and allied activities. Although they are beyond the scope of this study, external consistency is identified with Command Area and Water Management, Deendayal Antyodaya Yojna – National Rural Livelihoods Mission (DAY-NRLM), Pradhan Mantri Awaas Yojana – Gramin (PMAY-G), Shyama Prasad Mukherji Rurban Mission (SPMRM), and Pradhan Mantri Gramin Sadak Yojana (PMGSY).

MGNREGS has external consistencies with the SDGs in all five thematic areas of One CGIAR. It has high and medium positive impacts in the thematic areas of nutrition, health, and food security (Government of India 2016).

MGNREGS contributes to SDG 1.1. on eradicating extreme poverty

“ [It acts as] a safety net programme that provides respite and serves as an additional source of income for poor and marginalised rural households” (government policies expert).

In the thematic area of poverty reduction, livelihoods, and jobs, MGNREGS has a high positive impact on SDG 1.1 on eradicating extreme poverty. In the area of climate change adaptation and mitigation, the stakeholders recognise that it has a significant positive impact. Further, it has a medium positive impact on environmental health and biodiversity. In the context of gender equality, youth and social inclusion, MGNREGS has both high and medium positive impacts on related SDGs (Table A15).

4.7.3. Scope for convergence

Specifically in the context of MGNREGS, the themes of poverty reduction, livelihoods, and jobs provide an important avenue for further enhancing convergence. There are emergent themes on which convergence with other policies is possible, with a specific focus on coconut plantations, aquaculture, fodder farms, horticulture, nutri-gardens, and moringa plantations. Extending the scope of MGNREGS to include the resilience of climate change infrastructure and assets promotes long-term, sustainable rural development. The mechanisms to enhance convergence include the DPC, which plays a crucial role in ensuring coordination between the annual action plans of MGNREGA, IWMP, and PMKSY. MGNREGA has opportunities for convergence with other programmes and policies in its 2013 revised guidelines (Nayak, Jenamani, and Sahoo 2017). The current convergences are an outcome of this important development. MoRD has developed and disseminated guidelines for the convergence of MGNREGS with specific policies and programmes. These are MoEFCC, MoWR, and ICAR, and 115 pilot districts across 22 states.

4.7.4. Flexibility and adaptability

MoRD conducts regular review meetings with various stakeholders involved in all stages of the policy cycle, specifically the implementation, monitoring, and evaluation. For transparent and accountable implementation, an MIS is used to obtain necessary data. NREGASoft (Government of India 2021f; Government of India 2023e), the e-governance platform, is important for M&E and provides support when adapting to unforeseen changes.

There is a need for continuous improvement of NREGASoft to ensure that it captures comprehensive and real-time data related to the policy's implementation, progress, and impact. Research conducted by independent agencies provides insights about necessary changes by generating evidence on post-facto evaluation and mid-course correction.

4.7.5. Social inclusion

MGNREGS has provisions for the proactive inclusion and prioritisation of specific vulnerable households and social groups. Households identified as socio-economically disadvantaged according to the Socio-Economic Caste Census (SECC) are prioritised for access to the benefits of the policy.

These specific vulnerable groups are the SCs, STs, nomadic tribes, de-notified tribes, households below the poverty line, women-headed households, households headed by the physically handicapped, and beneficiaries of land reforms. MGNREGS mandates that 33 per cent of these beneficiaries are women (UNDP 2013). There is a provision for 50 days of wage employment in addition to the 100 days available to ST households and those residing in forest areas, with rights to land provided under the Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006. This specific focus on social inclusion emphasises the conscious effort towards empowering and promoting all individuals.

4.7.6. Key findings

Figure 15 highlights the key findings from the analysis.



Figure 15: Key findings from MGNREGS highlight the status of policy coherence

Vertical and horizontal institutional coherence

- *MGNREGS exhibits a bottom-up vertical institutional coherence, as the activities are demand-driven, with the local-level governance body, PRI, playing a role in planning and prioritising activities.*
- *Horizontal institutional coherence occurs at all levels, with a prominence at the sub-district level.*
- *Other than implementation, there is a key focus on monitoring and evaluation and impact evaluation through social audits.*

External consistency

- *MGNREGS is an important policy that demonstrates external consistency with PMKSY-WDC 2.0.*
- *182 of the 262 permissible combinations of works under MGNREGS are under NRM, with 85 on water and 164 on agriculture and allied activities.*
- *The findings indicate high and medium positive impacts of MGNREGS on the SDGs in the thematic areas of poverty reduction, livelihoods and jobs, climate change adaptation and mitigation; and gender equality, youth and social inclusion.*

Scope for convergence

- *The themes of poverty reduction, livelihoods, and jobs provide an important avenue for further enhancing convergence.*
- *The emerging themes where convergence can be further strengthened are natural resources management and water security, sustainable agriculture, agroecology, and resilience to climate change for long-term sustainable rural development.*
- *The enabling mechanisms for enhancing convergence are the committees for the coordination and dissemination of guidelines, progress to other departments, and multiple stakeholders.*

Flexibility and adaptability

- *MGNREGS conducts regular review meetings with the various stakeholders involved in all stages of the policy cycle.*
- *NREGASoft, the e-governance platform, is important for monitoring and evaluation, and provides support for decisions on adapting to unforeseen changes.*
- *Independent and commissioned research generates evidence on post-facto evaluation and mid-course correction to make space for adaptability.*

Social inclusion

- *MGNREGS mandates proactive inclusion and the prioritisation of vulnerable households.*
- *It covers a broad spectrum of the vulnerable sections, such as social groups that face historical disadvantages; households below the poverty line, headed by women, or persons with physical disability requiring tailored assistance; and groups that face adversities due to land reforms.*
- *The policy gives additional benefits to Scheduled Tribes and Other Traditional Forest Dwellers.*

Source: Authors' analysis

4.8. National Mission for Clean Ganga Namami Gange Programme

The following sections outline the analysis for NMCG – NGP across vertical and horizontal institutional coherence, external consistency, scope for convergence, flexibility and adaptability and social inclusion. It also highlights the key findings for the policy.

4.8.1. Vertical and horizontal institutional coherence

There is an institutional setup to build horizontal institutional coherence at the central, state, and district levels under the NMCG-NGP. It has representation from all relevant sectors at three stages of the policy cycle, i.e., from policy formulation to implementation and M&E. These include the National Ganga Council and Empowered Task Force. The key roles of the National Ganga Council are the “protection, prevention, control, and abatement of environmental pollution in River Ganga... its rejuvenation to its natural and pristine condition... to ensure continuous adequate flow of water in the River Ganga” (Government of India 2022e). The Empowered Task Force is involved in the coordination of and advising on the rejuvenation, protection, and management of the Ganga and its tributaries (Government of India 2022e). Additionally, entities like the Central Pollution Control Board (CPCB), Central Water Commission (CWC), Ganga Task Force, and Ganga Knowledge Centre are responsible for M&E activities (Government of India 2022e). Quality Control of India (QCI), an autonomous body under the Ministry of Commerce and Industry, develops a dynamic dashboard for the continuous monitoring of water bodies by the NMCG. A similar setup exists at the state level, with the state project management groups (SPMGs) coordinating and implementing the State Mission for Clean Ganga. At the M&E stages, state pollution control boards (SPCB) functions as Ganga monitoring centres and state Ganga committees are instituted for all the M&E activities concerning the NMCG-NGP.

The important institutions at the district level, the district Ganga committees, are involved in the planning and implementation of the Ganga Rejuvenation Programme. The programme addresses the M&E at the district level with the institutionalisation of a dedicated Ganga district performance monitoring system (GDPMS). They

create space for the active involvement of CSOs, mainly in the implementation of the NMCG-NGP. This is through the district Ganga committee, which includes representatives from the local authority and environmentalists. The guidelines explicitly recognise the involvement of non-governmental organisations (NGOs), self-help groups (SHGs), and educational institutions, such as the Indian Institute of Management, Indian Institute of Technology, and Indian National Trust for Art and Culture Heritage. Vertical institutional coherence is reflected in the State Ganga Committee’s “direction and control over” the district Ganga committee (Government of India 2019b). The decisions of the state Ganga committee are binding upon the district Ganga committee and local authority (Government of India, 2020d). The urban local bodies (ULB) consult with the SPMG and other executing agencies through meetings. This reflects vertical institutional coherence between the state, district, and local body levels. Public outreach activities under NMCG-NGP are conducted through community engagement activities, such as the Ganga Utsav (Ganga Festival) and Ganga Quest. Volunteers are engaged as Ganga Mitra (Friends of Ganga), Ganga Doot (Messengers of Ganga), and Ganga Prahari (Guardians of Ganga) (Table A3 and A9).



Metro Media/IWMI

4.8.2. External consistency

The programme acknowledges the importance of cross-sectoral integration between the line departments relevant to food, land, and water. It makes particular reference to agriculture, water, environment, forest, and climate change. The programme goes beyond these to establish the linkages to power, energy, and livelihoods like tourism and the health sector, which is dependent on medicinal plants for Ayurveda, yoga and naturopathy, Unani, Siddha, and Homeopathy (AYUSH). Since the first meeting of the National Ganga Council, there has been an explicit focus on the convergence of the NGP with other relevant policies on the theme of “augmenting the Ganga conservation efforts, with the development of the local economy” (Government of India 2020d).

With regard to these thematic foci, our analysis suggests that NMCG-NGP has the potential to strengthen its convergence with MGNREGS, MIDH, and ABY. The aspects of the FLW nexus that can be strengthened are sewage treatment infrastructure and reuse; restoration and construction of water bodies; and zero-budget natural farming to generate livelihoods through the Arth Ganga model. The NMCG-NGP also has consistency with the Jal Jeevan Mission; Jal Shakti Abhiyaan; the national flagship urban missions, Atal Mission for Rejuvenation and Urban Transformation (AMRUT), Smart Cities, Swachh Bharat Mission (SBM), National Heritage City Development and Augmentation Yojana (HRIDAY), National Urban Livelihoods Mission (NULM) and the Pilgrimage Rejuvenation and Spiritual Augmentation Drive (PRASHAD).

There are external consistencies of NMCG-NGP with the SDGs in all five thematic areas of OneCGIAR. They have highly positive, medium positive, and neutral impacts in the thematic area of nutrition, health, and food security (Table A16).

There is a gap in advancing the economic empowerment of women through equal access, ownership, and control over resources (referring to SDG 5a) because “actual workers are not in the centre stage and do not participate in [discussions] or express concerns [on] utilising the water.”

In the thematic area of poverty reduction, livelihoods, and jobs, there is a medium positive impact on SDG 1.1 and SDG 1.2. On climate change adaptation and mitigation, NMCG-NGP has a medium positive impact on SDGs 2.4, 15.1, 15.2, and 15.3. On environmental health and biodiversity, it has a highly positive impact on SDG 2.5, a medium positive impact on SDG 6.3, and a neutral impact on SDG 6.6. In the thematic area of gender equality, youth, and social inclusion, it has a highly positive impact on SDG 6.2 and a medium positive impact on SDGs 2.3, 5b, 10.2, and 10.3.

4.8.3. Scope for convergence

The existing institutional coherence and external consistencies can be further enhanced to address various aspects of the Ganga rejuvenation. Mechanisms that can enable convergence up to the urban and rural local body (GP) levels are institutionalised. However, there is a need for further analysis and consultation regarding how these mechanisms would function to integrate the food-land-water nexus. Overcoming the challenges to convergence requires the development of a holistic set of indicators on food, land, and water, drawing on the existing set of indicators and datasets. There is also a need for improved data sharing between the nodal agencies responsible for the policies on which convergence is taking place.



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4.8.4. Flexibility and adaptability

A centralised, data-driven system for real-time monitoring provides institutions with the flexibility to intervene in the case of unexpected changes. The system collects information on sewage infrastructure, riverfront development, river surface cleaning, afforestation, and biodiversity, which are essential components of the food, land, and water interactions (Government of India 2022e). The Ganga Knowledge Centre is considered a model intervention for centralised knowledge integration; it is replicable in other Indian river systems (Government of India 2022e). The flexibility of the programme is limited to knowledge production on water quality and biodiversity conservation. The socio-economic concerns of the people and their uncertainties require policy attention to enhance the food-land-water nexus.

4.8.5. Social inclusion

The NMCG-NGP considers the economically weaker groups engaged in micro, small, and medium enterprises (MSMEs) to be the vulnerable section. To meet the policy objectives of preventing water pollution – and to address the issue of this vulnerable section's inability to pay for effluent

treatment – the policy financially and technically supports the setting up of a common effluent treatment plant (CETP) for MSMEs, such as tanneries in Uttar Pradesh. This kind of intervention reflects that the policy considers vulnerable sections at the implementation stage.

The challenges to greater inclusion of the vulnerable section are the operation and maintenance (O&M) of the CETP in the long run and the MSMEs' release of effluents in untreated, or partially treated, forms into the river. To address these challenges, the policy attention on ensuring the long-term functionality of the CETPs is crucial. This can be enabled by finding sustainable funding and effective management of their O&M. It is essential to strengthen the monitoring mechanisms to ensure that MSMEs are channeling their effluents through CETPs for complete treatment to maintain and improve the health of the river and viability of the local economy. Further opportunities lie in policy coherence on food, land, and water through the identification of vulnerable social groups – whose lives and livelihoods depend on the river – and the inclusion of their concerns and issues.

4.8.6. Key findings

Figure 16 highlights the key findings from the analysis.

Figure 16: Key findings from NMCG-NGP highlight the status of policy coherence

Horizontal and vertical institutional coherence
<ul style="list-style-type: none"> • <i>There is a well-established horizontal institutional coherence, except at the impact evaluation stage of the policy. Capacity-building and need-based assessment with the concerned authority after impact evaluation would be pivotal.</i> • <i>There is multidisciplinary representation in the institutional setup, which is an advancement towards a holistic approach. This needs to be further strengthened through an interdisciplinary approach.</i> • <i>While the policy establishes top-down vertical institutional coherence with the flow of information from centre to state to district, a bottom-up vertical institutional coherence needs to be strengthened for the bidirectional flow of knowledge.</i> • <i>The institutional setup has representation from all the relevant sectors at three stages of the policy cycle, i.e., from policy formulation to implementation to monitoring and evaluation. However, the inclusion of multiple stakeholders in NMCG-NGP is largely limited to the implementation stage.</i>
External consistency
<ul style="list-style-type: none"> • <i>There is external consistency between NMCG-NGP and MGNREGS, MIDH, and ABY. They have the potential to be strengthened.</i> • <i>These external consistencies are premised on themes of local economy, resource use efficiency, biodiversity conservation, public awareness, and multi-sectoral coordination.</i> • <i>External consistency with the SDG on One CGIAR areas of environmental health and biodiversity and gender equality, youth, and social inclusion would act as crucial bridges.</i>
Scope for convergence
<ul style="list-style-type: none"> • <i>The functionality of the enabling mechanisms for convergence on food, land, and water needs policy attention.</i> • <i>Integrated data management and monitoring as a point of convergence would be essential for building policy coherence on food, land, and water.</i>
Flexibility and adaptability
<ul style="list-style-type: none"> • <i>The flexibility of the programme beyond a knowledge centre would be crucial when addressing the social and economic changes.</i>
Social inclusion
<ul style="list-style-type: none"> • <i>The policy supports vulnerable groups through CETPs for MSMEs which engages Economically Weaker Sections.</i>

Source: Authors' analysis

4.9. Atal Bhujal Yojana

The following sections outline the analysis for ABY across vertical and horizontal institutional coherence, external consistency, scope for convergence, flexibility and adaptability and social inclusion. It also highlights the key findings for the policy.

4.9.1. Vertical and horizontal institutional coherence

The guidelines for ABY have set up processes and pathways to integrate various departments, ministries, and local bodies both horizontally and vertically. They also outline opportunities for CSOs and communities to actively participate in the policy. At the national level, a National-Level Steering Committee (NLSC) formed by the nodal department, Department of Water Resources, River Development and Ganga Rejuvenation (DoWR, RD&GR) under the MoJS, is responsible for the overall administration of the policy. The NLSC works closely with a national program management unit (NPMU) to approve and review the programme implementation guidelines, manuals, and implementation status. Further, the NPMU, with the necessary infrastructure to oversee implementation, manages day-to-day activities, handles the administration of funds allocated to the ABY, and regularly monitors and evaluates the implementation of the policy.

For M&E, the NPMU is supported by a third party government verification agency (TPGVA). The data collected is stored in an MIS and measured against disbursement linked indicators (DLIs) (Government of India 2023f). The DoWR engages the QCI for independent verification of these DLIs (QCI 2022). At the state level, while the nodal department is responsible for groundwater, a nodal agency called the programme implementation agency (PIA) is identified for implementation (Government of India 2023f). Further, a state-level steering committee (SLSC) is constituted along the lines of the NLSC with members from state-level line ministries and departments. The SLSC coordinates various departments and oversees convergence. It also guides implementation and carries out financial management (Government of India 2023f). The PIA is responsible for establishing a state programme management unit (SPMU), consolidating district action and financial plans, assisting the TPGVA, and ensuring that programme guidelines are implemented (Government of India 2023f).

At the district level, a district program management unit (DPMU) supports the state and the GPs in planning and implementing project activities. District implementation partners (DIPs) engaged by the PIA work with the DPMUs to hand-hold the GPs. The DPMU also helps synergise with the activities of other policies, especially the Jal Jeevan Mission (Government of India 2023f). Local bodies like GPs play a critical role as the link between the community and administration. GPs are required to strengthen the water management committees/village water and sanitation committees, which form the water user association (WUA). Communities are active participants in the ABY. Apart from being involved through the WUAs and other village-level water committees, local volunteers, called bhujal jaankars and bhujal pracharaks, are required to collect data for groundwater levels, rainfall, and water quality in their areas and disseminate this information (Government of India 2023f). ABY also aims to enhance community mobilisation, the generation of awareness, social inclusion, and people's participation through the involvement of NGOs/CSOs. State institutes of rural development (SIRD) and state institutes for agriculture management (SIMA) play a crucial role in capacity-building support. The Rajiv Gandhi National Ground Water Training and Research Institute (RGNGWTRI) collaborates with the NPMU to conduct national-level training and capacity-building activities (Table A3 and A10).



4.9.2. External consistency

The ABY programme has an explicit expectation of convergence. Its guidelines outline that groundwater resource management in water-stressed areas require the convergence of various ongoing and new central and state policies. MGNREGS can contribute to the ABY by coordinating watershed and groundwater development works to ensure synergy and enhance the overall impact of both initiatives. By integrating MGNREGS works with the objectives of ABY, both policies can work together to achieve sustainable water management and improve livelihoods in rural areas. Micro-irrigation (MI) using the 'per drop more crop' principle promotes water-saving and enhances water-use efficiency in irrigation, thereby aligning with the ABY's objectives of promoting groundwater management and sustainable water use in agriculture. The joint efforts of these initiatives could contribute to the overall goal of achieving long-term water security and agricultural water sustainability in the targeted areas. Some elements of convergence exists with other policies and practices which are not covered in the scope of this study. These are the Jal Jeevan Mission, Swachh Bharat Mission, and the RKVY which could also be explored.

