

## POTENTIAL OF INTEGRATED WATERSHED MANAGEMENT PROGRAMME IN FURTHERING THE SUSTAINABLE DEVELOPMENT GOALS: AN ASSESSMENT THROUGH LOCALISATION PERSPECTIVE

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### How to cite this paper:

Mathur Twinkle and Jalan Seema (2025) Potential of Integrated Watershed Management Programme in Furthering the Sustainable Development Goals: An Assessment Through Localisation Perspective, Journal of Global Resources, Vol. 11 (01)

### DOI:

10.46587/JGR.2025.v11i01.005

**Received:** 05 November 2024

**Reviewed:** 18 November 2024

**Final Accepted:** 15 Dec. 2024

  
**Freely available Online**  
[www.isdesr.org](http://www.isdesr.org)

**Abstract:** *The 17 goals and 169 targets defined as the Sustainable Development Goals (SDGs) by the United Nations (UN), spread their network over each and every aspect of the world community as a whole. Localisation of the SDGs is the most important task as the goals are in general and abstract form which should get tailored according to the needs of local communities. Thus, to make them a reality, they should get adopted at the grassroot level and implemented with the participation of people living there-in. This can be achieved through the schemes and programmes being implemented by the government with a tiered administration channel involving national, subnational and regional authorities for execution. For timely and effective realisation of the goals, it is essential that the programmes are evaluated in terms of their capacity in targeting SDGs. The Integrated Watershed Management Programme (IWMP) is one such scheme which focuses on efficient utilisation and sustainable management of natural resources, as well as improving the socio-economic status of the local communities. The study analyses the potential of IWMP in furthering and achieving the SDGs. The SDGs, corresponding targets and indicators have been cross-mapped with the activities undertaken towards implementation of the scheme. The analysis indicates a positive role of the programme in localising the SDGs.*

**Key words:** Localisation, Land Degradation, Rural Development, Watershed Management

## **Introduction: Sustainable Development Goals (SDGs)**

The SDGs are a set of 17 goals and 169 targets, adopted by the United Nations (UN) General Assembly in September 2015. They are a global agenda and the world has pledged to achieve them till 2030 (Faridi, 2021). They address the most critical challenges like poverty, health, inequality, climate change, peace and justice etc. (Tsani, 2020). According to UN Department of Economic and Social Affairs (DESA) (2023), all 193 UN member states have vowed to put their efforts towards the achievement of SDGs. They work as a binding agent for the communities across the nations. The clearly defined targets provide a roadmap for promising attainment of the goals. SDGs are comprehensive, universally applicable and promise a sustainable future for all leaving no one behind (Osborn, 2015). Their objectives resonate with the challenges faced by the developing countries, making them extremely relevant for countries like India. As has been stated by the National Institute for Transforming India (NITI) Aayog (2019), "India will play a leading role in determining the success or failure of the SDGs, given its disproportionate share in the global development burden". To make SDGs a reality, they should reach the most basic level of planning and implementation, i.e., the local level. According to the UN Habitat Report, "Localisation relates both to how local and sub-national governments can support the achievement of the SDGs through bottom-up action as well as how the SDGs can provide a framework for local development policy" (UN Habitat, 2016). The concept of localisation can be achieved by aligning the schemes and programmes implemented by the governments with the objectives of SDGs.

The Government of India is fully committed to achieve the global goals by 2030. There is a convergence of India's national development goals and agenda of, 'Sabka Saath, Sabka Vikas' or 'Collective Efforts, Inclusive Growth,' with the SDGs (NITI Aayog, 2019). The various developmental schemes of India are executed through a tiered administrative channel involving national, subnational and regional level authorities. The alignment of schemes with the SDGs is thus an effective strategy for their localisation. Various studies have analysed the alignment of Government schemes with the SDGs in context of India. Gupta et. al. (2021) has assessed the spatio-temporal progress towards achieving the SDGs under the Mahatama Gandhi National Rural Employment Guarantee (MGNREGA) Programme. Giribabu et. al. (2019) has correlated the social safety net programme with the SDGs and has found that the programmes generated numerous benefits for the community in a sustainable way and has helped to achieve all the 17 SDGs in India. IWMP is another such programme, with a mandate aligning with the SDGs.

