



WRI INDIA

PRACTICE NOTE

From pilot to scale: Lessons in community- led landscape restoration in Sidhi, Madhya Pradesh

Insights from participatory approach to
landscape restoration

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HIGHLIGHTS

- Healthy landscapes are the foundation of resilient communities, productive agriculture, and sustainable rural economies.
- India's commitment to restoring landscapes is demonstrated by its international pledges and national priorities. Achieving these goals requires identifying restoration potential and assessing the related environmental and socioeconomic benefits.
- WRI India adapted the Restoration Opportunities Assessment Methodology (ROAM) to the Indian context to map the restoration potential in Sidhi district, Madhya Pradesh. Next, it designed and implemented a pilot landscape restoration initiative in a 9,000-hectare cluster of 13 villages in Sidhi.
- WRI India collaborated with the Panchayat and Rural Development Department, Government of Madhya Pradesh; the implementation partner, Action for Social Advancement (ASA); and the district administration of Sidhi to implement restoration interventions using an integrated landscape approach.
- The pilot initiative brought land under restoration across the villages in Sidhi district. By aligning existing public schemes with corporate social responsibility (CSR) support and participatory governance, the project facilitated effective planning and community-prioritized execution of restoration interventions..
- The initiative demonstrates how a landscape restoration initiative can simultaneously advance climate mitigation and adaptation by integrating ecological restoration with the priorities of the local community. The learnings from the pilot are now being scaled to additional blocks within Sidhi district and similar geographies.

Executive Summary

Context

Restoring land has become increasingly urgent as climate impacts from hazards such as wildfires, droughts, floods, and erratic rainfall intensify. Degraded landscapes are less able to absorb shocks, making communities and economies more vulnerable. Climate-induced risks will exacerbate vulnerability, change weather patterns, and impact agricultural production and food security in South Asia and India (IFPRI 2022; IPCC 2022). Current adaptation measures remain insufficient, with vulnerable communities and ecosystems facing the impacts of climate risks such as declining soil health, biodiversity loss, and increased pressure from pests and diseases. It is critical to protect and restore these landscapes (forests, commons, and agricultural lands), which are at risk from rising temperatures, unsustainable farming practices, increased fragmentation, and degradation of forests.

To mitigate climate risks, build resilience, and improve the climate adaptation capacity of communities, the focus must be on restoring landscapes where the competing and complementary priorities of conservation, production, and economic development interact. Restoring a landscape through locally led strategies can offer tangible benefits for people, nature, and climate. These benefits include livelihood improvements, food and nutrition security, flow of ecosystem services, mitigation of climate risks, and enhanced resilience.