Experts highlight how the ABY policy links to the SDGs. The impact on nutrition, health, and food security is expected to be highly positive. In the area of poverty reduction, livelihoods, and jobs, the ABY is also expected to have a medium positive impact. In terms of climate change mitigation and adaptation, the policy is expected to have a high

positive impact after the marked line. It is likely to have a high positive impact on SDGs related to environmental health and biodiversity. ABY is also expected to have substantial and positive effects on SDGs related to gender equality, youth, and social inclusion (Table A17).

4.9.3. Scope for convergence

The DLI reporting mechanism and institutionalisation can further be expanded to incorporate a comprehensive and long-term impact assessment on various indicators related to food, land, and water, leading to more effective and sustainable outcomes in their management. This expansion could further strengthen the ongoing convergence efforts of multiple agencies involved at different stages of the ABY policy to enable robust learning. Further, the shift from monitoring short-term progress to conducting rigorous long-term impact assessments on the policy's outcomes could improve the effectiveness of interventions and their sustainability over time.

4.9.4. Flexibility and adaptability

Monitoring and evaluation (M&E) involves continuous data collection to assess the progress and transparency of the policy. The M&E framework is developed and implemented at the central level in consultation with the state-level bodies using data compiled from the local bodies at the block, district, line department, and state level. It is then integrated into the MIS and dashboard for performance analysis. In order to ensure independent assessment, the Government of India emphasises impact evaluation through third-party



verification. The World Bank shares the verification protocol, and based on the report provided by the Quality Council of India (QCI), disburses funds. The ABY guidelines provide the framework, policies, and procedures for effective implementation of the policy. The stakeholders acknowledge the learning from programme implementation and periodically revise them to incorporate new insights. The guidelines are referred to as a 'living document', to be revised and regularly appraised as needed, in order to serve as a reference for implementing agencies at the national, state, district, and GP levels. The current version, 1.2, incorporates key changes in programme design and implementation.

4.9.5. Social inclusion

ABY prioritises equitable access and inclusivity of vulnerable groups, including SCs, STs, women (especially single women and female-headed households), minorities, small and medium farmers, and landless individuals. The planning process involves the active participation of women and vulnerable groups through their representation in committees and attendance at meetings. To ensure women's participation, the ABY mandates that at least 33 per cent of members of the groundwater users associations at the GP level are women. Community-based institutions, such as water user groups, are encouraged to adopt participatory and inclusive methodologies for management, planning, and implementation. The programme provides special support to socially vulnerable groups, particularly small and marginal farmers, through the establishment of water sharing mechanisms that prioritise their access to limited resources. It facilitates women's participation through awareness campaigns and collaboration with anganwadi kendras. Gender and social experts are involved in implementing and



evaluating the process. Overall, the policy aims to empower and include vulnerable groups by ensuring that they are actively involved in decision-making and benefit from the programme's initiatives. However, special attention is necessary in areas where women's participation needs to overcome existing historical and social norms.

4.9.6. Key findings

Figure 17 highlights the key findings from the analysis.

Figure 17: Key findings from ABY highlight the status of policy coherence

Horizontal and vertical institutional coherence
<ul style="list-style-type: none"> • <i>ABY has mechanisms in place for inter-ministerial and inter-departmental institutional coherence at all stages of the governance.</i> • <i>The CGWB plays an important role in maintaining central and state coordination, especially on technical matters.</i> • <i>A mechanism for coherence exists at all stages except for the impact evaluation stage.</i>
External consistency
<ul style="list-style-type: none"> • <i>ABY has external consistency with MGNREGS, and RKVY-PDMC.</i> • <i>The guidelines explicitly highlight the potential to strengthen external consistency, and to leverage on these consistencies, there is a provision to incentivise GPs.</i> • <i>Relatively larger positive impacts of the policy are linked to the SDGs related to Climate Change Adaptation and Mitigation, and Gender Equality, Youth and Social Inclusion presenting adequate opportunities to add to India's progress in achieving the SDGs.</i>
Scope for convergence
<ul style="list-style-type: none"> • <i>There is scope for enhancing convergence by strengthening the DLI reporting mechanism and its institutionalisation to enable long-term impact assessment on various indicators related to food, land, and water.</i>
Flexibility and adaptability
<ul style="list-style-type: none"> • <i>The policy has flexible and adaptable mechanisms in the light of future uncertainty. The guidelines are a 'living document' which is periodically updated to incorporate new insights and provide an implementation framework.</i> • <i>It has a comprehensive monitoring and evaluation system with usage of GIS-based monitoring for real-time analysis. This aids in the decision-making and implementation of the Water Security Plan.</i>
Social inclusion
<ul style="list-style-type: none"> • <i>The policy prioritises women, SCs, STs, and small farmers.</i> • <i>It especially encourages women's participation through their representation in committees, mandatory female membership in water user associations, and awareness campaigns to enable empowerment and inclusion in decision-making.</i> • <i>ABY addresses challenges faced in male-dominated regions through regular meetings and consultations with state bodies alongside involvement of Aanganwadi Kendras to mainstream women's participation.</i>

Source: Authors' analysis

5. Conclusion and Recommendations



Our analysis of the seven policies in the FLW sectors clearly highlights the extent to which they address policy coherence and the gaps that remain in confronting the adverse trade-offs. Although some policies, such as ABY, are at a more advanced level when it comes to ensuring coherence across the policy cycle – i.e., planning, implementation, M&E, and impact assessment – others need to make certain improvements. Following recommendations are proposed to address the gaps identified from the perspective of coherence in the policies on FLW systems.

5.1. Horizontal and vertical institutional coherence

Policy guidelines mostly have well-established horizontal institutional coherence. However, they need to transition from a multidisciplinary focus to an interdisciplinary one. The multidisciplinary representation in the institutional setup is reflected in the multi-departmental composition of implementation units at the central, state, and district levels. There is also an emphasis on including technical knowledge partners like CGWB in ABY and NRAA in the WDC-PMKSY 2.0 and RKVY-PDMC. These indicate positive strides towards institutional coherence. Inter-ministerial and inter-departmental coordination need to be leveraged for an integrated focus on the FLW sectors. Such an interdisciplinary approach with multiple policies that share a common focus would be beneficial.

Mechanisms are needed at all levels to align the initiatives in the FLW sectors. The existing mechanism of the ‘Sectoral Group of Secretaries’ is an important example to align the initiatives in the FLW sectors at the national level. The key concern when a policy is led by a single ministry is the undermining of the policy objectives in the convergence process. For example, scientific methods for watershed developments undertaken through WDC-PMKSY 2.0 are compromised due to its intersection with MGNREGS. This is because the MGNREGS provides unskilled manual work through watershed development projects to provide employment guarantees to the poor. In such cases, the joint leadership of ministries is important to realise the full potential of the interlinkages between the FLW sectors.

Bottom-up vertical institutional coherence needs to be strengthened, considering the existing modalities in specific policies. Top-down vertical institutional coherence is established with the flow of information from centre to state to district. To enable a bidirectional flow of knowledge, building bottom-up vertical institutional coherence is essential. Key lessons on bottom-up modalities can be drawn from ABY, MGNREGS, and RKVY-PDMC, which envision them. The works under MGNREGS are driven by demand at the local level of governance; RKVY-PDMC demonstrates a participatory approach to enable community-driven projects; and ABY incorporates community-led demand-driven water security plans.



...building bottom-up vertical institutional coherence is essential. Key lessons on bottom-up modalities can be drawn from ABY, MGNREGS, and RKVY-PDMC, which envision them.

The impact evaluations of the policies need to be outcome-oriented, rather than output-based.

Institutional coherence is well defined at the stages of policy formulation and implementation, less defined in the M&E stage, and non-existent during impact evaluation. These are the stages where outcome-based impact evaluations are needed. This would require the creation of a knowledge base on policy-relevant frameworks for M&E and impact evaluation – for instance, the Har Ghar Jal Programme, which is implemented by the Jal Jeevan Mission to provide safe drinking water. Its progress is measured through SDG 6.1, which focuses on the safe management of drinking water services through output-based indicators (like the number of households provided with a tap connection within the premises) (Government of India 2023g). ABY also reports on outcome-based indicators like “blocks with arrest in the declining trend of groundwater levels” (Government of India 2023f). A similar approach can be incorporated into other policies, where it is currently absent. The theory of change is another important M&E framework that traces the changes created through key interventions (UNDP 2017). It is instrumental in evidence-based programme strategies and enables learning both within and between policy cycles.

There is a need for the explicit recognition of capacity-building in M&E and impact evaluation processes at the state level. States have diverse capacities to monitor and evaluate progress.

However, insufficient capacity has resulted in limited progress in the M&E of the policies. Two important interventions proposed to address this challenge are the capacity-building of the key personnel involved in M&E at the state level and impact evaluation of the policy. There is also a need to shift to joint impact evaluation of the policies where external consistencies exist and convergence is possible. The key personnel involved in the M&E stage should be involved in the joint impact evaluation.

There is a value addition in expanding multi-stakeholder participation to all the stages of the policy cycle to ensure the sustainability of interventions beyond the policy duration. The institutional setup has representation from all the relevant sectors at three stages of the policy cycle – i.e., policy formulation, implementation, and M&E. The inclusion of multiple stakeholders is most comprehensive at the implementation stage. There is value in expanding multiple stakeholder participation to all four stages of the policy cycle, as they bring different capacities to achieving the policy objectives. Specifically, acknowledging the participation of local bodies, communities, and CSOs has the potential to build ownership of interventions beyond the duration of the policy. This can be supported through regular consultations and the establishment of platforms for dialogue to identify the key stakeholders whose participation would be beneficial.



Hamish John Appleby/IWMI

5.2. External consistency

Although some policies, such as MGNREGS and ABY, recognise external consistencies, there is a need to acknowledge other significant external consistencies between policies. MGNREGS clearly features as the pivot for the other six policies. In addition, ABY and RKVY-PDMC have external consistencies with each other. NMCG-NGP has further linkages with MIDH. Further micro-irrigation and finance for its set-up is a common theme in ABY, MIDH and RKVY-PDMC. These external consistencies are addressed by the representation of the departments concerned with food, land, and water in the horizontal and vertical institutional setups created for each policy and in the alignment of the thematic foci of the policies.

Mapping the five priority themes of One CGIAR and the associated SDGs with the policies offers key policy insights. In some cases, comprehensive assessments are needed to determine their impacts on various SDGs.

MGNREGS, RKVY-PDMC, and MIDH have created high positive impacts on relatively more SDGs than the other policies. For detailed recommendations on addressing external consistencies with the One CGIAR themes, see Figures A1–A5.

There is a need for incentivising mechanisms to mitigate the adverse impacts of policies that have conflicting interests based on trade-offs and synergies between sectors. For example, farmers often prioritise crops like sugarcane with higher economic returns even if they require substantial amounts of water for irrigation. This leads to a continued reliance on water-intensive crops, exacerbating the strain on already depleted groundwater sources, which is a focal issue of ABY. The lack of incentives to switch from more water-intensive to less water-intensive crops contributes to the unsustainable use of water resources. Market signals like the minimum support price (MSP), fair and remunerative price (FRP), and Public Distribution System (PDS) could help promote water-saving strategies by acting as incentive mechanisms.

The study suggests a periodic revision of the guidelines, for instance, every two years, considering policy-specific cycles and need for amendments and addendums.

5.3. Scope for convergence

The study recommends regular revisions in policy guidelines for comprehensive convergence. While there is scope for interpreting guidelines, it is crucial that new knowledge on possible convergences informs actions on the ground. A holistic understanding of convergence at the time of revising the guidelines is crucial. The revision to the policy guidelines, amendments, and addendums provide a scope for convergence and are also important reflections of flexibility and adaptability. While amendments and addendums are more frequent the revision of policy guidelines takes place at different intervals. For instance, PMMSY guidelines have undergone two addendums in a gap of one year, followed by an amendment in six months. The guidelines of RKVY-PDMC have undergone revisions at a gap of two to four years. WDC-PMKSY 2.0 has an explicit mention of ‘Implementation-Learning-Design Change’ for successful development of strategy at both planning and implementation stage. Furthermore, ABY policy guidelines also recognises revision ‘from time to time depending on learnings based on the experience of implementation of the program’. Therefore, the study suggests a periodic revision of the guidelines, for instance, every two years, considering policy-specific cycles and need for amendments and addendums. This would help the functioning of existing mechanisms for inter-ministerial and interdepartmental coordination crucial that new knowledge on possible convergences informs actions on the ground. A holistic understanding of convergence at the time of revising the guidelines is crucial. This would help the functioning of existing mechanisms for inter-ministerial and interdepartmental coordination.

The dissemination of guidelines and progress reports to multiple stakeholders needs to be strengthened. The communication channels for disseminating policy guidelines and achievements need to be strengthened by establishing mechanisms and regular checks. This is pivotal for building convergence based on a common and in-depth understanding of the potential of the policies.

The common themes need to be systematically classified for converged efforts. Themes like resource security (food, land, and water), climate resilience, and sustainable development appear as priorities in various policy documents. These themes reflect the diversity of issues that need to

be included in the planning stage for effective implementation and a positive impact. There is need to classify them into a comprehensive list of priorities at the state and national levels through a consultative process with multiple stakeholders.

The state level is the most suitable scale for enabling convergence. This is because water, agriculture, and fisheries are state subjects according to the Constitution of India. The analysis suggests this is an appropriate scale considering the translation of national policies to the state level. These policies concern the issues of the state in the FLW interlinkages and the state-specific policies that reflect these links from the ground up.

The key to enabling convergence lies in integrated data management, monitoring, and impact assessment. Integrated data management on parameters related to food, land, and water is crucial for policy formulation. Best practices showcasing integrated data management in the public domain can be seen in PMMSY. The integration process will be challenging, as the data measurement methods, units, and purposes vary across the concerned departments. These challenges need to be overcome. Further impact assessments over the medium-to-long term through concerted efforts are crucial for shaping the future course of policy actions.

5.4. Flexibility and adaptability

Beyond the M&E stage, there is a need for mechanisms to enhance flexibility and adaptability to uncertainties. Some of these mechanisms already exist and are reflected in the periodic reviews and revisions that have been carried out over the years for the inclusion of new changes and learnings. WDC-PMKSY 2.0 reflect adaptive learning in policy cycle through explicit recognition of the learning and design change. While the periodic updates are beneficial, it is important to ensure that the duration of work and projects remains at least five years long for any meaningful change to be realised on the ground. It is crucial to strike a balance between introducing timely updates and maintaining stability in project implementation. Flexible data management systems support data-driven adaptability. Certain platforms have been operationalised to institutionalise flexibility and adaptability. Concerned bodies have taken major steps in the M&E stage with the use of GIS for real-time analysis

and decision-making. Flexibility and adaptability are concentrated at knowledge centres, which are a part of the M&E stage. The focus should be on making the planning, implementation, and impact evaluation stages more flexible and adaptable to uncertainties. This is critical for the inclusion of the key social and economic changes that are distinct for the state and the sub-state levels in India.

Adequate attention on creating a holistic knowledge base is needed to integrate new knowledge. Stakeholders could realise the full potential of this knowledge base by bringing together datasets on all the relevant parameters of environmental, economic, and social change. This would help them understand uncertainties, such as unpredictable markets or sudden weather anomalies. With this understanding, convergence with other policies would become feasible.

There is a need to prioritise assessing the effectiveness of existing platforms at a sub-national scale. Independent and commissioned research evidence on post-facto evaluation and mid-course correction needs to be collected to make space for adaptability. It is important to consider the state as the scale of assessment so that context-specific lessons on enhancing the effectiveness of the policies are included.

Policies need to enable cross-learning among members of institutionalised committees through best practices on policy coherence in FLW sectors. The policies are at different levels of flexibility and adaptability. Cross-learning among the anchoring ministries is instrumental in capacity-building of the states. In policies requiring flexibility and adaptability, such cross-learning can be beneficial when overcoming bottlenecks.



5.5. Social inclusion

Profiling the impact of FLW policy coherence on vulnerable social groups is crucial for further policy action. Theme-specific profiling is important to identify relevant policy actions. For instance, there is a need to consider vulnerable sections' dependence on the Ganga for food, water, and livelihood security with reference to NMCG-NGP. In the context of PMMSY, it is crucial to establish how social and gender inequalities translate into nutritional and economic inequalities.

Considering the intersectionality of the multiple forms of exclusions that people face, it is pivotal to identify beneficiaries from vulnerable social groups at the scale of local governance. For instance, a landless woman belonging to a Scheduled Caste experiences three layers of exclusions –those of gender, a disadvantaged social group, and a lack of economic resources. These multiple forms of exclusion make certain individuals, and households most vulnerable. In the process of identifying the beneficiaries, these multiple layers are not completely integrated.

Therefore, it is pivotal that the policy guidelines provide flexibility to identify the beneficiaries from the vulnerable social groups at the scale of local governance for advancing social inclusion.

There is a need to include the issues and concerns of vulnerable groups through direct consultation or representation by experts. This should also be scaled up and replicated.

Including the vulnerable in the decision-making process on financial allocation is instrumental to enabling behavioural changes and practices on the ground in terms of food and water security, sustainable livelihoods, and inclusive development. Examples of such processes include farmers' decision to continue with food crops through the use of improved irrigation efficiency instead of switching to non-food cash crops in reference to RKVY-PDMC and the inclusion of fisherfolk in decisions on land-use changes under PMMSY. Their inclusion can be enabled through the creation of awareness and behavioural change. In ABY, gender and social experts are involved at the block and district levels to help mainstream women's participation.



6. Scope of Future Research



There are three key avenues for future research on policy coherence. The first can examine the interplay of state and central policies, taking one state as a case. The state is an important scale for deepening our understanding of policy coherence in FLW systems in India. This would also be an opportunity to unpack interlinkages with other important policies that have not been covered in this study.

Second, research can go beyond consultations with experts to include perspectives from the local level at which the policies are being implemented.

This is crucial to integrate reflections from the ground into an understanding of the effectiveness of the policies, the nature of their impacts, and the efforts that need to be strengthened.

Third, research on implementation in a diverse and unequal context like India can provide important insights with regard to the inclusion of the vulnerable. The national-level study covered these dynamics in FLW sectors only to a limited extent. There is still scope to deepen this understanding with focused thematic research.