## **IWMP: An Overview**

The Government of India introduced watershed development initiatives in the early 1970s. Their primary scope was limited to soil conservation and rainwater harvesting (Wani, 2009). IWMP, implemented in 2008, is a Centrally Sponsored Scheme (CSS) formed by merging three former programmes namely Desert Development Programme (DDP), Drought Prone Area Programme (DPAP), and Integrated Wastelands Development Programme (IWDP). It is being implemented under the name Watershed Development Component of Pradhan Mantri Krishi Sinchayee Yojana (WDC-PMKSY) since 2015-16 (MoRD, 2021-22). WDC-PMKSY 2.0 targets 4.95 million hectares of rainfed/degraded land with a total budget allocation of 8,134 crores (DoLR, 2023). The use of GIS and remote sensing techniques is to be extensively implied for efficient planning of the projects. Participatory Rural Appraisal (PRA) approach forms the basis of the scheme to utilise the knowledge and opinions of the rural people in management and planning (Nongpoh, 2009-10). It is being implemented through dedicated administrative units on national, subnational and regional level as under (Reddy, 2015).

- National Level: National Rainfed Area Authority (NRAA)
- State Level: State Level Nodal Agency (SLNA)
- District Level: Watershed Cell cum Data Centre (WCDC) (MoRD, 2021-22).
- Project Level: Government, non-government agencies and Panchayats selected as Project Implementing Agency (PIA). A Watershed Development Team (WDT) works under each PIA (NRAA, 2011).
- Village Level: At field level, a Watershed Committee (WC) is formed by Gram Sabha for project execution. The committee members consist of Self-Help Groups (SHGs) and User Groups (UGs), SC/STs, women and landless (MoRD, 2021-22).

IWMP is the second largest watershed programme in the world after China's (World Bank 2014). It is one of the most important schemes aiming at holistic rural development. Various studies have been conducted to evaluate the impact of watershed management on rural development. Pathak et. al (2013) analysed the growth in ground water availability and changes in cropping patterns with high value crops in Gokulpura-Govardhanpura Watershed in Bundi district of Rajasthan. The analysis shows a positive role of the interventions carried out during watershed management programmes. Johnson et. al. (2013) in micro-watershed K. Puthukottai located in Dindigul District, Tamil Nadu and Ronge (2017) in Aapsinga village, Maharashtra, have assessed natural resource conservation and livelihood generation through implementation of watershed management programmes and concluded increase in irrigation potential and crop diversification. The impact of watershed management on socio-economic development of the rural community has also been studied by Gojiya (2018) in hilly tribal areas of Madhya Pradesh, Chishi (2018) in Nagaland, and Manu (2020) in Kerala. Wani (2009) adopted a consortium approach in the research on Adarsha Watershed, Kothapally, Andhra Pradesh, India. The studies underline the positive role of the scheme in holistic development of the watershed region. However, studies evaluating the correspondence between IWMP initiatives and SDGs have not been widely undertaken.

### **Objectives of the Study**

This study aims to assess the potential of IWMP in furthering progress towards achievement of the SDGs in context of India. Specific objectives have been outlined below.

1. To examine the linkages between the IWMP initiatives and the SDGs.
2. To map the specific scheme initiatives with specific SDG targets and indicators which can potentially translate into localisation of SDGs.

### **Methodology**

The study has been conducted in two major steps.

1. All activities and initiatives under IWMP, aligning with the SDGs as a whole, have been identified. The analysis is based on Common Guidelines for the implementation of IWMP outlined by NRAA (2011) and WDC-PMKSY Reports (DoLR, 2023).
2. The direct and indirect link between specific SDGs targets and indicators and specific IWMP initiatives has been mapped in the form of a matrix. This analysis is based on the National Indicators Framework developed by the NITI Aayog (MoSPI, 2022). The data sources for related prospective studies and impact of the initiatives as a result of its successful implementation have also been identified.

### **Discussion: Scheme's Initiatives in Context of SDGs**

The objectives of the scheme are comprehensive, mutually integrated and closely relate to many SDGs. The initiatives and activities undertaken in the field, as part of the scheme, contribute significantly in furthering the SDGs. The objectives with their specific initiatives have been outlined below.