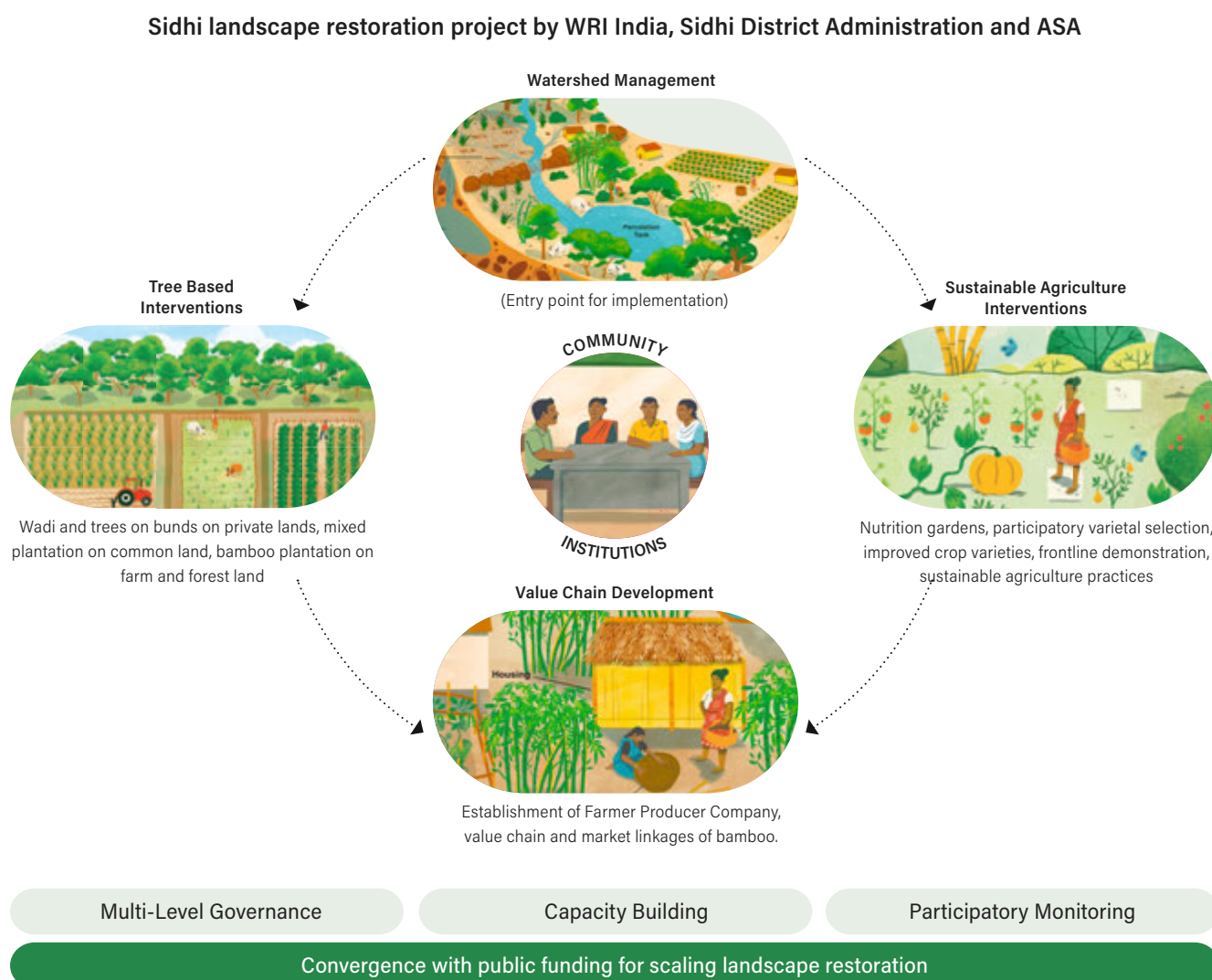
Despite the growing recognition of landscape restoration as a nature-based solution (NbS) for climate adaptation, rural development, and biodiversity conservation, the implementation of restoration interventions in India remains limited in scale and effectiveness. India has robust policies, including schemes such as the Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS), that can support restoration planning and implementation. Throughout this practice note, references to MGNREGS/MGNREGA pertain to the scheme as it operated during the implementation period of the Sidhi pilot for the duration March 2021– March 2025. Subsequently, MGNREGS was replaced by the Viksit Bharat–Guarantee for Rozgar and Ajeevika Mission (Gramin) (VB-G RAM G) Act in December 2025 (Government of India 2025). Additional schemes that can support restoration are Compensatory Afforestation Fund Management and Planning Authority (CAMPA), Rashtriya Krishi Vikas Yojana (RKVY), Ek Ped Ma

ke Naam, and other state-led initiatives. However, the translation of policy objectives into integrated, impactful action on the ground has been suboptimal (Duraismi et al. 2022). This is largely due to persistent implementation challenges such as the absence of viable business models and value chains for restoration-linked livelihoods; limited access to quality planting material and technical know-how; and policy or regulatory misalignments that disincentivize convergence across sectors. The institutional ecosystem for restoration is highly fragmented, with responsibilities spread across multiple departments. This often hinders non-governmental actors and small and medium enterprises (SMEs) from realizing their full potential, which often lack the capacity, technical support, and policy access to scale restoration initiatives, despite being well positioned as local champions (WRI India n.d.).