Prashanth Vishwanathan/IWMI

7. References

- Acharya, S. S. 2007. National Food Policies Impacting on Food Security: The Experience of a Large Populated Country – India. Helsinki: *UNU World Institute for Development Economics Research (UNU-WIDER)*. https://doi.org/10.1057/9780230589506_1
- Bahinipati, C.S.; Viswanathan, P. K. 2019. Micro-irrigation and Groundwater Use. *India Water Portal*. <https://www.indiawaterportal.org/articles/micro-irrigation-and-groundwater-use>.
- Bassi, N.; Vijayshankar, P. S.; Kumar, D. M. 2008. Wells and Ill-fare: Impacts of Well Failures on Cultivators in Hard Rock Areas of Madhya Pradesh. *IWMI Conference Proceedings 245346*, International Water Management Institute. <https://publications.iwmi.org/PDF/HO41882.pdf>
- Bassi, N. 2014. Assessing Potential of Water Rights and Energy Pricing in Making Groundwater Use for Irrigation Sustainable in India. *Water Policy* 16 (3): 442–453. <https://doi.org/10.2166/wp.2013.123>.
- Bassi, N.; Schmidt, G.; Stefano, L.D. 2020. Water accounting for water management at the river basin scale in India: approaches and gaps. *Water Policy* 22 (5): 768788 <https://doi.org/10.2166/wp.2020.080>
- Bleischwitz, R.; Spataru, C.; VanDeveer, S.D.; Obersteiner, M.; Voet, E.V.D; Johnson, C.; Speed, P.A.; Boersma, T.; Hoff, H.; Vuuren, D. P.V. 2018. Resource Nexus Perspectives Towards the United Nations Sustainable Development Goals. *Nature Sustainability* 1: 737–743. <https://doi.org/10.1038/s41893-018-0173-2>
- CGIAR. 2021. CGIAR 2030 Research and Innovation Strategy: Transforming Food, Land, and Water Systems in a Climate Crisis. CGIAR System Organization. <https://cgspace.cgiar.org/bitstream/handle/10568/110918/OneCGIAR-Strategy.pdf>
- Chopra, D. 2011. Policy Making in India: A Dynamic Process of Statecraft. *Pacific Affairs (Pacific Affairs, University of British Columbia)* 84: 89–107. <https://www.jstor.org/stable/23056062>
- Dellapenna, J.; Gupta, J. 2009. The Evolution of the Law and Politics of Water. *Dordrecht: Springer*. <https://doi.org/10.1007/978-1-4020-9867-3>
- Desai, A. H.; Muralidhar, S. 2000. Public Interest Litigation: Potential and Problems. *International Environmental Law Research Centre*. <https://www.ielrc.org/content/a0003.pdf>
- Dhanagare, D. N. 1987. Green Revolution and Social Inequalities in Rural India. *Economic and Political Weekly* 22 (19/21). <https://www.jstor.org/stable/4377016>
- FAO. 2023. FAOSTAT. Food and Agriculture Organization of the United Nations. <https://www.fao.org/faostat/en/#data/OA>
- Global AgriSystem Private Limited. 2020. Impact Evaluation of National Horticulture Mission (NHM) and Horticulture Mission for North East (HMNEH). <https://midh.gov.in/PDF/Impact%20Evaluation%20of%20NHM-HMNEH%20February%202020.pdf>
- Government of India. 2012. Division-wise Information: Mahatma Gandhi National Rural Employment Guarantee Act (Mahatma Gandhi NREGA). https://rural.nic.in/sites/default/files/o2%20_CIC_PartII_MG_NREGA%28F%29_o.pdf
- Government of India. 2014. MIDH Operational Guidelines. Horticulture Division, Department of Agriculture and Cooperation, Government of India. [https://midh.gov.in/PDF/MIDH_Guidelines\(final\).pdf](https://midh.gov.in/PDF/MIDH_Guidelines(final).pdf)

Government of India. 2015. Micro Irrigation – Benefits/Utility.
<https://pmksy.gov.in/microirrigation/Archive/August2015.pdf>

Government of India. 2016. Guidelines for Construction of Anganwadi Centres Under MGNREGA in Convergence with ICDS Scheme of Ministry of Women and Child Development. Available at
<https://wcd.nic.in/sites/default/files/Guidelines%20for%20construct> (accessed July 11, 2023)

Government of India. 2017. Annual Report 2016–17: National Mission on Clean Ganga (Hindi). Ministry of Jal Shakti. https://nmcg.nic.in/writereaddata/fileupload/22_NMCG_Annual_Report_2016-17.pdf

Government of India. 2019a. Annual Report 2018–19: National Mission on Clean Ganga. Ministry of Jal Shakti. Available at https://nmcg.nic.in/writereaddata/fileupload/56_AnnualReport18-19.pdf (accessed May 25, 2019)

Government of India. 2019b. Watershed Development Component of PMKSY 2.0. Ministry of Jal Shakti. Available at <https://wdcpmksy.dolr.gov.in/aboutus> (accessed June 2, 2023)

Government of India. 2020a. Directorate of Economics and Statistics, Department of Agriculture and Farmers Welfare. https://eands.dacnet.nic.in/LUS_1999_2004.htm

Government of India. 2020b. Representation in Panchayats. *Press Information Bureau*. Available at <https://pib.gov.in/PressReleaseframePage.aspx?PRID=1658145> (accessed July 11, 2023)

Government of India. 2020c. Basic Framework of PMMSY. Ministry of Fisheries, Animal Husbandry and Dairying. Available at https://dof.gov.in/sites/default/files/2020-07/AnnexureFrameworktostatesUT_o.pdf (accessed July 6, 2023)

Government of India. 2020d. Namami Ganga Programme – at a Glance. Ministry of Jal Shakti. September. Available at <https://nmcg.nic.in/NamamiGanga.aspx> (accessed June 1, 2023)

Government of India. 2020e. PM Matsya Sampada Yojana Booklet. Department of Fisheries, Government of India. Available at https://dof.gov.in/sites/default/files/2020-07/Book_PMMSY_Framework_o.pdf (accessed July 6, 2023)

Government of India. 2020f. PMMSY Policy Guidelines. National Fisheries Development Board, Department of Fisheries, Government of India. Available at <https://nfdb.gov.in/PDF/PMMSY-Guidelines24-June2020.pdf> (accessed July 6, 2023)

Government of India. 2020g. Namami Ganga Magazine. National Mission for Clean Ganga, Department of Water Resources, River Development and Ganga Rejuvenation. Available at https://spmgttarakhand.uk.gov.in/files/16_Namami_Gange.pdf (accessed July 6, 2023)

Government of India. 2021a. Guidelines for New Generation Watershed Development Projects (WDC-PMKSY 2.0). Department of Land Resources, Ministry of Rural Development, Government of India.

Government of India. 2021b. Operational Guidelines of Per Drop More Crop Component of Pradhan Mantri Krishi Sinchayee Yojana. Department of Agriculture & Farmers Welfare, Ministry of Agriculture & Farmers Welfare. <https://pmksy.gov.in/microirrigation/Archive/Revised%20PDMC%20GL%202021.pdf>

Government of India. 2021c. Annual Master Circular 2020–21: MGNREGA, 2005. Ministry of Rural Development. https://nregaplus.nic.in/Netnrega/WriteReaddata/Circulars/2419Annual_Master_Circular_2020-21_English.pdf

Government of India. 2021d. Atal Bhujal Yojana (Atal Jal). Ministry of Jal Shakti. <https://ataljal.mowr.gov.in/About/About>

Government of India. 2021e. Frequently Asked Questions: Mahatma Gandhi National Rural Employment Guarantee Act 2005 (MGNREGA). Available at <https://static.pib.gov.in/WriteReadData/specificdocs/documents/2021/nov/doc2021112931.pdf> (accessed July 2, 2023)

Government of India. 2021f. Division-wise Information. New Delhi: Ministry of Rural Development. https://rural.nic.in/sites/default/files/o2%20_CIC_PartII_MG_NREGA%28F%29_O.pdf.

Government of India. 2022a. Beneficiaries Under MGNREGA. Press Information Bureau, 9 Feb. <https://pib.gov.in/Pressreleaseshare.aspx?PRID=1796871>

Government of India. 2022b. Improving Irrigation. Press Information Bureau, 7 April. <https://pib.gov.in/PressReleaseFramePage.aspx?PRID=1814491cc>

Government of India. 2022c. Unstarred Question No.2275 in Lok Sabha. New Delhi: Ministry of Agriculture & Farmers' Welfare. <https://.nic.in/loksabha/Questions/QResult15>

Government of India. 2022d. Year-End Review – 2022: Ministry of Rural Development. Press Information Bureau. Available at <https://pib.gov.in/PressReleasePage.aspx?PRID=1887438> (accessed May 15, 2023)

Government of India. 2022e. Annual Report 2021–22: National Mission for Clean Ganga. Ministry of Jal Shakti. https://nmcg.nic.in/writereaddata/fileupload/5_Annual%20Report%20Eng2021-22%20.pdf.

Government of India. 2022f. Department of Land Resources. <https://dolr.gov.in/en/about-us/about-department>

Government Of India. 2022g. Department of Agriculture and Farmers Welfare. <https://agricoop.gov.in/en/Dept>

Government of India. 2023a. Atal Bhujal Yojana (Atal Jal) Program Guidelines (Version 1.2). Department of Water Resources, River Development & Ganga, Ministry of Jal Shakti, Government of India.

Government of India. 2023b. Centrally Sponsored Scheme on Krishonnati Yojana – Integrated Development of Horticulture (MIDHI Implementation of the Scheme during 2023–24 – Administrative Approval – Reg. Government Order – F. No. L5OL2 / L / 2023-MIDH. Horticulture Division, Ministry of Agriculture and Farmers' Welfare, Government of India. <https://midh.gov.in/PDF/Administrative%20Approval%202023-24.pdf>

Government of India. 2023c. Economical Survey 2022–23 Statistical Appendix. <https://www.indiabudget.gov.in/economicsurvey/doc/stat/tab120.pdf>

Government of India. 2023d. India Sign \$130 million Loan to Promote Horticulture in Himachal Pradesh. Press Information Bureau, 12 June. <https://pib.gov.in/PressReleaseFramePage.aspx?PRID=1931629#:~:text=The%20Government%20of%20India%20and,the%20state%20of%20Himachal%20Pradesh>

Government of India. 2023e. Pollution Abatement Measures Under Namami Ganga Programme. Press Information Bureau, 6 April. <https://pib.gov.in/PressReleaseFramePage.aspx?PRID=1914354>

Government of India. 2023f. Union Minister Shri Giriraj Singh says, the Centre Today Asserted That It Is Fully Committed to Ensure the Wage Payment to Every Beneficiary of the MGNREGA Scheme. Press Information Bureau. Available at <https://pib.gov.in/PressReleaseDetailm.aspx?PRID=1908595> (accessed July 11, 2023)

Government of India. 2023g. About NMCg. Ministry of Jal Shakti. Available at https://nmcg.nic.in/about_nmcg.aspx (accessed May 24, 2023)

- Government of India. 2023h. NREGASoft. Ministry of Electronics and IT National Informatics Centre. Available at <https://www.nic.in/products/nregasoft/> (accessed July 12, 2023)
- Government of India. 2023i. WHO Report Highlights the Significant Impact of the 'Har Ghar Jal' Program on Public Health and Economic Savings. Ministry of Health and Family Welfare. Available at <https://pib.gov.in/PressReleaseFramePage.aspx?PRID=1930995>. (accessed July 25, 2023)
- Government of Sikkim. 2022. MNREGA: Mahatma Gandhi Rural Employment Guarantee Act, Sikkim. <https://sikkim.gov.in/departments/rural-management-development-department/mgnrega-mahatma-gandhi-national-rural-employment-guarantee-act-sikkim>
- Howlett, M.; Cashore, B. 2014. Conceptualizing public policy In *Comparative policy studies: Conceptual and methodological challenges*, pp. 17-33. London: Palgrave Macmillan UK, 2014. https://doi.org/10.1057/9781137314154_2
- Institute for Social and Economic Change. 2017. Impact Evaluation of National Horticulture Mission (NHM) and Horticulture Mission for North East and Himalayan States (HMNEH) <https://midh.gov.in/PDF/Impact%20Evaluation%20of%20NHM%20HMNEH.pdf>.
- Katyaini, S.; Barua, A. 2016. Water Policy at Science–Policy Interface – Challenges and Opportunities for India. *Water Policy* 18 (2): 288–303. <https://doi.org/10.2166/wp.2015.086>
- Katyaini, S.; Barua, A.; Duarte, R. 2020. Science-policy interface on water scarcity in India: Giving ‘visibility’ to unsustainable virtual water flows (1996–2014). *Journal of Cleaner Production* 275: 124059. <https://doi.org/10.1016/j.jclepro.2020.124059>
- Katyaini, S.; Mukherjee, M.; Barua, A. 2021. Water–Food Nexus through the Lens of Virtual Water Flows: The Case of India. *Water* 13 (6): 768. <https://doi.org/10.3390/w13060768>
- Kaushal, N.; Muchomba, F. M. 2015. How Consumer Price Subsidies Affect Nutrition. *World Development* 74: 25–42. <https://doi.org/10.1016/j.worlddev.2015.04.006>
- Khanduja, E.; Negi, U.; Chaturvedi, K.; Gupta, S.; Bassi, N. 2023. Ripples. New Delhi: Council on Energy, Environment and Water. <https://www.ceew.in/sites/default/files/managing-indias-water-resources-in-sustainable-equitable-ways.pdf>
- Khera, R. 2006. Political Economy of State Response to Drought in Rajasthan, 2000–03. *Economic and Political Weekly* 41: 5163–5172. <https://www.jstor.org/stable/4419031>
- Kholod, N.; Evans, M.; Khan, Z.; Hejazi, M.; Chaturvedi, V. 2021. Water–Energy–Food Nexus in India: A Critical Review. *Energy and Climate Change* 2: 100060. <https://doi.org/10.1016/j.egycc.2021.100060>
- Kim, N.; Das, S.; Neog, K.; Sugam, R. K. 2018. *The Perfect Storm – Pathways to Managing India’s Water Sector Sustainably*. New Delhi: Council on Energy, Environment and Water. https://www.ceew.in/sites/default/files/CEEW-UN-The-Perfect-Storm-June18_1.pdf
- Kochar, A. 2005. Can Targeted Food Programs Improve Nutrition? An Empirical Analysis of India's Public Distribution System. *Economic Development and Cultural Change* 54 (1): 203–235. University of Chicago Press. <https://doi.org/10.1086/431260>
- K. S., Aditya.; Tajuddin, S. K.; Kishore A. 2018. Adoption of Crop Insurance and Impact: Insights from India. *Agricultural Economics Research Review* 31 (2): 63–174 <http://dx.doi.org/10.5958/0974-0279.2018.00034.4>

- Kumar, A.; Singh, K. M.; Sinha, S. 2013. Institutional Credit to Agriculture Sector in India: Status, Performance and Determinants. *Agricultural Economics Research Review* 23 (2): 253–264.
https://www.researchgate.net/publication/227365313_Institutional_Credit_to_Agriculture_Sector_in_India_Status_Performance_and_Determinants
- Kumar, D.; Pillay, P. K.; Manoj, T. K. 2018. Food Security in India: Evolution, Efforts and Problems. Strategic Analysis 595–611. *Routledge*. <https://doi.org/10.1080/09700161.2018.1560916>
- Kumar, M. D.; Sivamohan, M.V.K.; Narayanamoorthy, A. 2012. The Food Security Challenge of the Food–Land–Water Nexus in India. *Food Security* 4: 539–556. 10.1007/s12571-012-0204-1
- Kumar, M. D.; Sivamohan, M.V.K.; Bassi, N. 2022. Agrarian Crisis in India. *Sage India*.
https://www.researchgate.net/publication/361207183_Agrarian_Crisis_in_India_Status_Dimensions_and_Mitigation_Strategies
- Kumar, M. D; Bassi, N.; Narayanamoorthy, A.; Sivamohan, M. V. K. 2014. The Water, Energy and Food Security Nexus: Lessons from India for Development. *Routledge*.
<https://www.routledge.com/The-Water-Energy-and-Food-Security-Nexus-Lessons-from-India-for-Development/t/Kumar-Bassi-Narayanamoorthy-Sivamohan/p/book/9781138574762>
- Kumar, M.D.; Bassi, N.; Singh, O. P. 2020. Rethinking on the Methodology for Assessing Global Water and Food Challenges. *International Journal of Water Resources Development* 36 (2–3): 547–564.
<https://doi.org/10.1080/07900627.2019.1707071>
- Kumar, R.S.; Kundu, S.; Kundu, B.; Binu, N.K.; Shaji, M. 2021. The Impacts of Climate Change, edited by Trevor M. Letcher. *Science Direct* 255–287. Elsevier. <https://doi.org/10.1016/B978-0-12-822373-4.00021-5>
- Kumar, S.; Madhu, M.; Mondal, B.; Kumar, A. 2022. Tracing the Trajectory of Watershed Development in India Using Watershed Guidelines: Policy Insights. *Current Science* 123 (8).
<https://doi.org/10.18520/cs/v123/i8/968-974>
- Malik, M.T.R.; Pazir, D. 2019. Fertilizer Subsidies and Indian Agriculture. *Research Journal of Humanities and Social Sciences* 10 (1): 241–247. <https://doi.org/10.5958/2321-5828.2019.00044.5>
- Martinez, P.; Blanco, M.; Campos, B.C. 2018. The Water–Energy–Food Nexus: A Fuzzy-Cognitive Mapping Approach to Support Nexus-Compliant Policies in Andalusia (Spain). *Water* 10: 664.
<https://doi.org/10.3390/w10050664>
- Mishra, J. S.; Kumar, R.; Saurabh, K.; Bhatt, B. P. 2019. Conservation Agriculture for Climate Resilient Farming & Doubling Farmers’ Income. Patna: ICAR Research Complex for Eastern Region.
<https://icarrcer.icar.gov.in/storage/Final-Compendium.pdf>
- Nayak, N.C.; Jenamani, M.; Sahoo, B.K. 2017. Assessment of the Convergence Activities under Mahatma Gandhi NREGA in Odisha. National Institute of Rural Development and Panchayati Raj.
- Neog, K.; Chaturvedi, V. 2022. Chapter 6: Exploring Policy Coherence in India’s Electricity–Water Nexus. In *Handbook on the Water–Energy–Food Nexus*. Edward Elgar Publishing.
<https://doi.org/10.4337/9781839100550.00012>
- Nilsson, M.; Weitz, N. 2019. Governing Trade-Offs and Building Coherence in Policy-Making for the 2030 Agenda. *Politics and Governance* 7 (4): 254–263. <https://doi.org/10.17645/pag.v7i4.2229>
- NITI Aayog; DMEO. 2020. Evaluation of Centrally Sponsored Schemes in Agriculture, Animal Husbandry and Fisheries Sector. *Volume 2: Agriculture*. NITI Aayog and Development Monitoring and Evaluation Office (DMEO)

NITI Aayog. 2021. SDG India Index and Dashboard 2020–21.

https://sdgindiaindex.niti.gov.in/assets/Files/SDG3.O_Final_O4.O3.2021_Web_Spreads.pdf

OECD. 2015. The Framework for Policy Coherence for Sustainable Development. Organisation for Economic Co-operation and Development.

https://www.oecd.org/gov/pcsd/2015%20PCSD%20FRAMEWORK_Updated%20Oct2015.pdf

Omara, P.; Aula, L.; Oyebiyi, F.; Raun, W.R. 2019. World Cereal Nitrogen Use Efficiency Trends: Review and Current Knowledge. *Agrosystems, Geosciences & Environment* 2 (1): 1–8.