- **Watershed Development-** The task of watershed development is the widest as it includes management of natural resources. Land development by reducing degradation, soil and moisture conservation, construction of vegetative and engineering structures and rain water harvesting structures are the focused aspects.
  - **Socio-economic development-** The scheme focuses on providing better livelihood opportunities through skill development, capacity building and training programmes, promoting small scale enterprises and diversifying rural economy.
  - **Rural economic diversity-** The scheme supports adoption of Integrated Farming System (IFS) giving way to other economic activities like horticulture, sericulture, apiculture etc.
  - **Climatic adaptability-** The activities implemented indirectly helps in increasing adaptation towards floods, droughts, global warming and other meteorological hazards.
  - **Participatory Rural Appraisal (PRA) -** To decentralise the planning and implementation process by involving the local community in the decision-making process. Entry Point Activities (EPA) are undertaken to gain trust of the people.
- The sub-heads and initiatives of the scheme, undertaken towards the scheme objectives, have been summarised in Table 1.

**Table 01: List of IWMP objectives**

<b>Objective</b>	<b>Sub-Head</b>	<b>Initiatives</b>
Watershed Development	Land Development (Productive use)	Afforestation, Horticulture, Agriculture, Pasture land development
	Soil & Moisture Conservation	Staggered trenching, Contour bunding, Graded bunding, Bench terracing, Others
	Vegetative and Engineering Structure	Earthen checks, Brushwood checks, Gully plugs, Loose boulder, Gabion structure, Others
	Water Harvesting Structure (New created and renovated)	Farm ponds, Check dams, Nallah bunds, Percolation tanks, Ground water recharge structure, Others
Entry Point Activities (EPA)		Chabutra construction, Pyau construction, R.O Water plant, Pashupyau, Handpump construction, Panghat construction
Institution & Capacity Building		SHG Formation, UG Formation, Formation of Federation, Trainings & capacity building, Livelihood activities for the asset-less persons
Production system and Micro-enterprises		Sericulture, Beekeeping, Poultry, Fisheries, Bio-fuel Plantation etc.

Source: IWMP Management Information System (MIS), Dept. of Land Resources, MoRD, GOI (DWDS, 2011)

The SDGs related to water resource management, poverty reduction, environmental sustainability etc. particularly align with the scheme's initiatives. The deliverables of the scheme have increased by linking it with the SDGs. The following section maps the SDGs targets and indicators with the IWMP initiatives.

### **Linkages between Specific SDGs and Scheme's Initiatives**

The initiatives and activities undertaken as part of IWMP have direct and indirect links with the SDGs, targets and indicators. Goal-wise summary of directly and indirectly linked targets has been given in Table 2.

**Table 02: Mapped SDGs targets and indicators**

SDG	Directly Achievable Targets	Indirectly Achievable Targets
Goal 1	1.5 (1.5.4)	1.1 (1.1.1), 1.3 (1.3.4), 1.4 (1.4.1)
Goal 2	2.3 (2.3.2) and 2.4 (2.4.1)	
Goal 4	4.3 (4.3.1)	
Goal 6	6.4 (6.4.1, 6.4.2 and 6.4.3), 6.5 (6.5.1), 6.b (6.b.1)	
Goal 12	12.2 (12.2.1)	
Goal 15	15.1 (15.1.1 and 15.1.2), 15.2 (15.2.1), 15.3 (15.3.1)	

Source: Compiled by the authors

### **Goal 1: End poverty in all its forms everywhere**

IWMP indirectly contributes in reducing poverty by introducing skill development, capacity building and training programmes and small-scale enterprises for increasing livelihood opportunities, employment generation and boosting the socio-economic conditions of the rural community. Diversification of rural economy and agricultural system through non-farming economic initiatives like apiculture, sericulture, fisheries etc is achieved through the scheme. They aim for implementation of social protection systems specially aimed for vulnerable and poor sections, equal access to economic resources, land ownership and basic services and reducing exposure to extreme climatic variability. The specific targets and indicators have been mapped against the initiatives in Table 3. (See Annex)

### **Goal 2: End hunger, achieve food security and improved nutrition and promote sustainable agriculture**

The initiatives achieve better agricultural productivity through improving land efficiency, curbing land degradation, surface runoff and soil erosion. The net sown area is increased by improving upon the irrigation potential of the region. The outcome is improvement in the rural economic conditions. Other focused aspects are improving soil health, use of organic fertilisers and supporting adoption of climate-resilient farming practices. Table 4 (See Annex) maps the targets and indicators with IWMP initiatives.