WRI India's Restoration Opportunities Atlas (Chaturvedi et al. 2018)—developed with data support from the International Union for Conservation of Nature (IUCN), Bharti Institute of Public Policy–Indian School of Business, Land Conflict Watch, and the University of Hyderabad—identifies a potential of over 100 million hectares (Mha) for wide-scale and mosaic restoration that can sequester 3–4.5 billion tonnes of above-ground carbon by 2040 (Chaturvedi et al. 2018). Translating this restoration potential into tangible impact would require designing interventions for landscape restoration in high-priority geographies. Restoration needs to be planned and localized in context-specific settings at the grassroots level to demonstrate scalable on-the-ground restoration actions through proofs of concept.

The restoration initiative undertaken in March 2021 in Sidhi district was designed in response to the restoration potential identified in Madhya Pradesh. The state of Madhya Pradesh has potential for forest protection and landscape restoration across more than 20 million hectares, specifically for mosaic restoration (in a patchwork of land uses) in 13 million hectares (Chaturvedi et al. 2018). By experimenting with a multi-stakeholder participatory planning approach to restoration, the initiative sought to demonstrate how restoration can move from policy and research intent to on-the-ground action while also offering insights into the institutional mechanisms needed for scaling such efforts. It illustrates how a landscape restoration implementation

FIGURE ES-1 | Project initiated by WRI India in collaboration with the Sidhi District Administration, Government of Madhya Pradesh, and Action for Social Advancement (ASA) in 2021



Source: WRI India authors.

model can enable both climate mitigation and adaptation by integrating ecological restoration with community priorities. Through decentralized leadership, local capacity-building, and community-led implementation, the initiative shows a proof of concept to restore degraded landscapes, strengthen climate resilience, and deliver long-term social and ecological impact (Figure ES-1).

The initiative was designed based on the findings of Sidhi's restoration opportunity assessment (Singh et al. 2020). The findings highlighted that the district has the potential to restore more than 300,000 ha, primarily outside forest areas, unlock jobs for local communities in Sidhi district, generate INR 710 million (USD 7.76 million¹) in wage income, and develop value chains around six key tree species (Singh et al. 2020). To translate these findings on ground, WRI India collaborated with

the Panchayat and Rural Development Department (P&RD), Government of Madhya Pradesh (GoMP); the implementation partner, Action for Social Advancement (ASA); and the district administration of Sidhi to implement restoration interventions in pilot cluster in Sidhi block using an integrated landscape approach.

The key fulcrum of this initiative was to maximize convergence with public funding for implementation of pilot restoration interventions. To mainstream an integrated landscape approach, the focus has been on implementing restoration interventions such as water resource management, soil and moisture conservation, tree-based restoration interventions, and enhancing livelihoods by promoting a value chain for bamboo and

other agriculture products through a farmer producer company (FPC) established under the project.

To maximize the impact on the ground, capacity-building was prioritized for the stakeholders involved in project planning and execution, with diverse stakeholders trained in various aspects of landscape restoration. To determine the efficacy of these interventions, the project designed participatory monitoring of landscape restoration interventions by local community members through a citizen science application developed by WRI India. This app was used to collect data through customizable survey forms tailored to specific restoration interventions and by gathering geotagged photographs. The implementation in the cluster was supported by a multi-scalar governance modality to effectively combine top-down and bottom-up approaches to create strong feedback loops and adaptive learning. Led by the district administration at the district level under the overarching policy-level guidance of a state-level Steering Committee, the project has maintained its momentum despite personnel changes at the local and apex levels. Periodic reviews by senior state government personnel effectively bolstered by professionals at WRI India and ASA has helped position the Sidhi initiative as a “proof of concept” for implementing nature-based solutions (NbS.). Encouraged by its success, efforts are now underway to replicate the Sidhi model across other districts in Madhya Pradesh.

About this practice note

This practice note documents the experience of implementing the Sidhi Landscape Restoration Initiative as a proof of concept that can enable both climate mitigation and adaptation by ensuring community-prioritized ecological restoration. It entails documenting and disseminating learnings from the Sidhi restoration initiative as a case study of an integrated approach to landscape restoration. It aims to serve as a reference for government functionaries and other relevant stakeholders in upscaling and expanding landscape restoration to other parts of the state of Madhya Pradesh.