<https://doi.org/10.2134/age2018.10.0045>

Parris, K. 2010. Sustainable Management of Water Resources in Agriculture. *OECD Studies on Water*. Paris: OECD Publishing. <https://doi.org/10.1787/9789264083578-en>.

Pathak, H.; Mishra, J. P.; Mohapatra, T. 2022. *Indian Agriculture after Independence*. New Delhi: Indian Council of Agricultural Research, 426.

<https://icar.org.in/sites/default/files/2023-02/Indian-Agriculture-after-Independence.pdf>

Pingali, P.; Mittra, B.; Rahman, A. 2017. The Bumpy Road from Food to Nutrition Security – Slow Evolution of India’s Food Policy. *Global Food Security* 15: 77–84. <https://doi.org/10.1016/j.gfs.2017.05.002>

Pingali, P.; Feder, G. 2017. Agriculture and Rural Development in a Globalizing World. *Routledge*.

<https://doi.org/10.4324/9781315314051>

Press Information Bureau. 2022. Doubling of Farmers Income. Press Information Bureau, December 13.

<https://pib.gov.in/PressReleasePage.aspx?PRID=1883177>

Quality Council of India. 2022. Atal Bhujal Yojana. Quality Control of India.

[https://qcin.org/ck-docs/1653636625.Quality%20India%20Magazine%20\(Jan-Mar%202022\).pdf](https://qcin.org/ck-docs/1653636625.Quality%20India%20Magazine%20(Jan-Mar%202022).pdf)

Radhakrishna, R. 2005. Food and Nutrition Security of the Poor: Emerging Perspectives and Policy Issues. *Economic and Political Weekly* 40 (18): 1817–1821.

<https://www.epw.in/journal/2005/18/perspectives/food-and-nutrition-security-poor.html>

Reserve Bank of India. 2019. Report of the RBI Internal Working Group to Review Agricultural Credit. Reserve Bank of India. <https://www.rbi.org.in/Scripts/PublicationReportDetails.aspx?UrlPage=&ID=942>

Righettini, M.S.; Lizzi, R. 2022. How Scholars Break Down ‘Policy Coherence’: the Impact of Sustainable Development Global Agendas on Academic Literature. *Environmental Policy and Governance* 32 (2): 98–109.

<https://doi.org/10.1002/eet.1966>

Ritchie, H. 2021. Can We Reduce Fertilizer Use Without Sacrificing Food Production? Our World in Data.

<https://ourworldindata.org/reducing-fertilizer-use>

Rosencranz, A.; Puthucherril, T. G.; Tripathi, S.; Gupta, S. 2021. Groundwater Management in India's Punjab and Haryana: a Case of Too Little and Too Late?. *Journal of Energy and Natural Resources Law* 40 (2): 225–250.

<https://doi.org/10.1080/02646811.2021.19561>

Salmoral, G.; Walschobauer, J.; Schaap, C.E.N.; Alhajaj, A. 2019. Water Diplomacy and Nexus Governance in a Transboundary Context: in the Search for Complementarities. *The Science of The Total Environment* 690: 85–96.

<http://dx.doi.org/10.1016/j.scitotenv.2019.06.513>

Sarkar, A.; Das, A. 2014. Groundwater Irrigation–Electricity–Crop Diversification Nexus in Punjab: Trends, Turning Points, and Policy Initiatives. *Economic and Political Weekly* 49 (52): 64–73.
<https://www.jstor.org/stable/24481208>

Sehgal Foundation. 2022. Agricultural Diversification and Soil Health. Sehgal Foundation.
<https://www.smsfoundation.org/agricultural-diversification-and-soil-health/#:~:text=This%20practice%20builds%20soil%20health,a%20key%20component%20in%20farming>

Sharma, B.R.; Gulati, A.; Mohan, G.; Manchanda, S.; Ray, I.; Amarasinghe, U. 2018. Water Productivity Mapping of Major Crops. National Bank for Agriculture and Rural Development and United Nations Development Programme.
<https://www.nabard.org/auth/writereaddata/tender/1806181128Water%20Productivity%20Mapping%2>

Shivalingaiah, Y.; Ganesamoorthi, S.; Arundhati, C. 2022. Seminar Report II on MIDH. *Rural Agricultural Work Experience Program (RAWES)*. <https://rawe2020.in/wp-content/uploads/2022/11/Seminar-2-report-Final-1.pdf>

Taneja, G.; Katyaini, S.; Bhattacharjee, S.; Chaturvedi, K.; Mitra, A.; Verma, S.; Bassi, N. 2023. Stakeholder Consultation on Policy Coherence among Food, Land, and Water Systems in India. *NPS Workshop Proceedings*, 10

United Nations. n.d. About Policy Coherence.
<https://www.un.org/development/desa/cdpmo/what-we-do/areas-of-work/policy-coherence>

United Nations Development Group. 2017. Theory of Change UNDAF Companion Guidance. Available at <https://unsdg.un.org/sites/default/files/UNDG-UNDAF-Companion-Pieces-7-Theory-of-Change.pdf> (accessed on May 20, 2023)

UNDP. 2013. Report on Convergence Initiatives in India – an Overview. United Nations Development Programme.
<https://www.undp.org/india/publications/report-convergence-initiatives-india-overview>

UNEP. 2022. Methodology for SDG-Indicator 17.14.1: Mechanisms in Place to Enhance Policy Coherence for Sustainable Development. United Nations Environment Programme. Available at <https://wedocs.unep.org/handle/20.500.11822/38262> (accessed March 21, 2023)

Weitz, N.; Strambo, C.; Benedict, E.K.; Nilsson, M. 2017. Closing the Governance Gaps in the Water–Energy–Food Nexus: Insights from Integrative Governance. *Global Environmental Change (Science Direct)* 45: 165–173. <https://doi.org/10.1016/j.gloenvcha.2017.06.006>






World Bank. 2023. Consumer Price Index (2010 = 100) – India. World Bank.
<https://data.worldbank.org/indicator/FP.CPI.TOTL?locations>

ANNEXURES







1. Quantitative and qualitative criteria used in the methodology

Table A1: Details of the quantitative criteria used to select the policies.

Quantitative criteria	Short explanation	Question/practical implications	Application
 1. Implementation	Selected policies create a mechanism for implementation with spaces for national and sub-national stakeholders to meaningfully participate in decision-making and implementation.	Is there an institution, implementation platform, or mechanism created by the policy for its <u>implementation</u> ?	If yes > inclusion If no > exclusion
 2. Coherence across impact areas/ cross-sectoral	Selected policies are cross-sectoral and demonstrate potential impacts across several impact areas.	Does the policy touch on <u>three or more</u> impact areas?	If yes > inclusion If no > exclusion
 3. Environmental sustainability	Selected policies consider side impacts on the environment and the ability of future generations to meet their basic needs.	Is <u>environmental health and biodiversity</u> one of the impact areas of the policy?	If yes > inclusion If no > exclusion
 4. Time span	Selected policies have some level of maturity so that their modes of implementation can be analysed.	Has the policy been enacted <u>on or before 2020</u> ?	If yes > inclusion If no > exclusion
 5. Impact, scope, and level of ambition	<p>Selected policies have a high level of ambition, are expected to be highly impactful (breadth, depth), and contribute to the implementation of broader national development goals and strategies.</p> <p>The level of ambition and expected impacts are approximated by financial commitments.</p>	What is the <u>average actual expenditure in the last three years</u> ?	Ranking and selection of top 10

Source: Authors' analysis

Table A2: Details of the qualitative criteria used to select the policies

Qualitative criteria	Short explanation/guiding question
 6. Vertical and horizontal institutional coherence	Whether and how policy implementation requires coordination between two or more government agencies (e.g., water and agriculture or national and local governments)?
 7. Social inclusion	Whether and how the social inclusion of vulnerable sectors in the policy is required for success and to what extent is it achieved?
 8. External consistency	Whether and how the policy implies cross-sectoral dependency, i.e., aligns or conflicts with other policies?
 9. Flexibility and adaptability	Whether and how is policy adaptation to unexpected changes in the system (natural, social, political) required and achieved?

Source: Authors' analysis

2. Analytical framework

1. Vertical and horizontal institutional coherence

1.1. Intra-ministerial coordination

S. no.	Governance level		Key aspects	Stages in the policy cycle				Question no.	Source of data (policy analysis/ interviews with experts/ government officials)
				Formulation	Implementation	Monitoring and evaluation	Impact evaluation		
I.	Central	a.	Existence					2.1	
		b.	Nature						
		c.	Challenges faced						
		d.	Opportunities /avenues for improvement						
II.	State	a.	Existence					2.4	
		b.	Nature						
		c.	Challenges faced						
		d.	Opportunities /avenues for improvement						
III	Central and state coordination (vertical)	a.	Existence					2.11	
		b.	Nature						
		c.	Challenges faced (current gaps)						
		d.	Opportunities and avenues for improvement (budget, planning implementation, monitoring and evaluation (M&E)						
IV.	District	a.	Existence					2.6	
		b.	Nature						
		c.	Challenges faced						
		d.	Opportunities/ avenues for improvement						

1.2. Inter-departmental coordination

S. no.	Governance level		Key aspects	Stages in the policy cycle				Question no.	Source of data (policy analysis/ interviews with experts/ government officials)
				Formulation	Implementation	Monitoring and evaluation	Impact evaluation		
I.	Central	a.	Existence					2.3	
		b.	Nature						
		c.	Challenges faced						
		d.	Opportunities /avenues for improvement						
II.	State	a.	Existence					2.5	
		b.	Nature						
		c.	Challenges faced						
		d.	Opportunities /avenues for improvement						
III.	District	a.	Existence					2.7	
		b.	Nature						
		c.	Challenges faced (current gaps)						
		d.	Opportunities/ avenues for improvement						

1.3. Role of civil society organisations/local bodies/communities in vertical and horizontal coordination

S. no.	Governance level		Key aspects	Stages in the policy cycle				Question no.	Source of data (policy analysis/ interviews with experts/ government officials)
				Formulation	Implementation	Monitoring and evaluation	Impact evaluation		
I.	Civil society organisation (CSO)	a.	Nature (inputs being taken)					2.8	
II.	Local bodies	a.	Nature (inputs being taken)					2.9	
III.	Communities	a.	Nature (inputs being taken)					2.10	

2. Social inclusion

S. no.	Key aspects	Stages in the policy cycle				Question no.	Source of data (policy analysis/ interviews with experts/ government officials)
		Formulation	Implementation	Monitoring and evaluation	Impact evaluation		
a	Existence of dedicated processes for involving the vulnerable group (please specify) in the policy directly					3.1 + 3.2	
b	Existence of dedicated processes for involving the vulnerable group through representation by the subject expert					3.4	
c	Nature (extent to which it has been successful)					3.1 + 3.3	
d	Challenges faced (extent to which it has been successful)					3.1 + 3.3	
e	Opportunities/avenues for improvement					3.1	

3. External consistency

S. no.	Key aspects	Level of governance	Name of the policies	Specific examples Mechanism in place (dialogue, collaboration) to reduce unintended negative consequences and build positive impact Best practices or examples that are followed for ensuring effective policy coherence. If so, what are they?	Suggestions to reduce unintended negative consequences and build positive impacts	Question no.	Source of data (policy analysis/ interviews with experts/ government officials)
I.	Consistency/alignment with other policies within the scope of food, land, and water (FLW)	Central				2.2 + 7.2	
		State					
II.	Inconsistency/non-alignment with other policies/ schemes (unintended negative consequences)	Central				4.1 + 4.2 + 6.5	
		State					

3.1. Consistency/alignment with other policies

S. no.	Key aspects	Stages in the policy cycle				Question no.	Source of data (policy analysis/ interviews with experts/ government officials)
		Formulation	Implementation	Monitoring and evaluation	Impact evaluation		
I.	Existence of a checklist template to identify the extent of policy/ scheme coherence and at what policy stage					4.4 + 4.6	
II.	Existence of indicators in the policy/scheme that address the link with the FLW nexus					4.5	
III.	Nature of indicators in the policy/scheme that address the link with the FLW nexus						
IV.	Data on policy coherence in the public domain					4.7	
	a. Existence						
	b. Nature						
	c. Challenges faced						
	d. Avenues/opportunities for improvement						

3.2. Inconsistency/non-alignment with other policies/schemes

S. no.	Key aspects	Stages in the policy cycle				Question no.	Source of data (policy analysis/ interviews with experts/ government officials)
		Formulation	Implementation	Monitoring and evaluation	Impact evaluation		
I.	Coordination mechanism to address external inconsistencies					4.8	
	a. Existence						
	b. Nature						
	c. Challenges faced						
	d. Avenues/opportunities to improve						
II.	Dedicated process to address points of conflicts/contention among various departments and ministries					4.9	
	a. Existence						

3.3. Coherence with the SDGs

Analysis in the form of a frequency chart with the most recurrent responses and the number of who people gave that response, followed by the ranking of the responses (Q 4.3).

4. Flexibility and adaptability to unexpected changes (natural, social, and political)

S. no.	Key aspects	Existence	Non-existence	Reason for non-existence	Question no.	Source of data (policy analysis/ interviews with experts/ government officials)
I.	Data management information system for M&E				5.1	
II.	Ombudsman, council, commission, or committee for scrutinising impact and suggesting measures				5.2	
III.	Mechanism for regular appraisal of the policy				5.3	
IV.	Baseline for regular appraisal of the policy				5.3	
V.	Frequency for regular appraisal of the policy				5.3	

5. (Policy) Landscape assessment

5.1. Policy coherence with broader objectives of the government

S. no.	Key aspects	Existence	Non-existence	Reason for non-existence	Question no.	Source of data (policy analysis/ interviews with experts/ government officials)
1.	Alignment with broader government objectives				5.1	
2.	Supportive political ecosystem around the scheme/policy for enabling policy coherence across the FLW sector				5.2	
3.	Mechanisms in place to promote the alignment of private and public finance nationally with				5.3	
a.	Policy coherence objectives					
b.	Track related					

5.2. Policy coherence with broader objectives of the government

S. no.	Key aspects of institutionalisation of India's commitment towards policy coherence for sustainable development at the highest political level	Kind of response expected (categorising the responses post analysis)	Question no.	Source of data (policy analysis/ interviews with experts/ government officials)
I.	Set timelines for the achievement of policy coherence objectives		5.4	
II.	A dedicated budget			
III.	A formalised process			
IV.	Defined roles and responsibilities			
V.	National/international commitments expenditures			

5.3. Policy coherence for sustainable development at the highest political level

S. no.	Key aspects	Existence	Non-existence	Kind of response expected (categorising the responses post analysis)	Question no.	Source of data (policy analysis/ interviews with experts/government officials)
I.	In the policy cycle, at present				5.3.1	
II.	In relation to project funding and policy advocacy					
III.	In alignment with broader government objectives and this scheme specifically (please explain if either yes or no)					

5.4 Policy convergence: multi-level, multi policies

S. no.	Key aspects	Kind of response expected (categorising the responses post analysis)	Question no.	Source of data (policy analysis/ interviews with experts/ government officials)
I.	Provisions in the policy for convergence		5.3.2	
a.	Existence			
b.	Nature (how effective it has been)			
c.	Challenges faced (if not effective, understand why and seek their suggestion)			
d.	Avenues and opportunities for improvement (how it can be improved and what other opportunities for convergence exist)			

3. Questionnaire for the study

This questionnaire was developed and will be administered as one of the research steps of a study titled Policies and Schemes on Coherence for Food, Land, and Water in India. The proposed study is part of the National Policies and Strategies (NPS) for FLW systems' transformation, a One CGIAR initiative implemented in six countries across three continents – Asia, Africa, and Latin America. The current study is being undertaken by the Council on Energy, Environment, and Water (CEEW) and International Water Management Institute (IWMI). The purpose of this questionnaire is to understand how policy scheme implementers and subject experts view the policy/scheme/governance instrument as delivering on the criteria listed below. This questionnaire has 36 questions, divided across 75 categories.

The identity of the respondent(s) to whom this questionnaire was administered will not be revealed at any stage of the study to the wider public beyond the team of researchers in this project.

Section 1: General

- Date:
- Start time:
- Venue of interview:
- Name of respondent:
- Organisation of respondent:
- Designation of respondent:
- Name of interviewer:
- Name of note-taker:
- Scheme for which response is taken:

Section 2: Vertical and horizontal institutional coherence

(In this section, the goal is to assess the nature and extent of horizontal and vertical coordination mechanisms – both inter-ministerial and intra-ministerial.)

Q.2.1) Does the scheme have an institutionalised provision to establish inter-ministerial coordination at the central level? If yes, what kind of coordination happens (or how), and is any further improvement required? If not, what sorts of coordination failures does this lack of institutionalised provision lead to, and do you have any suggestions on how it can be improved?

- Policy/scheme formulation
- Policy/scheme implementation
- Policy/scheme M&E
- Policy/scheme impact evaluation

Q.2.2) Are there any mechanisms adopted by the policy to ensure dialogue and collaboration with other existing policies to promote policy coherence? (Yes/No). If yes, please provide specific examples.

Q.2.3) Does the scheme have an institutionalised provision to establish intra-departmental coordination at the central level? If yes, what kind of coordination happens (or how) and is any further improvement required? If not, what sorts of coordination failures does this lack of institutionalised provision lead to, and do you have any suggestions on how it can be improved?

- Policy/scheme formulation
- Policy/scheme implementation
- Policy/scheme M&E
- Policy/scheme impact evaluation

Q.2.4) Does the scheme have an institutionalised provision to establish inter-ministerial coordination at the state level? If yes, what kind of coordination happens (or how), and is any further improvement required? If not, what sorts of coordination failures does this lack of institutionalised provision lead to, and do you have any suggestions on how it can be improved?

- Policy/scheme formulation
- Policy/scheme implementation
- Policy/scheme M&E
- Policy/scheme impact evaluation

Q.2.5) Does the scheme have an institutionalised provision to establish intra-departmental coordination at the state level? If yes, what kind of coordination happens (or how), and is any further improvement required? If not, what sorts of coordination failures does this lack of an institutionalised provision lead to, and do you have any suggestions on how it can be improved?

- Policy/scheme formulation
- Policy/scheme implementation
- Policy/scheme M&E
- Policy/scheme impact evaluation

Q.2.6) Does the scheme have an institutionalised provision to establish inter-ministerial coordination at the district level? If yes, what kind of coordination happens (or how), and is any further improvement required? If not, what sorts of coordination failures does this lack of institutionalised provision lead to, and do you have any suggestions on how it can be improved?