### **Goal 4: Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all**

The scheme provides technical and vocational education through training programmes which include farmers' training on agriculture, skill development courses, specially aimed at women and young girls, livelihood activities for asset-less persons to improve the economic conditions of rural community. The targets and indicators along with the initiatives of the scheme have been summarised in Table 5.

### **Goal 6: Ensure availability and sustainable management of water and sanitation for all**

SDG 6 Clean water and sanitation is the main targeted goal through IWMP. Rain water is conserved with the help of Mini Percolation Tanks (MPT), rain water harvesting systems, gully plugs, check dams, etc to increase water use efficiency. Ground water level and per capita availability of water is enhanced. As mentioned in Table 6, (See Annex) target 6.5 aims for water resources management which is efficiently being achieved by the scheme through various measures. Participatory Rural Appraisal (PRA), Project Implementing Agencies (PIA), Self Help Groups (SHGs), User Groups (UG) and Gram Sabha support participation of local communities in improving water management. This gives a bottom-up approach in the implementation of the scheme. Overall, an integrated water resources management is achieved through successful execution of the scheme.

**Table 05: SDG 4 and IWMP Initiatives**

Targets	National Indicator	IWMP Initiatives	Initiative Purpose	Data Source	Impact
Target 4.3: By 2030, ensure equal access for all women and men to affordable and quality technical, vocational and tertiary education, including university	4.3.1: Participation rate of youth and adults in formal and nonformal education and training in the previous 12 months	<ul style="list-style-type: none"> <li>• Skill Development initiatives</li> <li>• Capacity building and training programmes</li> <li>• Livelihood activities for asset-less persons</li> <li>• Agriculture training programmes</li> </ul>	To improve upon the livelihood opportunities of the rural community specially aimed at women and young girls.	MoRD MIS	Better options for youths, women and all persons in general to earn a decent living. Improvement in social economic conditions of the people.

Source: Compiled by the authors

### **Goal 12: Ensure sustainable consumption and production patterns**

The scheme achieves the objective under Goal 12 through conservation of natural resources like land, water, soil and vegetation. Initiatives like afforestation, waste land development, pasture land development, contour trenches are implemented to attain the same. This reduces land degradation, soil erosion, surface runoff, loss of vegetation and rain water. Hence, this is one of the main targeted goals by the scheme.

**Table 7. SDG 12 and IWMP Initiatives**

Targets	National Indicator	IWMP Initiatives	Initiative Purpose	Data Source	Impact
12.2: By 2030, achieve the sustainable management and efficient use of natural resources	12.2.1: Percentage variation in per capita use of natural resources	<ul style="list-style-type: none"> <li>• Afforestation</li> <li>• Wasteland development</li> <li>• Pasture development</li> <li>• Contour trenches</li> </ul>	To protect and manage natural resources like land, water vegetation and soil	<ul style="list-style-type: none"> <li>• MoEFCC</li> <li>• Ministry of Jal Shakti</li> <li>• MoRD</li> </ul>	Restoration of degraded land, checking soil erosion, increase in vegetation cover and water conservation.

Source: Compiled by the authors

### **Goal 15: Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss**

Activities like afforestation, improvement in land degradation, conservation of rainwater, increase in ground water level, all work towards conservation of forest resources. This increases the area under forests as a percentage of total geographical area. Percentage of degraded land over total land area can also be maintained by the activities undertaken during scheme implementation. The overview of the Goal 15 and achievable targets along with the undertaken initiatives have been summarised in Table 8. (See Annex)

The SDGs cover a wide range of sustainable development issues, including poverty, hunger, health, education, gender equality, clean water and sanitation, renewable energy, economic growth, infrastructure, climate change, and biodiversity. IWMP promotes sustainable management of natural resources, improve the quality of life in rural and urban communities and promote a more sustainable future for all.

## Results

Different activities undertaken as part of the scheme implementation have specific objectives as per mandate of the scheme. However, the foregoing goal-wise analysis reveals a considerable overlap between the IWMP objectives and initiatives as they are furthering achievement of more than one SDGs. Specific SDG targets span across multiple objectives and specific objectives further a range of SDG targets. To simplify this complex inter-relationship, five major developmental approaches or broad themes have been identified, by combining the overlapping objectives, with a summary of all SDG targets achievable through the scheme's interventions under a particular theme.

1. **Sustainable Livelihood:** This objective fulfils targets 2.4 and 4.3 by adopting practices such as sustainable farming practices, skill development, capacity building and training programmes, supporting small-scale enterprises and diversifying rural economy through increasing other income generating measures like apiculture, sericulture, fisheries etc.
2. **Natural Resources Management:** Maximum number of targets i.e., 6.4, 6.5, 12.2, 15.1 and 15.2 are being achieved through management, conservation and sustainable utilisation of the natural resources like water, land, soil and vegetation through activities such as rain water harvesting, Mini Percolation Tanks (MPT), check dams, gully plugs, contour trenches, staggered trenches, wasteland development and pasture land development, graded bunding, bench terracing, earthen checks etc.
3. **Socio-Economic Development:** Targets 1.1, 1.4, 2.3 and 2.4 are achieved through the initiatives for social and economic development of the rural communities. They are diversifying agriculture and farming practices to make it more economically viable, skill development programmes, increasing agricultural productivity and other sources of income to end hunger, achieve food security and promote sustainable agriculture.
4. **Decentralisation/ Localisation:** This objective aims for targets 1.3 and 6.b. Participatory Rural Appraisal (PRA), Project Implementing Agencies (PIA), Self-Help Groups (SHG), User Group (UG) and Gram Sabha help in grassroot level execution in which the people are made the decision makers in planning and implementation process
5. **Equality:** This objective, aiming at targets 2.3 and 4.3, focuses on gender and social equality. Women and young girls are supported through skill development and capacity building programmes to enhance their income, social security and empowering them to lead a decent life. The enhanced agricultural productivity and diversified Integrated Farming System (IFS) are aimed specifically at small and marginal farmers, pastoralists, indigenous people, fishermen, etc. to increase social equality.
6. **Climatic Adaptability:** Various initiatives link the targets 1.5 and 15.3 with climatic adaptability. Water conservation measures, sufficient agricultural production to maintain the rural economy, afforestation, reducing land degradation all aim at reducing risk towards climatic variability and hazards like floods, droughts, famine, desertification, global warming etc.

Thus, the broad generalised themes provide a more comprehensive understanding of the initiatives undertaken during the implementation of the scheme and specific aspects of SDGs they are potentially achieving.

## Conclusion

The study maps the IWMP activities and Initiatives with the SDG targets and Indicators. SDG 1 (targets 1.1, 1.3, 1.4 and 1.5), 2 (targets 2.3 and 2.4), 4 (target 4.3), 6 (targets 6.4, 6.5 and 6.b), 12 (target 12.2) and 15 (targets 15.1, 15.2 and 15.3) are being fulfilled by the scheme's initiatives. It serves to achieve SDGs on specific themes like poverty reduction, sustainable food production, natural resources management and climate adaptation, as has been identified in the study. The scheme is relevant in all aspects as it focuses on integrated development and establishes direct linkages with the SDGs, thus furthering the localisation of aforesaid SDG at micro level. Localisation aspects of the scheme helps in connecting well with the local community. These linkages and their role in localisation of SDGs across space, social strata and time present a plethora of research avenues for geographers.

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**Table 03: SDG 1 and IWMP Initiatives**