- Policy/scheme formulation
- Policy/scheme implementation

- Policy/scheme M&E
- Policy/scheme impact evaluation

Q.2.7) Does the scheme have any institutionalised provision to establish intra-departmental coordination at the district level? If yes, what kind of coordination happens (or how), and is any further improvement required? If not, what sorts of coordination failures does this lack of institutionalised provision lead to, and do you have any suggestions on how it can be improved?

- Policy/scheme formulation
- Policy/scheme implementation
- Policy/scheme M&E
- Policy/scheme impact evaluation

Q.2.8) What has been/currently is the role of CSOs (non-government stakeholders, academia, and so on) at the centre level in the entire policy/scheme/scheme cycle?

- Policy/scheme formulation
- Policy/scheme implementation
- Policy/scheme M&E
- Policy/scheme impact evaluation

Q.2.9) What is the role of local bodies in the entire policy/scheme cycle? How are their inputs being considered in policy-making processes?

- Policy/scheme formulation
- Policy/scheme implementation
- Policy/scheme M&E
- Policy/scheme impact evaluation

Q.2.10) What is the role of the community in the entire policy/scheme cycle? How are their inputs being considered in policy-making processes?

- Policy/scheme formulation
- Policy/scheme implementation
- Policy/scheme M&E
- Policy/scheme impact evaluation

Q.2.11) Is there central and state-level coordination in the policy/scheme cycle? What are the current gaps in central- and state-level coordination, and what can be improved (in the budget, planning, implementation, and M&E)?

Section 3: Social inclusion

(In this section, the goal is to assess the nature and extent of inclusion of vulnerable groups and groups most impacted by the policy/scheme at various stages of a policy/scheme cycle.)

Q.3.1) What is the nature of vulnerability that the policy/scheme is addressing? In your opinion, to what extent has the scheme been successful in the inclusion of various categories of vulnerable groups and what can be improved?

- Caste-based (Scheduled Castes (SC)/Scheduled Tribes (ST)/Other Backward Class (OBC))
- Class-based (size of landholding, rich or poor)
- Gender-based
- Rural, urban
- Youth groups
- Intersectionality of the above (how many and which categories)

Q.3.2) Does the policy/scheme have a dedicated process for involving vulnerable groups across the following stages of the policy/scheme cycle?

- Policy/scheme formulation
- Policy/scheme implementation
- Policy/scheme M&E
- Policy/scheme impact evaluation

Q.3.3) Explain the process for involving vulnerable groups across the following stages of the policy/scheme cycle:

- Policy/scheme formulation
- Policy/scheme implementation
- Policy/scheme M&E
- Policy/scheme impact evaluation

Q.3.4) Are subject experts a part of the process of inclusion of vulnerable groups in the following stages of the scheme/policy cycle?

- Policy/scheme formulation
- Policy/scheme implementation
- Policy/scheme M&E
- Policy/scheme impact evaluation

Section 4: External consistency

(In this section, the goal is to understand whether the policy/scheme being considered compliments or conflicts with policies on which it has a bearing or with policies that have a bearing on it, in the FLW sectors.)

Q.4.1) Map out external inconsistencies with existing policies and give specific examples of the scheme not being in alignment with other policies/schemes of either the central government/any state government.

Q.4.2) Does the policy have any unintended negative consequences? If yes, what are those, and do you have any suggestions on how to avoid them?

Q.4.3) Assess the impact of the scheme/policy on the Sustainable Development Goals (SDGs) that are mapped against it using the Likert scale given. Support your rating with a reason. Where the rating is 4, please elaborate on what can be done better to arrive at a rating of 5.

CGIAR impact area	SDG covered	Rating	Reason
-2 = high negative impact/ -1 = medium negative impact/ 0 = no impact or neutral/ +1 = medium positive impact/ +2 = high positive impact			
Nutrition, health, and food security	SDG2.1 (End hunger and ensure access by all people, in particular the poor and people in vulnerable situations, including infants, to safe, nutritious, and sufficient food all year round)		
	SDG 2.2 (End all forms of malnutrition, including achieving, by 2025, the internationally agreed targets on stunting and wasting in children under five years of age and address the nutritional needs of adolescent girls, pregnant and lactating women, and older persons)		
	SDG 3.1 (Reduce global maternal mortality)		
	SDG 3.2 (Reduce neonatal mortality)		
	SDG 6.3 (By 2030, improve water quality by reducing pollution, eliminating dumping and minimising the release of hazardous chemicals and materials, halving the proportion of untreated wastewater, and substantially increasing recycling and safe reuse globally)		
Poverty reduction, livelihoods, and jobs	SDG 1.1 (Eradicate extreme poverty for all people everywhere)		
	SDG 1.2 (By 2030, reduce at least by half the proportion of men, women, and children of all ages living in poverty in all its dimensions according to national definitions)		
	SDG 5a (Undertake reforms to give women equal rights to economic resources, as well as access to ownership and control over land and other forms of property, financial services, inheritance and natural resources, in accordance with national laws)		
	SDG 8.5 (Achieve full and productive employment and decent work for all women and men, including for young people and persons with disabilities, and equal pay for work of equal value)		
	SDG 10.2 (Empower and promote the social, economic, and political inclusion of all, irrespective of age, sex, disability, race, ethnicity, origin, religion, or economic or other status)		
Climate change adaptation and mitigation	SDG 1.5 (Build the resilience of the poor and those in vulnerable situations and reduce their exposure and vulnerability to climate-related extreme events and other economic, social, and environmental shocks and disasters)		
	SDG 2.4 (Ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, help maintain ecosystems, and strengthen the capacity for adaptation to climate change, extreme weather, droughts, flooding, and other disasters by progressively improving land and soil quality)		

	SDG 13.1 (Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries)		
	SDG 15.1 (Ensure the conservation, restoration, and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular, forests, wetlands, mountains, and drylands, in line with obligations under international agreements)		
	SDG 15.2 (Promote the implementation of sustainable management of all types of forests, halt deforestation, restore degraded forests, and substantially increase afforestation and reforestation globally)		
	SDG 15.3 (Combat desertification, restore degraded land and soil, including land affected by desertification, droughts, and floods, and strive to achieve a land degradation-neutral world)		
Environmental health and biodiversity	SDG 2.4 (Ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen the capacity for adaptation to climate change, extreme weather, droughts, flooding, and other disasters, and that progressively improve land and soil quality)		
	SDG 2.5 (By 2020, maintain the genetic diversity of seeds, cultivated plants, and farmed and domesticated animals and their related wild species, including through soundly managed and diversified seed and plant banks at the national, regional, and international levels, and promote access to, and fair and equitable sharing of, the benefits arising from the utilisation of genetic resources and associated traditional knowledge, as internationally agreed)		
	SDG 6.3 (By 2030, improve water quality by reducing pollution, eliminating dumping, and minimising the release of hazardous chemicals and materials, halving the proportion of untreated wastewater, and substantially increasing recycling and safe reuse globally)		
	SDG 6.6 (Protect and restore water-related ecosystems, including mountains, forests, wetlands, rivers, aquifers, and lakes)		
	SDG 14.1 (By 2025, prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities, including marine debris and nutrient pollution)		
	SDG 14.2 (Sustainably manage and protect marine and coastal ecosystems to avoid significant adverse impacts, including by strengthening their resilience and taking action for their restoration in order to achieve healthy and productive oceans)		
	SDG 15.1 (Ensure the conservation, restoration, and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains, and drylands, in line with obligations under international agreements)		

	SDG 15.2 (Promote the implementation of the sustainable management of all types of forests, halt deforestation, restore degraded forests, and substantially increase afforestation and reforestation globally)		
	SDG 15.3 (Combat desertification; restore degraded land and soil, including land affected by desertification, droughts, and floods; and strive to achieve a land degradation-neutral world)		
Gender equality, youth, and social inclusion	SDG 2.3 (Doubling the agricultural productivity and incomes of small-scale food producers including women)		
	SDG 5a (Undertaking reforms to give women equal rights to economic resources, ownership and/or control of land and other forms of property, financial services, inheritance, and natural resources, in accordance with national laws)		
	SDG 5b (Enhancing the use of enabling technology, in particular information and communications technology, to promote the empowerment of women)		
	SDG 10.2 (Empowering and promoting the social, economic, and political inclusion of all)		
	SDG 10.3 (Ensure equal opportunity and reduce inequalities of outcome, including by eliminating discriminatory laws, policies, and practices and promoting appropriate legislation, policies, and action in this regard)		
	SDG 6.2 (Achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations)		

Q.4.4) Does the scheme have any checklist or templates to identify the extent of policy/scheme coherence? If the answer is no, please skip questions 4.4 and 4.5.

- Policy formulation
- Policy/scheme implementation
- Policy/scheme M&E
- Policy/scheme impact evaluation

Q.4.5) What are the indicators that the policy/scheme is mapping to address the FLW nexus in the following stages:

- Policy formulation
- Policy/scheme implementation
- Policy/scheme M&E
- Policy/scheme impact evaluation

Q.4.6) Did these checklists emerge from the policy/scheme formulation process? If not, at which stage of the policy cycle were they formed?

- Yes
- No. Give reason.

Q.4.7) Is the data on policy coherence at all stages of the policy cycle available in the public domain?

- Yes. How is it working and what can be improved?
- No. Give reason.

Q.4.8) Is there a coordination mechanism/apex body to address the trade-offs between the sectors that are likely to be influenced by the policy/scheme and ensure external consistency?

- Yes. How is it working and what can be improved?
- No. Give reason.

Q.4.9) Has a dedicated process been laid out to address points of conflicts/contention among various departments and ministries at the following stages:

- Policy formulation
- Policy/scheme implementation
- Policy/scheme M&E
- Policy/scheme impact evaluation

Section 5: Flexibility and adaptability

(In this section, the goal is to understand the nature and extent of adaptability of the policy/scheme to unexpected changes (natural, social, political) in the landscape within which it operates.)

Q.5.1) Is there a data management information system to track the M&E of the policy/scheme?

- Yes.
- No. Give reason.

Q.5.2) Does the scheme have a provision for an ombudsman, council, commissioner, or committee to scrutinise the impact and suggest measures for its evolution and adaptability to strengthen policy/ scheme coherence?

- Yes.
- No. Give reason.

Q.5.3) Is there a mechanism for regular appraisal of the policy/scheme? If yes, how frequent is it, and what is the basis?

- Yes.
- No. Give reason.

Section 6: Landscape assessment

(only for sectoral experts outside the government)

Q.6.1) Is this scheme in alignment with broader government objectives?

- Yes
- No

Q.6.2) Has the country institutionalised its commitment towards policy coherence for sustainable development at the highest political level?

- Set timelines for the achievement of policy coherence objectives

- A dedicated budget
- A formalised process
- Defined roles and responsibilities
- National/international commitments

Q.6.3) Does the political ecosystem around the scheme/policy promote coherence across FLW?

- Yes.
- No. Give reason.

Q.6.4) What has the step-wise evolution of the scheme been like?

Q.6.5) Is this scheme in alignment with broader government objectives? Map out external inconsistencies with existing policies, and give specific examples of areas in which this scheme is not in alignment with other policies/schemes of either the central government/any state government?

Q.6.6) Does the country have mechanisms in place to promote the alignment of private and public finance nationally with policy coherence objectives and to track related expenditures?

- Yes
- No. Give reason.

Q.6.7) Does the international donor community specifically play a role in the policy cycle currently? Is the project funding and policy advocacy that they do in alignment with broader government objectives and this scheme specifically? (Please explain if either yes or no.)

Section 7: Overall comments on policy coherence

(for both governmental and non-governmental stakeholders)

Q.7.1) If we focus on better convergence with other schemes, what are the current provisions in the policy for convergence; how effective has it been (if not effective, understand why, and seek their suggestions on how it can be improved); and what other opportunities for convergence exist?

Q.7.2) Are there any best practices or examples that your ministry/department follows to ensure effective policy coherence? If so, what are they?

4. Inter-ministerial and inter-departmental coordination reflecting institutional coherence

Table A3: Most of the policies have well-established inter-ministerial and inter-departmental coordination reflecting institutional coherence in the planning and implementation of policies

Concerned ministry		Ministry of Agriculture and Farmers' Welfare		Ministry of Fisheries, Animal Husbandry and Dairying	Ministry of Rural Development		Ministry of Jal Shakti	
Level of governance	Policies	RKVY-PDMC	MIDH	PMMSY	WDC-PMKSY 2.0	MGNREGS	NMCG-NGP	ABY
	Stage							
Centre	Planning							
	Implementation							
	M&E							
	Impact evaluation							
State	Planning							
	Implementation							
	M&E							
	Impact evaluation							
District	Planning							
	Implementation							
	M&E							
	Impact evaluation							
Gram panchayat and community	Planning							
	Implementation							
	M&E							
	Impact evaluation							
CSOs	Planning							
	Implementation							
	M&E							
	Impact evaluation							

Green reflects existence; orange reflects non-existence.

Source: Authors' analysis

5. Background of policies

Rashtriya Krishi Vikas Yojana – Per Drop More Crop (RKVY-PDMC)

RKVY-PDMC, formerly called the Pradhan Mantri Krishi Sinchayee Yojana (PMKSY), oversees irrigation activities under four schemes. PDMC is one of these schemes aimed at enhancing water-use efficiency at the farm level by promoting micro-irrigation systems. The two important micro-irrigation systems in India are drip and sprinkler irrigation. In addition, the scheme supports the creation of micro-level water storage to supplement the water source for micro-irrigation. PDMC was implemented by the Department of Agriculture and Farmers Welfare in 2015–2022. The other three schemes were the Watershed Development Component (WDC-PMKSY), implemented by the Department of Land Resources; Har Khet Ko Paani (PMKSY-HKKP); and Accelerated Irrigation Benefit Programme (AIBP), implemented by the Department of Water Resources, River Development and Ganga Rejuvenation (Government of India 2015). After 2015–22, PDMC was incorporated under RKVY (Government of India 2022f).

PDMC has provided financial assistance to farmers for the adoption of micro-irrigation technologies. The total subsidy provided for under the guidelines is 55 per cent of the cost for small and marginal farmers and 45 per cent for other farmers (Government of India 2021a). Till 2022, INR 13,200 crore has been released by the union government under this scheme (Government of India 2021a). Micro-irrigation can play a pivotal role in boosting green growth in India. It has the potential to enhance farmers' incomes by 48.5 per cent by increasing crop yield and reducing input costs (NITI Aayog 2020). Thus, the overall mandate of the scheme is to enhance farm productivity and farmers' incomes by mainstreaming micro-irrigation practices and crop diversification and ensuring synergies with the activities of ongoing programmes and schemes. This reflects coherence across the FLW sectors.

Table A4: The table highlights the institutional set up for coherence at all three levels of governance in the RKVY-PDMC policy

Stages/ Governance levels	Formulation/planning	Implementation	M&E	Impact evaluation
Centre	National Steering Committee (NSC)		National Committee On Precision Agriculture And Horticulture (NCPAH)	
		National Executive Committee (NEC)		
	National Rainfed Area Authority (NRAA)			
		Suitable external agencies		
State	State Level Sanction Committee (SLSC)			
			Suitable external agencies	
District		District-level implementation committee (DLIC)		
Local bodies/ community	Gram panchayats in community-driven projects			
CSO	CSOs in formulation of community projects and for technology.			

Source: Authors' compilation

Mission for Integrated Development of Horticulture (MIDH)

MIDH promotes the holistic growth of the horticulture sector, including fruits, vegetables, root and tuber crops, mushrooms, spices, flowers, aromatic plants, coconut, cashew, cocoa, and bamboo. The Government of India's contribution to the total budget outlay is 85 per cent in all states, except the Northeastern and Himalayan states, where the Indian government's contribution is 100 per cent. The respective state governments contribute the rest of the budget. The mission

brings together several schemes such as the National Horticulture Mission (NHM), Horticulture Mission for North East and Himalayan States (HMNEH), and National Bamboo Mission (NBM) and institutions such as the National Bamboo Mission (NBM), Coconut Development Board (CDB), and Central Institute for Horticulture under one cluster to enable synergy in their operations and synchronicity in the funding and objectives.

Table A5: The table highlights the institutional set up for coherence at all three levels of governance in the MIDH policy

Stages/ Governance levels	Formulation/planning	Implementation	M&E	Impact evaluation
Centre	General Council (GC)			
	Executive Committee (EC)			
		Technical support group (TSG)		
				Bodies such as the Development Monitoring and Evaluation Office (DMEO) under NITI Aayog, ISEC, Global AgriSystem
State	State-level Executive Committee (SLECs)			
District		District Mission Committee (DMC)		
Local bodies /communities		PRI; communities (beneficiaries)		
CSOs		State agricultural universities (SAU), Indian Council of Agricultural Research (ICAR), institutes and universities recognised by University Grants Commission (UGC), krishi vigyan kendras (KVK)		

Source: Authors' compilation

Pradhan Mantri Matsya Sampada Yojana (PMMSY)

The scheme is important from the perspective of policy coherence on FLW as fisheries are an important source of food and nutrition security as well as traditional livelihoods. Thus, they require policy attention to enhance their sustainability.

PMMSY came into existence in 2020–2021 and is being implemented for a period of five years. The scheme has been allocated INR 20,050 crore in investments, with the centre's contribution being INR 9,407 crore, the state's contribution being

INR 4,880 crore, and the beneficiaries' contribution being INR 5,763 crore (Government of India 2020a; Government of India 2020e; Government of India 2020c). PMMSY covers all states and union territories of India (Government of India 2020b; Government of India 2020c). The scheme has two components – the Central Sector Scheme and the Centrally Sponsored Scheme (CSS). The CSS is further divided into a beneficiary-oriented and a non-beneficiary-oriented sub-component.

Table A6: The table highlights the institutional set-up for coherence at all three levels of governance in the PMMSY

Stages/ Governance levels	Formulation/planning	Implementation	M&E	Impact evaluation
Centre	General Council (GC)			
		Project Monitoring Unit (PMU) Project Monitoring And Evaluation Unit (PMEU)		
State/union territory	State-level approval and monitoring committee (SLAMC); union territory level approval and monitoring committee (UTLAMC)			
		State programme unit (SPU); union territory programme unit (UTPU)		
District	District-level committee (DLC)			
		District Programme Unit (DPU)		
Local bodies /community		Fisher Self-help Groups (SHGs)		
CSOs		End implementation agencies nominated by the State Fisheries Board		

Source: Authors' compilation

Pradhan Mantri Krishi Sinchayee Yojana – Watershed Development Component version 2.0 (WDC-PMKSY 2.0)

WDC-PMKSY 2.0 is an outcome of long-term integrated experiences on managing watersheds in India, which were initiated prior to Independence, with the conception of watershed management by the Soil Conservation Department in the 1970s. The National Watershed Development Project for Rainfed Areas was launched in 1991, and the guidelines on watershed development were published by the Ministry of Rural Areas in 1994. In 1999–2000, the Union Ministry of Finance, Government of India, announced the National Movement for Watershed Development. In 2003, the government further adopted the Hariyali guidelines to involve village communities through the panchayati raj institutions (PRIs) in the implementation of watershed projects including the Integrated Wasteland Development Programme (IWDP), Drought Prone Areas Programme (DPAP), and Desert Development Programme (DDP) (Government of India 2019a).

WDC-PMKSY 2.0 calls for a shift in approach – from mechanical to biological measures – in this next-generation watershed development strategy. Therefore, it emphasises the effective utilisation of rainwater and improving water productivity in rainfed and degraded lands, crop system diversification, risk management, and crop alignment. It focuses on the rejuvenation of springs and engagement in knowledge partnerships with institutions for capacity-building and innovation. The programme encourages diversification of the watershed economy through integrated farming systems with the inclusion of horticulture, afforestation, fisheries, animal husbandry, apiculture, and sericulture. It also recognises climate variability and change as a challenge that needs to be addressed through adaptation and mitigation measures (Government of India 2019a).

The programme focuses on integrated watershed management by valuing ecology, economy, and equity. In this regard, it promotes strengthening community-based local institutions for the sustainability of watersheds and improving the efficiency of watershed projects through cross-learning and the provision of incentives. It emphasises decentralisation, community

empowerment, and local participation in the planning process. Economically vibrant institutions such as FPOs are established and promoted for agri-business services and transaction efficiency.

WDC-PMKSY 2.0 operates under the aegis of the Department of Land Resources at the Ministry of Rural Development. The Integrated Watershed Management Programme (IWMP), which came into existence in 2009–10, was a major CSS. In 2015–2016, it was merged with the WDC of PMKSY.

Under WDC-PMKSY 2.0, the unit cost for watershed development projects is INR 22,000–28,000/ha depending on the area. Additional costs are addressed through convergence efforts. States and union territories are encouraged to effectively integrate relevant central and state schemes for comprehensive development. The Indian government approved the continuation of WDC-PMKSY as WDC-PMKSY 2.0 from 2021–2026, with a physical target of 49.50 lakh hectares and an estimated central financial outlay of INR 8,134 crore.

Watershed programmes, in various capacities, have been a part of India's water and soil conservation strategy even before Independence. In 1970, the Soil Conservation Department conceived the idea of watershed management for the multipurpose Damodar Valley Development Project. Drought proofing of ecologically sensitive areas through programmes such as DPAP and the DDP was also constituted in the 1970s. In the 1980s, the government launched other attempts to conserve and utilise natural resources to increase crop productivity and employment/income generation. Around this time, the Sukhomanjri project at the Sukhna lake in Chandigarh further sharpened the focus on watershed management, while adding several social dimensions to it. In the late 80s, community participation and involvement of voluntary organisations were also recommended. In 1989, the government initiated IWDP. A series of integrated projects were started in the 1970s and 1980s by ICAR and later by the Ministry of Rural Development and the Ministry of Environment and Forests.

Table A7: The table highlights the institutional set up for coherence at all three levels of governance in the WDC-PMKSY 2.0 policy

Stages/ Governance levels	Formulation/planning	Implementation	M&E	Impact evaluation
Centre	National Level Nodal Agency (NLNA) NRAA			
	National Steering Committee (NSC)			
			National Data Centre (NDC) and national portal	
State	State-level Nodal Agency (SLNA)			
	NRAA SLSC		State Data Cell (SDC)	Independent evaluating agencies empanelled by state
District	Watershed cell cum data centre (WCDC)			
	Zila parishad (ZP), District Planning Committee (DPC)	Project implementation agencies (PIA), Watershed Development Team (WDT)		
CSOs	Participation in committees, SLNA		As a part of PIA	
		Scientists and academicians, national-level institutions		
Local bodies/ communities	GP Watershed Committee (WC)			
	Other sub-district ¹ levels			
	SHGs	Farmer producer organisation (FPO); user groups; communities		

Source: Authors' compilation

Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS)

The policy targets the drivers of chronic poverty such as drought, deforestation, and soil erosion, and through this, maintains employment generation at a sustainable level (UNDP 2013). The work carried out under MGNREGS is unskilled manual work for rural development. The programme aims to ensure that employment is provided to unskilled workers (Government of India 2022d).

The act expanded its coverage from an initial set of 200 districts to 130 additional districts during 2007–2008 and encompasses all rural areas from 1 April 2008 onwards (Government of India 2012). The expansive coverage of the scheme is reflected in its coverage of 14.96 crore active workers (Government of India 2023h). A total of 11.37 crore households have benefitted from employment generation and 289.24 crore person-days of employment (till 15 December 2022) (Press Information Bureau 2022).

¹ Sub-district: Block, and also other sub-district levels locally known as taluk, mandal.

Table A8: The table highlights the institutional set up for coherence at all three levels of governance in the MGNREGS policy

Stages/ Governance levels	Formulation/planning	Implementation	M&E	Impact evaluation
Centre	Central Employment Guarantee Council (CEGC); Central Ground Water Board (CGWB)			
			NREGASoft	
State	State departments of rural development			
			State quality monitoring cell (SQMC)	
District		District Programme Coordinator (DPC)		
			District quality monitoring cell (DQMC)	
Local bodies /community	Gram sabha			
		GP		
CSO	At the grassroots level			

Source: Authors' compilation

National Mission for Clean Ganga – Namami Gange Programme (NMCG-NGP)

NMCG was established in 2011 to implement the National Ganga River Basin Authority's (NGRBA) objectives. There has been a transition in NMCG from being operated as the National Project Management Group (PMG) with assistance from the World Bank, to being registered as a society under the Societies Registration Act, 1860 (Government of India 2019b). In 2014, the administrative control of NMCG was transferred to the Ministry of Water Resources, River Development, and Ganga Rejuvenation. NGP came into existence in 2015. It works towards the objectives of the NGRBA through a set of interventions pertaining to wastewater treatment, solid waste management, riverfront management, maintaining environmental flows, afforestation, biodiversity conservation, and public participation (Government of India 2023i). The programme received 100 per cent central assistance for a period of five years (Government of India 2019b). In 2016, NGRBA was dissolved to constitute the National Council for Rejuvenation, Protection, and Management of River Ganga (referred to as

National Ganga Council) under the Environment (Protection) Act, 1986 (Government of India 2023i).

NMCG has a two-tier management structure comprising the governing council and executive committee. The executive committee accords approval for all projects up to INR 1,000 crore. Similar to the structure at the national level, State programme management groups (SPMGs) form the implementation wing of state Ganga committees. The structure is created to involve all the stakeholders on one platform for a holistic approach towards the cleaning and rejuvenation of the Ganga (Government of India 2023i).

The activities under the programme are **classified into entry level, medium term, and long term** depending on the period needed to implement them. Entry-level activities are intended to create an immediate visible impact and encompass cleaning the river's surface to deal with floating solid wastes, improving rural sanitation to prevent

solid and liquid pollution, and building toilets. Efforts include renovating, modernising, and building new crematoria, and ghats (banks) to improve the human–river connection. Medium-term activities are planned for implementation within five years to minimise

industrial and municipal pollutants flow in the river. Long-term activities are intended to be implemented within 10 years and include the determination of environmental flow,² raising water-use efficiency, and improving surface irrigation efficiency (Khanduja et al. 2023).

Table A9: The table highlights the institutional set up for coherence at all three levels of governance in the NMCG-NGP policy

Stages/ Governance levels	Formulation/planning	Implementation	M&E	Impact evaluation
Centre	National Ganga Council* Empowered Task Force		Central Pollution Control Board (CPCB), Central Water Commission (CWC), Ganga Task Force, Ganga Knowledge Centre, Quality Council of India (QCI)	
State		State Ganga committees		
	State project management groups (SPMGs)		State pollution control boards (SPCBs) as Ganga monitoring centres	
District		District Ganga committees		
			Ganga District Performance Monitoring System (GDPMS)	
Local bodies /community		ULB interacts with SPMGs		
		Public outreach activities with communities		
		Representation in district Ganga committees		
CSOs		Representation of local authority associations and environmentalists, NGOs, and SHGs in district Ganga committees		
*A group of secretaries from the following key ministries regularly met to develop a draft action plan for Ganga conservation: (a) Water Resources, River Development and Ganga Rejuvenation; (b) Environment, Forest & Climate Change; (c) Urban Development; (d) Drinking Water Supply and Sanitation; (e) Rural Development; (f) Tourism; and (g) Shipping.				

Source: Authors' compilation

² The concept of environmental flows describes the quantity, quality and timing of water flows required to sustain freshwater and estuarine ecosystems and the human livelihoods and well-being that depend on these ecosystems.

Atal Bhujal Yojana (ABY)

The key objective of ABY is to achieve sustainable groundwater management by promoting convergence among various ongoing schemes and actively involving local communities and stakeholders. This approach ensures the judicious utilisation of funds allocated by the central and state governments, leading to the long-term sustainability of groundwater resources. The convergence efforts also incentivise state governments to make appropriate investments, supported by robust data, scientific approaches, and community participation.

ABY has two major components. First, the institutional strengthening and capacity-building component aims to strengthen the groundwater governance mechanism in participating states by focusing on training and capacity-building as well as through M&E. Second is the incentive component, under which state agencies receive funds as an incentive or reward for promoting convergence among different schemes of the central and state governments. The funds support sustainable groundwater management through community participation.

The nodal agency for the ABY is the Department of Water Resources, River Development, and Ganga Rejuvenation under the Ministry of Jal Shakti. The scheme follows a four-pronged strategy described below.

1. Decision support tools: A management information system (MIS) streamlines programme implementation across participating states. It facilitates water security planning, water budgeting, groundwater monitoring, and progress reporting. The MIS is widely utilised by implementing agencies and provides access to information for beneficiary communities.
2. Strengthening community-based institutions: Incentives under ABY support the strengthening of enabling institutions and the establishment of a robust information base for participatory planning and the implementation of groundwater management interventions. This approach deviates from traditional methods and promotes sustainable groundwater management on a larger scale.
3. Water-use efficiency and recharge: The programme promotes volumetric metering, the use of real-time data systems, and awareness of sound groundwater governance. It encourages on-ground actions driven by community ownership and the judicious management of water resources.
4. Fiscal decentralisation: ABY aligns with the government's objective of fiscal decentralisation. Unlike the centrally implemented Ground Water Management and Regulation (GWMR) Scheme, funds flow from the central government to the states and subsequently to appropriate implementation levels (districts, blocks, GPs, beneficiaries). This shift enhances ownership, uptake, and implementation of aquifer management plans (AMPs).

Table A10: The table highlights the institutional set up for coherence at all three levels of governance in the ABY policy

Stages/ Governance levels	Formulation/planning	Implementation	M&E	Impact evaluation
Centre	National Programme Management Unit (NPMU), Central Ground Water Board (CGWB)			
	National-level steering committee (NLSC) verification agency (TPGVA)		Third-party government verification agency (TPGVA)	
State	Department dealing with groundwater			
	SLSC, PIA			
		State programme management unit (SPMU)		
District	District programme management unit (DPMU)			
		District implementation partners (DIP)		
CSO		State institutes of rural development (SIRD), state institutes for agriculture management (SIMA), Rajiv Gandhi National Ground Water Training and Research Institute (RGNGWTRI), National Institute of Rural Development and Panchayati Raj (NIRDPR), other NGOs		
Local bodies /community	Gram Panchayat (GP), Water user association (WUA)			
		Community volunteer	Community	

Source: Authors' compilation

6. External consistencies with SDGs

High Positive Impact
Medium Positive Impact
Neutral Impact
No Response

Table A11: The table highlights the external consistencies with SDGs for RKVY-PDMC policy

One CGIAR impact area	SDG	Targets	RKVY-PDMC	Notes from the consultations on the scores
Nutrition, health, and food security	2: Zero hunger	2.1		The policy has a highly positive impact on SDG 6.3, which pertains to improving water quality by reducing pollution. This is attributed to irrigation efficiency through micro-irrigation, which could reduce agricultural run-off. The stakeholder consultation and literature analysis highlighted that the policy has a medium positive impact on SDG 2.1 and SDG 2.2. This is because the scheme incentivises crop diversification and promotes micro-irrigation, thereby encouraging the optimisation of fertiliser usage through fertigation. This also improves the quality of the crops being cultivated. Evidence of improved farm productivity in regions of Gujarat (Saurashtra), Maharashtra (Vidarbha), and Rajasthan in the form of the ability to produce two crops per year was cited.
		2.2		
	3: Good health and well-being	3.1		
		3.2		
	6: Clean water and sanitation	6.3		
Poverty reduction, livelihood, and jobs	1: No poverty	1.1		The policy has a direct medium positive impact on SDG 1.1 'ending poverty in all forms'. During the consultation, it was highlighted that agriculture is a large domain to address the issues of poverty. Micro-irrigation is only one of the components within the larger domain. However, it can also contribute immensely by enhancing farm productivity, which could further enhance farmers' income and livelihoods.
		1.2		
	5: Gender equality	5		
	8: Decent work and economic growth	8.5		
	10: Reduced inequality	10.2		
Climate adaptation and GHG reduction	1: No poverty	1.5		In this thematic area, stakeholder consultations highlighted that the scheme has made a highly positive and direct impact across various SDGs. Specifically, in reference to SDG 1.5, on building the resilience of the poor, the micro-irrigation system promotes water-use efficiency, which could eventually act as a shock absorber for climate-driven water scarcity.
	2: Zero hunger	2.4		
	13: Climate action	13.1		
	15: Life on land	15.1		
		15.2		
		15.3		
Environmental health and biodiversity	2: Zero hunger	2.5		The impact of the policy has been highly positive on SDG 2.5, which is about maintaining the genetic diversity of seeds and cultivated plants. During the consultation, it was highlighted that "under the scheme, there is provision for incentivising crop diversification, which can be remotely related to the conservation of genetic diversity. So, it might be an indirect but highly positive impact."
	6: Clean water and sanitation	6.3		
		6.6		
	14: Life below water	14.1		
		14.2		

Gender equality, youth, and social inclusion	2: Zero hunger	2.3		In this thematic area, the policy was found to have a highly positive impact on SDG 5a, which refers to reforms undertaken to give women equal rights to economic resources and to own and control land and other property. It has been inherently reflected within the scheme guidelines itself, which mandates that 30 per cent of beneficiaries should have landholding power under the name of women. SDG 2a, which is about doubling the agricultural productivity and incomes of small-scale farmers, can be linked to the incentive to diversify crops.
	5: Gender equality	5a		
		5b		
	10: Reduced inequality	10.2		
		10.3		
	6: Clean water and sanitation	6.2		

Source: Authors' compilation

Table A12: The table highlights the external consistencies with SDGs for MIDH policy

One CGIAR impact area	SDG	Targets	MIDH	Notes from the consultations on the scores
Nutrition, health, and food security	2: Zero hunger	2.1		The responses from stakeholders were used to identify linkages with various SDG impact areas. In the nutrition, health, and food security area, highly positive linkages were identified with SDGs 2.1 and 2.2, which speak about ending hunger and malnutrition for all. This was due to the nutritional potential of horticultural products if involved in diets across the socio-economic strata of a population.
		2.2		
	3: Good health and well-being	3.1		
		3.2		
	6: Clean water and sanitation	6.3		
Poverty reduction, livelihood, and jobs	1: No poverty	1.1		Under the poverty reduction, livelihoods, and jobs thematic area, highly positive linkages were observed with SDGs 1.1 and 10.2, which speak about ending extreme poverty and social, economic, and political inclusion for all. This was observed by stakeholders who said that “better food availability and improved incomes are possible for the poorest sections of the population if landless farmers and labourers are included as participants and educational components on the use of horticultural products in diets is added to the mission.”
		1.2		
	5: Gender equality	5a		
	8: Decent work and economic growth	8.5		
	10: Reduced inequality	10.2		
Climate adaptation and GHG reduction	1: No poverty	1.5		Under the climate change adaptation and mitigation vertical, highly positive linkages were identified with SDGs 1.5, 2.4, and 13.1. These speak about building the resilience of the poor and vulnerable, decreasing their exposure and vulnerability to climate-related, economic, social, and environmental shocks and disasters; ensuring sustainable food production and implementing resilient agricultural practices that increase production and productivity; maintaining ecosystems; strengthening the capacity for adaptation to climate change, extreme weather, drought, floods; improving land and soil quality; and strengthening resilience and adaptive capacity to climate-related hazards and natural disasters. This was identified due to components such as organic farming and precision nutrient management within the mission areas (Shivalingaiah Ganesamoorthi and Arundhati 2022).
	2: Zero hunger	2.4		
	13: Climate action	13.1		
	15: Life on land	15.1		
		15.2		
		15.3		

Environmental health and biodiversity	2: Zero hunger	2.5		Under the environmental health and biodiversity theme, a positive linkage was seen with SDG 2.5, wherein stakeholders identified that the potential to cultivate local and resilient genetic varieties of horticultural crops, especially in the Northeast, could boost the genetic diversity of plants and seeds in the region.
	6: Clean water and sanitation	6.3		
		6.6		
	14: Life below water	14.1		
		14.2		
Gender equality, youth, and social inclusion	2: Zero hunger	2.3		Under the gender equality, youth and social inclusion theme, a positive linkage was seen with SDG 5b, which pertains to using technology to achieve the empowerment of women. The stakeholders assessed this as a “product of the technological demonstration component” of the MIDH.
	5: Gender equality	5a		
		5b		
	10: Reduced inequality	10.2		
		10.3		
	6: Clean water and sanitation	6.2		

Source: Authors' compilation

Table A13: The table highlights the external consistencies with SDGs for the PMMSY policy

One CGIAR impact area	SDG	Targets	PMMSY	Notes from the consultations on the scores
Nutrition, health, and food security	2: Zero hunger	2.1		The linkages between PMMSY and the SDGs have been established to a limited extent and require further exploration to improve our understanding of external consistencies. The objectives of PMMSY have a clear linkage to improving nutrition, health, and food security, but the stakeholder consultation indicated that it has no positive impact as of now. About SDG2.1, the stakeholder consultation revealed that this is primarily due to the “prohibitively high cost of fishes in local markets, which makes them out of reach for the poorest and the most malnourished groups in the population.” If this situation could be changed by reducing the perishability of produce by establishing a public procurement aggregator for fisheries, a positive linkage could be established to the SDG 2.1
		2.2		
	3: Good health and well-being	3.1		
		3.2		
	6: Clean water and sanitation	6.3		
Poverty reduction, Livelihood, and jobs	1: No poverty	1.1		Under the poverty reduction, livelihoods, and jobs theme, highly positive linkages were seen with SDG 5a, while medium positive linkages were observed with SDGs 1.1 and 10.2, which look at the eradication of extreme poverty and the promotion of social, economic, and political inclusion. The stakeholders mentioned that “entrepreneurial SHG groups can increase the incomes of members.”
		1.2		
	5: Gender equality	5a		
	8: Decent work and economic growth	8.5		
	10: Reduced inequality	10.2		