Targets	National Indicator	IWMP Initiatives	Initiative Purpose	Data Source	Impact
1.1: By 2030, eradicate extreme poverty for all people everywhere, currently measured as people living on less than USD 1.25 a day	1.1.1: Poverty gap ratio	<ul style="list-style-type: none"> <li>• Integrated Farming System (IFS)</li> <li>• Skill development programmes</li> <li>• Capacity building and training programmes</li> </ul>	Activities are undertaken to diversify the rural economy, increase better livelihood opportunities and decrease poverty issues.	Ministry of Rural Development (MoRD)	Improvement in social and economic conditions of the rural community.
1.3: Implement nationally appropriate social protection systems and measures for all, including floors, and by 2030 achieve substantial coverage of the poor and the vulnerable	1.3.4: Number of Self-Help Groups (SHGs) provided bank credit linkage	<ul style="list-style-type: none"> <li>• Formation of Self-Help Groups</li> <li>• SHGs are provided with a revolving fund</li> </ul>	To decentralise implementation mechanism and strengthen ground level planning committees	<ul style="list-style-type: none"> <li>• NABARD</li> <li>• MoRD</li> </ul>	Swift implementation on grassroot level and financial inclusiveness
1.4: By 2030, ensure that all men and women, in particular the poor and the vulnerable, have equal rights to economic resources, access to basic services, ownership and control over land and other forms of property, inheritance, natural resources, appropriate new technology and financial services, including microfinance	1.4.1: Proportion of population living in households with access to basic services	<ul style="list-style-type: none"> <li>• Water Harvesting Structures</li> <li>• Mini Percolation Tanks</li> <li>• Contour bunds</li> <li>• Staggered trenches</li> <li>• Vegetative and Engineered Structures</li> </ul>	To improve access to water resources, curbing land degradation, increasing irrigation potential, Reducing soil erosion and surface runoff	<ul style="list-style-type: none"> <li>• MoRD</li> <li>• Ministry of Jal Shakti</li> <li>• Department of Land Resources</li> </ul>	Construction of water reservoir, improvement in land resources, and increase in living standards
1.5: By 2030, 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	1.5.4: Proportion of local governments adopt and implement local disaster risk reduction strategies in line with national disaster risk reduction strategies	<ul style="list-style-type: none"> <li>• Check dams</li> <li>• Water reservoirs</li> <li>• Gully plugs</li> <li>• Earthen Checks</li> <li>• Afforestation</li> </ul>	To reduce the risk of climate variability and increase adaptation towards floods, droughts, global warming and other meteorological hazards.	<ul style="list-style-type: none"> <li>• Disaster Management Division, Ministry of Home Affairs</li> </ul>	Reduction in exposure to climatic variability

Source: Compiled by the authors

**Table 04: SDG 2 and IWMP Initiatives**

Targets	National Indicator	IWMP Initiatives	Initiative Purpose	Data Source	Impact
2.3: By 2030, double the agricultural productivity and incomes of small-scale food producers, in particular women, indigenous peoples, family farmers, pastoralists and fishers, including through secure and equal access to land, other productive resources and inputs, knowledge, financial services, markets and opportunities for value addition and non-farm income.	2.3.2: Gross value added in agriculture per worker (in Rs.)	<ul style="list-style-type: none"> <li>• Integrated Farming System</li> <li>• Development of Pasture land</li> <li>• Small- Scale Enterprises</li> <li>• Apiculture</li> <li>• Sericulture</li> <li>• Beekeeping</li> <li>• Fisheries</li> </ul>	To increase the agricultural productivity and other sources of income for small and marginal farmers, women indigenous people and fishermen.	<ul style="list-style-type: none"> <li>• Department of Land Resources,</li> <li>• MoRD</li> <li>• Ministry of Statistics and Program Implementation</li> </ul>	Diversifying rural economy through small scale enterprises and increase in agricultural productivity
2.4: By 2030, ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters and improve land and soil quality	2.4.1: Proportion of net sown area to cultivable land	<ul style="list-style-type: none"> <li>• Agriculture on Wasteland</li> <li>• Horticulture on wasteland</li> <li>• Pasture development</li> <li>• Water reservoir</li> </ul>	To make efficient use of land resources and bring it under cultivation.	<ul style="list-style-type: none"> <li>• Ministry of Agriculture and Farmers' Welfare</li> <li>• MoRD</li> <li>• Min of Environment Forest and Climate Change (MoEFCC)</li> </ul>	Reduction in wasteland and increase in land under cultivation