Climate adaptation and GHG reduction	1: No poverty	1.5		Under the climate change adaptation and mitigation thematic area, a highly positive linkage was posited with SDG 2.4, which refers to ensuring sustainable food production, resilient agricultural practices that increase productivity and production, and strengthening the capacity for adaptation to climate change, drought, flooding, and other disasters. This was because activities like pond rejuvenation and mangrove cultivation along fisher folk houses were seen as having important cross-linkages for agricultural resilience and climate change adaptation. Stakeholders also referred to the seaweed cultivation priority as a sustainable agricultural practice in the scheme.
	2: Zero hunger	2.4		
	13: Climate action	13.1		
	15: Life on land	15.1		
		15.2		
		15.3		
Environmental health and biodiversity	2: Zero hunger	2.5		In the environmental health and biodiversity area, highly positive linkages were seen with SDGs 6.6 and 14.2 on protecting and conserving water-related ecosystems and sustainably managing marine ecosystems. Stakeholders also saw a potential to link pond rejuvenation, seaweed cultivation and achieving groundwater restoration and afforestation via PMMSY.
	6: Clean water and sanitation	6.3		
		6.6		
	14: Life below water	14.1		
		14.2		
Gender equality, youth, and social inclusion	2: Zero hunger	2.3		Under the thematic area of gender equality, youth, and social inclusion, the SDG 10.2 on social, economic, and political inclusion of all saw a positive linkage. This was identified by stakeholders who asserted that linking fisheries with female employment generation was important, as it had a high potential for involvement and leadership by female-led organisations like SHGs in implementing the scheme in local communities.
	5: Gender equality	5a		
		5b		
	10: Reduced inequality	10.2		
		10.3		
	6: Clean water and sanitation	6.2		

Source: Authors' compilation

Table A14: The table highlights the external consistencies with SDGs for WDC-PMKSY 2.0 policy

One CGIAR impact area	SDG	Targets	WDC-PMKSY 2.0	Notes from the consultations on the scores
Nutrition, health, and food security	2: Zero hunger	2.1		Experts highlighted how the WDC scheme links to the SDGs. The impact on nutrition, health, and food security is expected to be neutral as there is no special provision to address the needs of vulnerable sections while the watershed programme is expected to improve food security; further, there is no relevant impact on neonatal or maternal mortality. The WDC scheme is also not expected to address malnutrition. A study on four watershed villages in Telangana showed that while watershed interventions led to diversified cropping patterns and consequently increased the consumption of vegetables, such interventions did not lead to healthy anthropometric indices for children.
		2.2		
	3: Good health and well-being	3.1		
		3.2		
	6: Clean water and sanitation	6.3		

Poverty reduction, Livelihood, and jobs	1: No poverty	1.1		In the area of poverty reduction, livelihoods, and jobs, the WDC scheme is expected to have a medium positive impact on eradicating poverty, reducing the number of people living in poverty, and enabling inclusion. The WDC scheme is not expected to improve women's economic and financial conditions as the SHGs proposed as a part of WDC are limited to savings and do not have the scope to challenge and change inequities. WDC also does not boost productive employment.
		1.2		
	5: Gender equality	5a		
	8: Decent work and economic growth	8.5		
	10: Reduced inequality	10.2		
Climate adaptation and GHG reduction	1: No poverty	1.5		In terms of climate change mitigation and adaptation, the WDC scheme is expected to have a high positive impact on building resilience and reducing exposure for the vulnerable. Sustainable food production and productivity and sustainable forest management are also expected to be boosted substantially through these programmes.
	2: Zero hunger	2.4		
	13: Climate action	13.1		
	15: Life on land	15.1		
		15.2		
		15.3		
Environmental health and biodiversity	2: Zero hunger	2.5		The WDC scheme is expected to have a medium positive impact on the protection and restoration of water-related ecosystems and none on other SDGs related to environmental health and biodiversity.
	6: Clean water and sanitation	6.3		
		6.6		
	14: Life below water	14.1		
		14.2		
Gender equality, youth, and social inclusion	2: Zero hunger	2.3		SDGs related to gender equality, youth and social inclusion are also expected to be substantially and positively affected by the scheme. Agricultural productivity and incomes for small-scale producers and women are expected to increase with the policy. The scheme is also expected to have a medium positive impact on promoting social, economic, and political inclusion and on ensuring equal opportunities.
	5: Gender equality	5a		
		5b		
	10: Reduced inequality	10.2		
		10.3		
	6: Clean water and sanitation	6.2		

Source: Authors' compilation

Table A15: The table highlights the external consistencies with SDGs for MGNREGS policy

One CGIAR impact area	SDG	Targets	MGNREGS	Notes from the consultations on the scores
Nutrition, health, and food security	2: Zero hunger	2.1		There are high and medium positive impacts in the thematic area of nutrition, health, and food security. The stakeholder consultations revealed the high positive impact of the MGNREGS on SDG2.1, which pertains to ending hunger and ensuring access to safe and nutritious food. This is because of the contribution of the scheme to water and livelihood security and its positive influence on land productivity for food production. There is a medium positive impact on SDG 2.2, which pertains to ending all forms of malnutrition, implicitly linked to livelihood security through job cards. For SDG 3.1, which aims to reduce global maternal mortality, a medium positive impact is seen because of the active involvement of anganwadi centres for women and child development. A proportion of these centres are constructed through MGNREGS in convergence with the Integrated Child Development Services (ICDS) (Government of India 2016).
		2.2		
	3: Good health and well-being	3.1		
		3.2		
	6: Clean water and sanitation	6.3		
Poverty reduction, livelihood, and jobs	1: No poverty	1.1		In the thematic area of poverty reduction, livelihoods, and jobs, there is a high positive impact on SDG 1.1, which pertains to eradicating extreme poverty for all people through employment guarantees. Stakeholders recognise that significant progress has been made in addressing SDG 5a through MGNREGS in some of the states, such as Sikkim. This is because of the enhanced efforts to improve gender equality and empower women through equal access to economic resources. To substantiate, 50 per cent of the total PRI representatives have to be elected women representatives (Government of India 2020e). MGNREGS has a high positive impact on SDG 10.2, which pertains to empowering and promoting social, economic, and political inclusion of all, as the key focus of the scheme is targeted towards the economically marginalised sections.
		1.2		
	5: Gender equality	5a		
	8: Decent work and economic growth	8.5		
	10: Reduced inequality	10.2		
Climate adaptation and GHG reduction	1: No poverty	1.5		In the climate change adaptation and mitigation thematic area, the stakeholders recognise the significant impact of the MGNREGS on SDG 1.5 due to the construction of climate resilient assets to reduce the exposure of the vulnerable to climate change. The contribution of MGNREGS to SDG 2.4 is through implementing practices that protect crops from climate-related extreme events and improve land and soil quality. The scheme also makes a significant contribution to SDG 13.1, by mitigating the impact of droughts, water scarcity, and effective water drainage systems by strengthening resilience and adaptive capacity to climate-related extreme events.
	2: Zero hunger	2.4		
	13: Climate action	13.1		
	15: Life on land	15.1		
		15.2		SDG 15.1 on conservation, restoration, and the sustainable use of terrestrial and inland freshwater ecosystems is supplemented through MGNREGS activities connected to the revival of dried-up lakes, aquifer recharge, and the execution of the Mission Amrit Sarovar. SDG 15.2 on promoting the implementation of the sustainable management of all types of forests and halting the degradation of land is positively impacted to a moderate level through the natural resources management work targeted towards the restoration of degraded lands. For SDG 15.3, there is a high positive impact, wherein the emphasis is on land terracing work to prevent soil erosion and the inclusion of work that aims to restore degraded lands.
		15.3		

Environmental health and biodiversity	2: Zero hunger	2.5		In the thematic area of environmental health and biodiversity, MGNREGS has a medium positive impact on SDG 6.3 through the creation of assets for improving water quality in alignment with the Swachh Bharat Mission.
	6: Clean water and sanitation	6.3		
	14: Life below water	14.1		
		14.2		
Gender equality, youth, and social inclusion	2: Zero hunger	2.3		MGNREGS, in the context of doubling the agricultural productivity and incomes of small-scale food producers, including women (SDG 6.3), can be inferred to have a high positive impact. This highlights the importance of gender equality, youth, and social inclusion in achieving water security, enhancing agricultural productivity, and providing direct income support for women, small-scale farmers, and those with marginal land holdings. MGNREGS's implementation takes place through "mates" ²³ and Gram Rozgar Sahayak in states like Sikkim. The mates and Gram Rozgar Sahayak are women who rely on mobile phones and applications for information management and communication purposes. This reflects the medium positive impact of MGNREGS on SDG 5b (enhancing the use of enabling technology, in particular information and communications technology, to promote the empowerment of women).
	5: Gender equality	5a		
		5b		
	10: Reduced inequality	10.2		
		10.3		
	6: Clean water and sanitation	6.2		

Source: Authors' compilation

Table A16: The table highlights the external consistencies with SDGs for NMCG-NGP policy

One CGIAR impact area	SDG	Targets	NMCG-NGP	Notes from the consultations on the scores
Nutrition, health, and food security	2: Zero hunger	2.1		There are highly positive, medium positive, and neutral impacts in the thematic area of nutrition, health, and food security. The stakeholder consultations revealed that there are encouraging results with regards to linkages between NMCG-NGP and SDG2.1 on achieving food security by ending hunger and providing access to all people to safe, nutritious, and sufficient food all year round. There is neutral impact on SDG 2.2 on ending all forms of malnutrition because "food-land-water linkages in this regard are not being looked into and managed well" (per water expert).
		2.2		
	3: Good health and well-being	3.1		
		3.2		
	6: Clean water and sanitation	6.3		
Poverty reduction, livelihood, and jobs	1: No poverty	1.1		In the thematic area of poverty reduction, livelihoods, and jobs, there is a medium positive impact on SDG 1.1 in terms of eradicating extreme poverty for all people through "improved water availability for sustaining water dependent livelihoods". There is a medium positive linkage with SDG 1.2 on reducing the proportion of people living in poverty by half because of the lack of water-use efficiency.
		1.2		
	5: Gender equality	5a		
	8: Decent work and economic growth	8.5		
	10: Reduced inequality	10.2		

3. A worksite supervisor in MGNREGS

Climate adaptation and GHG reduction	1: No poverty	1.5		In the climate change adaptation and mitigation thematic area, NMCG-NGP was found to have a medium positive impact on SDG 2.4. The SDG refers to ensuring sustainable and resilient agricultural practices that increase productivity and production and strengthen the capacity for adaptation to climate change, droughts, flooding, and other disasters. The reason for the medium positive impact is poor water-use efficiency, which is a serious concern and needs to be considered a high priority. With regard to SDG 15.1 on ensuring the conservation, restoration, and sustainable use of terrestrial and inland freshwater ecosystems and their services, NMCG-NGP was found to have a medium positive impact because of sporadic and inconsistent action. There is good evidence of the medium positive impact of NMCG-NGP on SDG 15.2 and 15.3, which pertain to promoting the implementation of the sustainable management of all types of forests and combating desertification and restoring degraded land and soil, respectively.
	2: Zero hunger	2.4		
	13: Climate action	13.1		
	15: Life on land	15.1		
		15.2		
		15.3		
Environmental health and biodiversity	2: Zero hunger	2.5		In the environmental health and biodiversity area, NMCG-NGP was seen to have a high positive impact on SDG 2.5 because of the strong evidence on the maintenance of genetic diversity in the states where the Ganga flows. A medium positive impact of the NMCG-NGP is noted on SDG 6.3, which addresses improving water quality by reducing pollution. This is mainly because of the failure to realise behavioural change in people in terms of minimising the impact of their activities on the river. NMCG-NGP has a neutral impact on SDG 6.6, which pertains to the protection and restoration of water-related ecosystems, because of limited policy action in this regard.
	6: Clean water and sanitation	6.3		
		6.6		
	14: Life below water	14.1		
		14.2		
Gender equality, youth, and social inclusion	2: Zero hunger	2.3		In the thematic area of gender equality, youth, and social inclusion, NMCG-NGP has a high positive impact on SDG 6.2, which pertains to achieving access to adequate and equitable sanitation and hygiene for all. There is excellent evidence on this per the stakeholder consultations. As a part of NMCG-NGP, water, sanitation, and hygiene (WASH) programmes are being implemented to promote the cause of Ganga rejuvenation in schools located along the Ganga river basin in association with Rotary International (Government of India 2019b). NMCG-NGP has a medium positive impact on SDG2.3, which pertains to the doubling of agricultural productivity and the incomes of small-scale food producers including women; SDG 5b refers to enhancing the use of enabling technology for promoting women empowerment; SDG 10.2 aims to empower and promote the social, economic, and political inclusion of all; and SDG 10.3 promotes ensuring equal opportunity and reducing inequalities of outcomes. These are crucial aspects of the FLW nexus which require a proactive approach.
	5: Gender equality	5a		
		5b		
	10: Reduced inequality	10.2		
		10.3		
	6: Clean water and sanitation	6.2		

Source: Authors' compilation

Table A17: The table highlights the external consistencies with SDGs for ABY policy

One CGIAR impact area	SDG	Targets	ABY	Notes from the consultations on the scores
Nutrition, health, and food security	2: Zero hunger	2.1		Experts highlighted how ABY links to the SDGs. The impact on nutrition, health, and food security is expected to be highly positive in terms of reducing hunger and ensuring access by all, albeit indirectly. The focus on interventions related to demand-side management and crop diversification (like incentivising millets and other drought-resilient crops) and sustainable agriculture will boost nutritional sufficiency for the entire population.
		2.2		
	3: Good health and well-being	3.1		
		3.2		
	6: Clean water and sanitation	6.3		
Poverty reduction, livelihood, and jobs	1: No poverty	1.1		In the area of poverty reduction, livelihoods, and jobs, the ABY scheme is expected to improve women's economic and financial condition, especially because of the provision to mandatorily include 33 per cent women in the preparation of water security plans (WSPs). The ABY scheme is also expected to have a medium positive impact on the SDG related to social inclusion as there are provisions to include vulnerable groups through community mobilisation.
		1.2		
	5: Gender equality	5		
	8: Decent work and economic growth	8.5		
	10: Reduced inequality	10.2		
Climate adaptation and GHG reduction	1: No poverty	1.5		In terms of climate change mitigation and adaptation, the scheme is expected to have a high positive impact on sustainable food production and productivity through interventions such as agricultural demand-side management, natural farming, precision agriculture, and micro-irrigation, which boost farmers' capacity for adaptation to climate change and productivity. Further, the scheme is directly linked to ensuring conservation, restoration, and the sustainable use of terrestrial and inland freshwater ecosystems and their services and is therefore highly impactful.
	2: Zero hunger	2.4		
	13: Climate action	13.1		
	15: Life on land	15.1		
		15.2		
		15.3		
Environmental health and biodiversity	2: Zero hunger	2.5		In terms of the SDGs related to environmental health and biodiversity, the scheme is expected to have a high positive impact on the protection and restoration of water-related ecosystems as the interventions are directly related and have a medium positive impact on improving water quality.
	6: Clean water and sanitation	6.3		
		6.6		
	14: Life below water	14.1		
		14.2		

Gender equality, youth, and social inclusion	2: Zero hunger	2.3		Gender equality, youth, and social inclusion related SDGs are also expected to be substantially and positively affected by the scheme. The scheme is also expected to have a high positive impact on doubling agricultural productivity; giving women equal rights and access; and promoting social, economic, and political inclusion. Further, the scheme has a medium positive impact on ensuring equal opportunities, achieving access to adequate and equitable sanitation and hygiene for all, and finally, enhancing the use of technology to promote women empowerment.
	5: Gender equality	5a		
		5b		
	10: Reduced inequality	10.2		
		10.3		
	6: Clean water and sanitation	6.2		

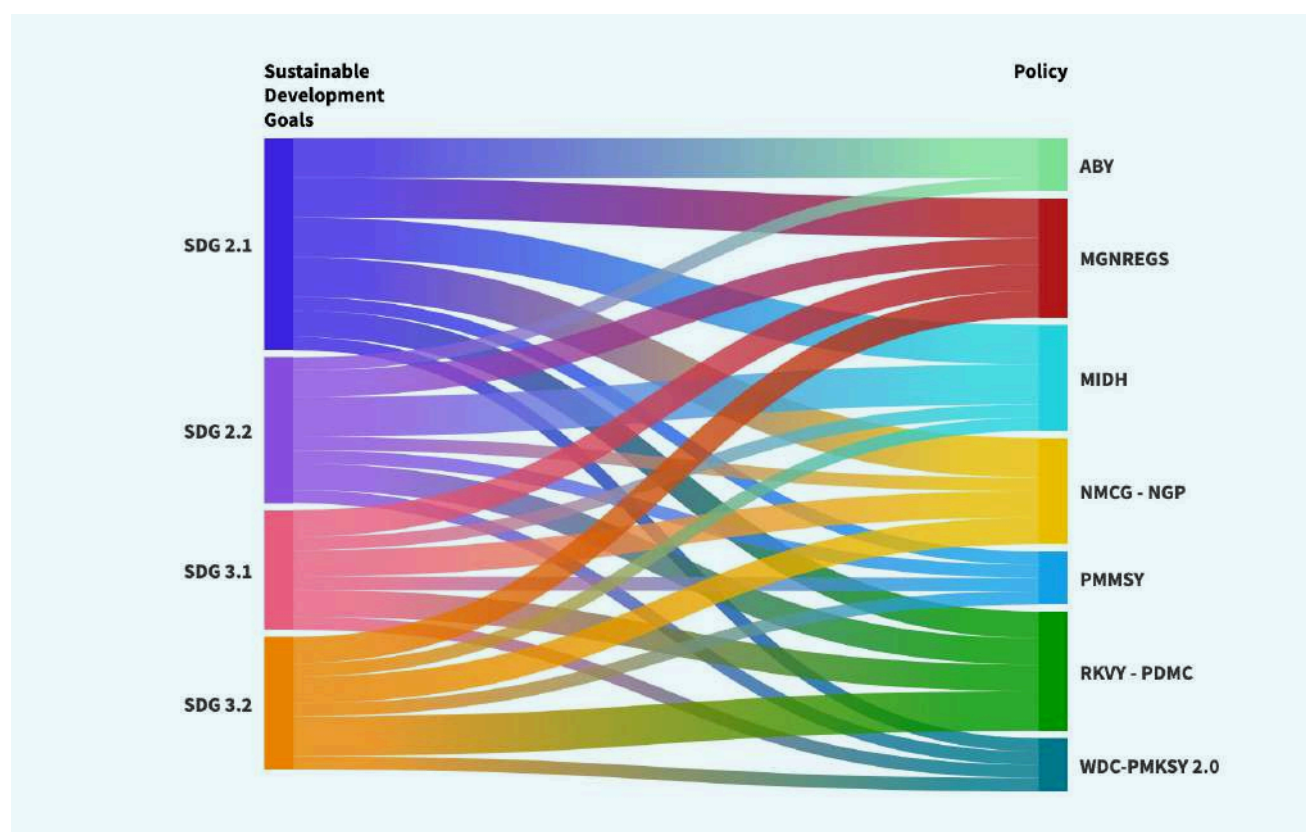
Source: Authors' compilation

Key Findings on External Consistency

Policies such as MGNREGS and RKVY-PDMC have the most linkages to SDGs advancing nutrition, health, and food security, and their impacts are documented. However, the potential impacts of other policies need to be researched. Among the four SDGs, 2.1 has the highest association with policies and 2 has the second-highest association. This is because of the targeted contribution of these policies to improving the access of the poor and

people in vulnerable situations to safe, nutritious, and sufficient food all year round. Further, the policies to some extent include the nutritional needs of women of diverse socio-economic backgrounds. There is an emerging opportunity to document the impacts of policies such as PMMSY in terms of achieving nutritional security through fisheries, an area in which sufficient evidence of the positive impact is lacking at present.

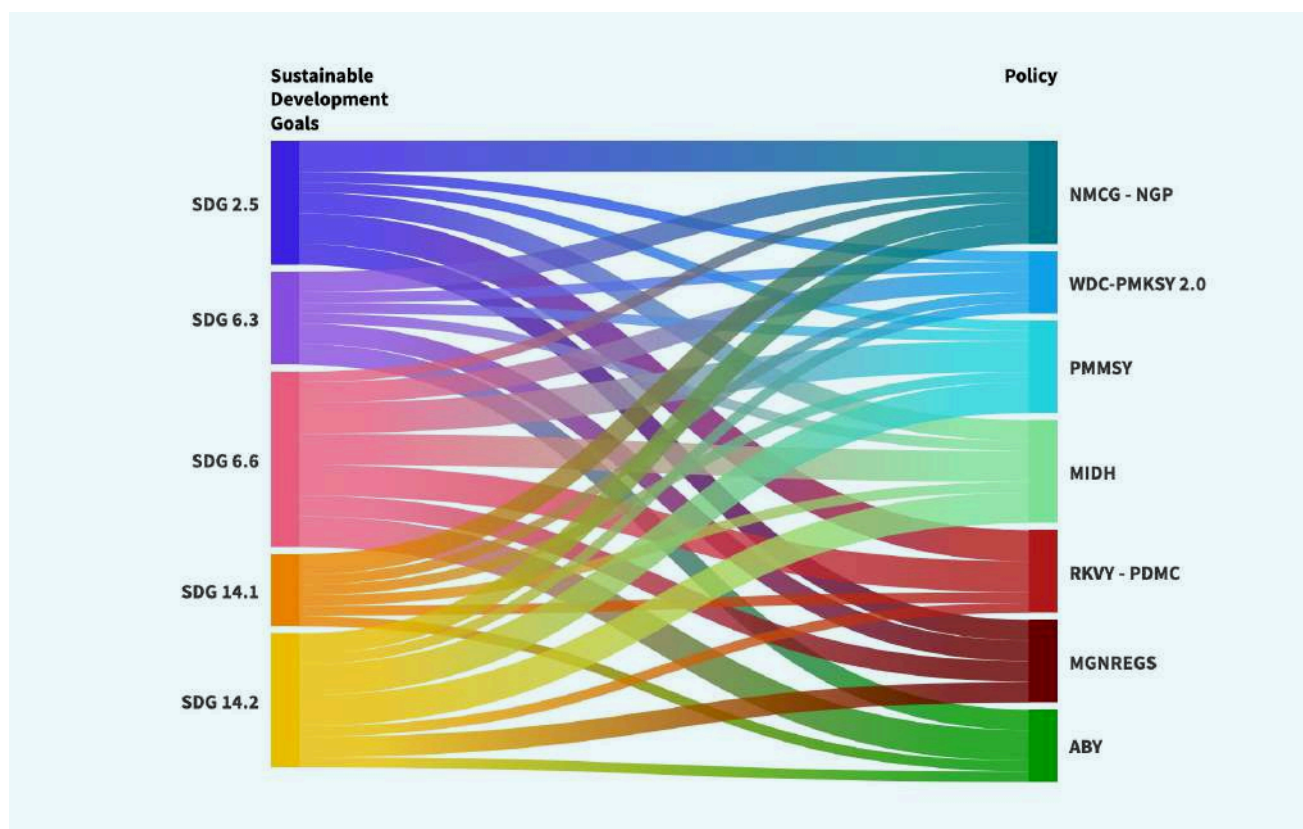
Figure A1: High and medium positive impacts and neutral impact of the policies on the SDGs related to nutrition, health, and food security



Source: Authors' analysis

Note: In the Sankey charts, the thickest strand reflects high positive impact, while the thinnest shows neutral impact

Figure A2: High and medium positive impacts and neutral impact of the policies on the SDGs related to environmental health and biodiversity

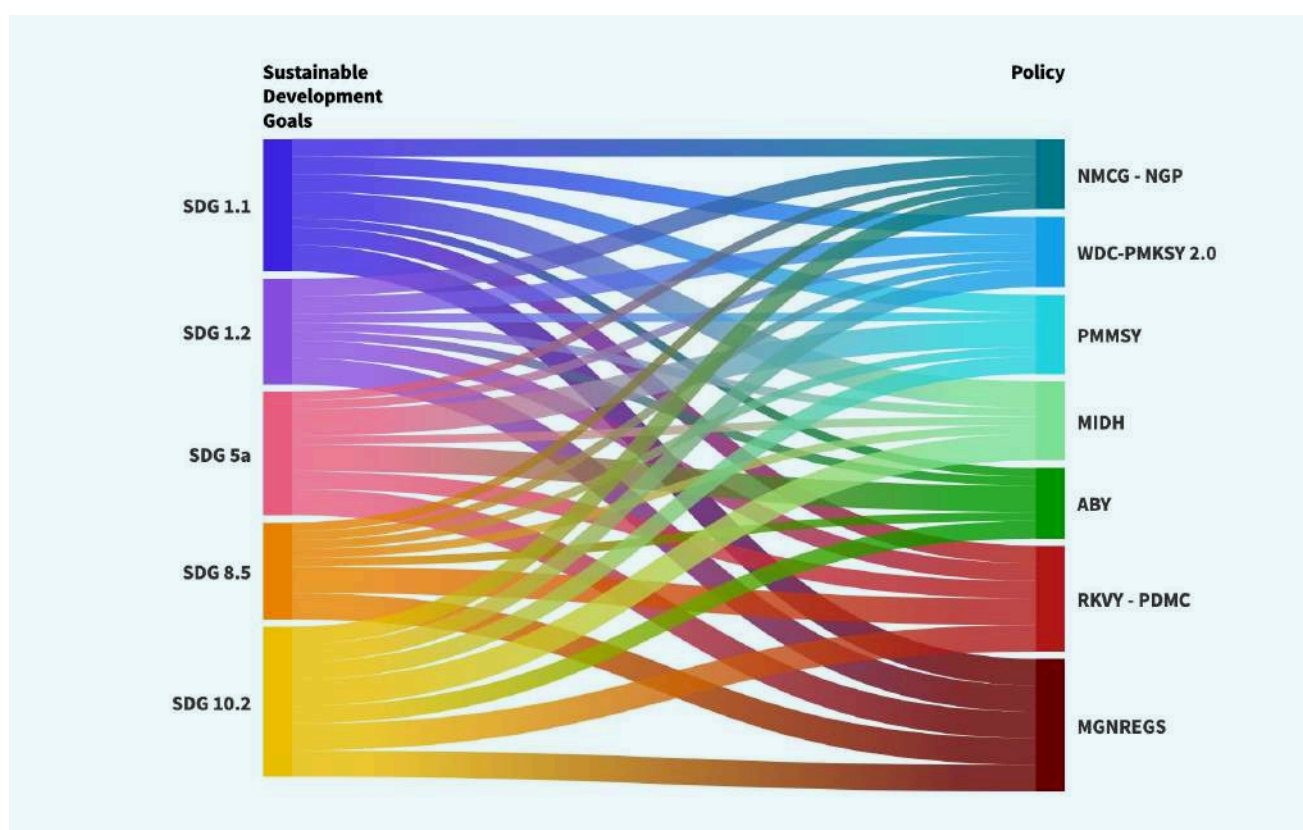


Source: Authors' analysis

Policies such as NMCG-NGP, MIDH, and PMMSY reflect environmental health and biodiversity conservation the most. The policy recommendation emphasises the need to map out diverse impacts on issues of environmental health and biodiversity for a holistic understanding. The protection and restoration of water-related ecosystems and the sustainable management and protection of coastal ecosystems to avoid negative impacts and build their resilience to achieve healthy and productive systems are the embedded themes in the policies. SDG 6.6 has the highest and SDG 14.2 has the second-highest association with the policies. To substantiate further, these linkages are through the thematic focus on resource-use efficiency, biodiversity conservation in the context of River Ganga (NMCG-NGP), horticulture (MIDH), and fisheries (PMMSY). Further, biodiversity is an umbrella category in which riverine biodiversity is crucial for NMCG-NGP; fish biodiversity for PMMSY and NMCG-NGP; and agrobiodiversity for MIDH.

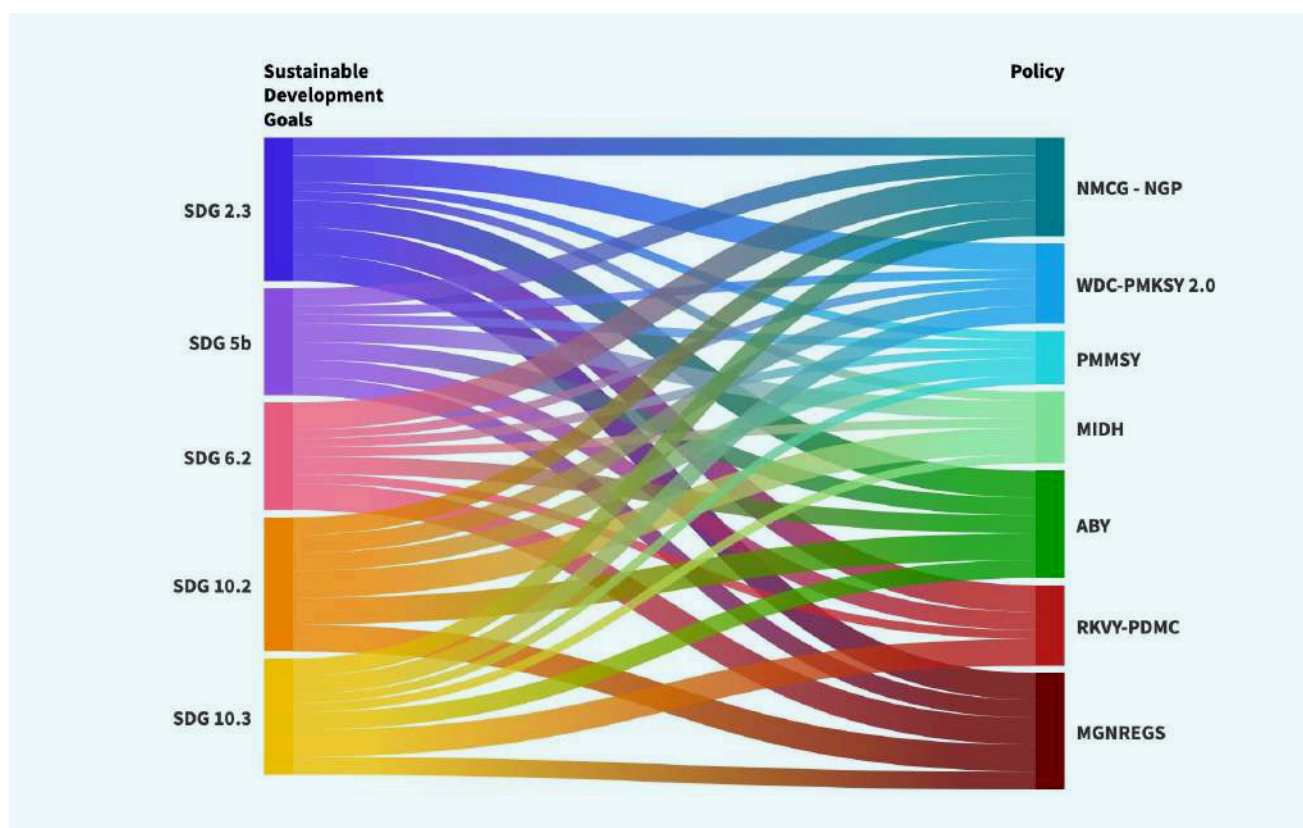
Policies such as MGNREGS and RKVY-PDMC are most prominent for poverty reduction, livelihoods, and jobs due to their focus on sustainable livelihoods and rural development. The recommendation is to refer to these as models for other policies to enhance poverty reduction, livelihoods, and jobs. MGNREGS enables this by focusing on extreme poverty by providing guaranteed employment and supporting minor irrigation to reduce farmers' vulnerability to water scarcity and climate change. Among the five SDGs, 10.2 has the highest and 1.1 has the second-highest association with poverty reduction, livelihoods, and jobs. This emanates from the focus of the policies on the social and economic inclusion of vulnerable sections. The forms of vulnerabilities premised on sex, disability, race, ethnicity, origin, and economic or other status are recognised. The lack of livelihood opportunities and persistent poverty as an outcome of these identity-based inequalities is being addressed.

Figure A3: High and medium positive impacts and neutral impact of the schemes on the SDGs related to poverty reduction, livelihoods, and jobs



Source: Authors' analysis

Figure A4: High and medium positive impacts and neutral impact of the schemes on the SDGs related to gender equality, youth, and social inclusion

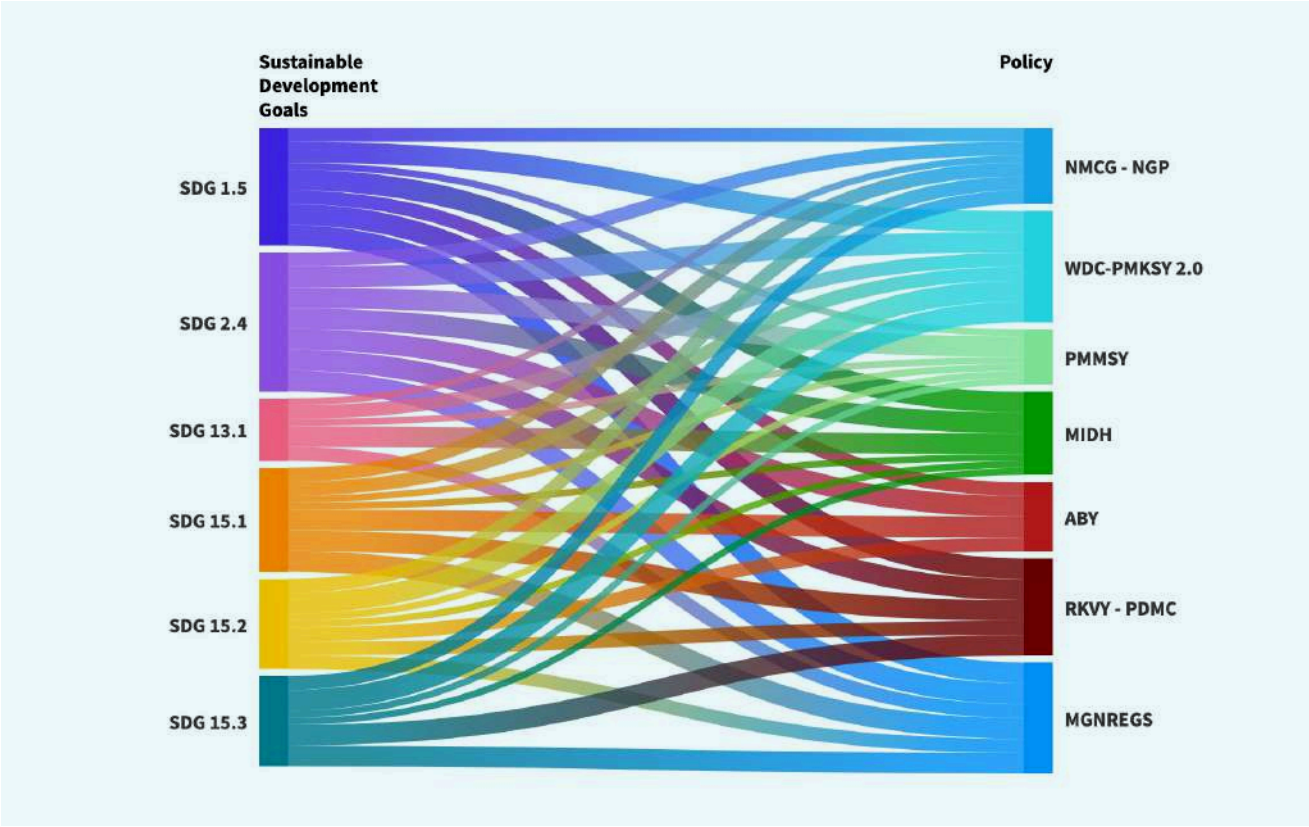


Source: Authors' analysis

Policies such as MGNREGS and ABY have a relatively more pronounced influence on gender equality, youth, and social inclusion, and the mechanism followed is allocating dedicated quotas for the most vulnerable. The recommendation is to go beyond the dedicated quota for advancing gender equality, youth, and social inclusion. This is primarily because they are community-led schemes, and intra-community social diversity and identity-based inequalities are represented to a larger extent. SDGs 2.3 and 10.2 have a deeper association with the policies. The alignment is with the doubling of agricultural productivity and the incomes of small-scale food producers. Small-scale food producers include women, indigenous peoples recognised as ST in India, and fishers. The schemes build the social sustainability of the local economy by creating non-farm employment and opportunities for value addition. Further, the social and economic inclusion of diverse vulnerable groups is taken into consideration by establishing a set share for marginalised groups among beneficiaries.

Policies such as MGNREGS and WDC-PMKSY2.0 reflect the largest impact on climate change adaptation and mitigation. However, the recommendation is to provide support for translating knowledge on intersectoral linkages between FLW sectors into climate actions. Natural resource management activities under MGNREGS provide an important base as a significant proportion of the permissible work involves water, agriculture, and allied activities. WDC-PMKSY 2.0 focuses on the adaptation and mitigation of the adverse impacts of climate variability and change to shift the approach to watershed development. Among the six SDGs, 2.4 and 15.1 have the highest and second-highest association with the policies, respectively. These include sustainable food production systems and resilient agricultural practices. In this way, the adaptation to climate change is strengthened, and soil and land health is ensured. Further, there is an emphasis on ensuring the conservation, restoration, and sustainable use of freshwater ecosystems and their services.

Figure A5: High and medium positive impacts and neutral impact of the schemes on the SDGs related to climate change adaptation and mitigation



Source: Authors' analysis



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