Source: Compiled by the authors

**Table 6. SDG 6 and IWMP Initiatives**

Targets	National Indicator	IWMP Initiatives	Initiative Purpose	Data Source	Impact
6.4: By 2030, substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity	6.4.1: Per capita storage of water, 6.4.2: Percentage ground water withdrawal against availability 6.4.3: Per capita availability of water	<ul style="list-style-type: none"> <li>• Mini Percolation Tanks</li> <li>• Anicuts</li> <li>• Rain Water Harvesting Systems</li> <li>• Staggered Trenches</li> <li>• Nallah Bunds</li> <li>• Gully Plugs</li> </ul>	To make efficient use of rain water by constructing water conservation structures, increasing water infiltration and more per capita availability of ground water.	<ul style="list-style-type: none"> <li>• Bhuvan Portal</li> <li>• MoRD</li> <li>• CGWB, Ministry of Jal Shakti</li> </ul>	Growth in ground water level, per capita storage capacity, and decrease in net ground water withdrawal
6.5: By 2030, implement integrated water resources management at all levels, including through transboundary cooperation as appropriate	6.5.1: Degree of integrated water resources management	<ul style="list-style-type: none"> <li>• Check dams</li> <li>• Rain water harvesting</li> <li>• Gully plugs</li> <li>• Nallah bunds</li> <li>• Mini percolation tanks</li> <li>• Farm ponds</li> </ul>	All the efficient engineered structures are amalgamated and integrated to enhance the effect on water resource management	<ul style="list-style-type: none"> <li>• Ministry of Jal Shakti</li> <li>• MoRD</li> </ul>	The integrated structures yield better results in terms of water resources management
6.b: Support and strengthen the participation of local communities in improving water and sanitation management	6.b.1: Proportion of villages with Village Water & Sanitation Committee [VWSC]	<ul style="list-style-type: none"> <li>• Participatory Rural Appraisal</li> <li>• Project Implementing Agencies</li> <li>• Self-Help Groups</li> <li>• User Groups</li> <li>• Gram Sabha</li> </ul>	Purpose of formation is to have bottoms-up approach, including people in implementation process by forming various committees	<ul style="list-style-type: none"> <li>• MoRD</li> </ul>	Gaining the trust of local community, grassroot level approach helps in more efficient implementation of the procedure.

Source- Compiled by the author

**Table 8. SDG 15 and IWMP Initiatives**

Targets	National Indicator	IWMP Initiatives	Initiative Purpose	Data Source	Impact
15.1: By 2020, ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains and dry lands, in line with obligations under international agreement	15.1.1: Forest cover as a percentage of total geographical area 15.1.2: Protected area as percentage of total geographical area	<ul style="list-style-type: none"> <li>• Afforestation</li> <li>• Mini Percolation Tanks</li> <li>• Graded bunding</li> <li>• Bench terracing</li> <li>• Earthen checks</li> </ul>	To increase vegetation cover, maintain soil moisture and underground water percolation	<ul style="list-style-type: none"> <li>• MoEFCC</li> <li>• MoRD</li> </ul>	Growth in vegetation cover through afforestation, conserving soil moisture and reducing land degradation
15.2: By 2020, promote the implementation of sustainable management of all types of forests, halt deforestation, restore degraded forests and substantially increase afforestation and reforestation globally	15.2.1: Progress towards sustainable forest management	<ul style="list-style-type: none"> <li>• Afforestation</li> <li>• Pasture development</li> <li>• Horticulture</li> </ul>	To increase forest cover and reduction in wasteland to cover it with vegetation	<ul style="list-style-type: none"> <li>• MoEFCC</li> <li>• Ministry of Jal Shakti</li> <li>• MoRD</li> </ul>	Wasteland gets converted into fertile land covered with vegetation.
15.3: By 2030, combat desertification, restore degraded land and soil, including land affected by desertification, drought and floods, and strive to achieve a land degradation-neutral world	15.3.1: Proportion of land that is degraded over total land area	<ul style="list-style-type: none"> <li>• Wasteland development</li> <li>• Contour trenches</li> <li>• Staggered trenches</li> <li>• Adaptation to climatic variability</li> </ul>	To conserve the degraded land and soil, improve risk towards meteorological hazards like droughts, floods, etc	<ul style="list-style-type: none"> <li>• MoEFCC</li> <li>• Ministry of Jal Shakti</li> <li>• MoRD</li> </ul>	Reduction in risk towards climatic variability, improvement of land resources and soil conservation.

Source: Compiled by author