The practice note provides a detailed description of the process adopted in planning, designing, and implementing landscape restoration. Specifically, it describes the integrated landscape approach to restoration and the process adopted in orchestrating different institutions such as government departments, community, civil society organizations (CSOs), and corporates that can support in executing the integrated landscape approach to restoration.

A mixed-methods approach is adopted combining a literature review, project documentation, and field-based insights to illustrate the project learnings from the Sidhi pilot (March 2021–March 2025), which was undertaken with ASA. The methodology addressed four core questions:

- What were the key steps and processes in planning and implementation?
- What enabling factors supported the outcomes?
- What challenges and learnings emerged?
- How can these insights inform scaling in similar geographies?

Steps followed for documenting project process planning and execution

WRI India's report, *Restoring Landscapes in India for Climate and Communities* (Singh et al. 2020), and the project's collaborative implementation plan were referred to trace the conceptualization and evolution of the restoration initiative. While WRI India's report (Singh et al. 2020) identified Sidhi's restoration potential, the collaborative implementation plan designed by WRI India and ASA translated the report findings into a practical road map. The review is further supported by an analysis of project reports (March 2021– March 2025) capturing field insights, outcomes, and case studies.

Analysis of project-specific field and policy insights drawn from ASA's and WRI India's quarterly and annual reports highlighted the following:

- The flow of ecosystem services generated from the implementation of various restoration interventions, such as availability of water for irrigation and domestic purposes, erosion control, fodder, and food security.
- The key enablers that supported project execution, such as the use of landscape principles for planning and implementing an integrated landscape approach, convergence with government schemes and programs, capacity-building, and monitoring.

This methodology captures both the institutional and social dimensions; and it shows not only what was done, but also how and why the approaches used were effective, and the enabling conditions for scaling landscape restoration.

Findings

The Sidhi pilot effectively operationalized the recommendations of the restoration opportunity assessment by integrating a set of “accelerators” that catalyzed the implementation on the ground.

. An accelerator is a structured, time-bound program that builds the capacity of specific stakeholders who can support and enable implementation of landscape restoration interventions. The local implementation partner in Sidhi supported the capacity-building of elected Panchayat members, small and marginal farmers, self-help groups (SHGs), water user groups, and government functionaries of various departments at the district and sub-district levels.

The policy accelerator facilitated interdepartmental coordination and resolved policy barriers through multistakeholder policy dialogues to align institutional priorities. The knowledge and technology accelerator focused on building awareness of restoration-related policies and processes while strengthening the technical capacities of men and women farmers, user groups, and communities. The market and business accelerators supported the creation of value chains for local produce, enhancing livelihood security and economic resilience. Together, these accelerators enabled the transition from assessment to implementation, demonstrating a scalable model of integrated landscape restoration (Figure ES-2).

FIGURE ES-2 | **Key accelerators that catalyzed restoration efforts in Sidhi**

ACCELERATOR	CHALLENGES IN SIDHI PILOT CLUSTER	DESIRED RESULTS POST PILOT INTERVENTION
 Policy Accelerator	- Inadequate access to public finance for implementing & scaling landscape restoration - Policy barriers	- Interdepartment coordination - Restoration policy dialogues - Farmers, gram panchayats and other key persons connected to public finance through government schemes
	Stakeholders:  Farmers, community members	 District Administration
 Knowledge Accelerator	- Poor awareness about policies, resources & rights - Absence of network/platforms for peer learning	- Communities awareness of laws, rights under MGNREGS and other schemes - Documentation of land records - ROAM trainings for NGOs for scaling restoration
	Stakeholders:  Community members, farmers, SHGs	 Non-government organizations  Krishi Vigyan Kendra
 Technology Accelerator	- Inadequate capacities to monitor landscape restoration - Lack of technical knowledge on landscape restoration	- Participatory monitoring for adaptive learning – citizen science application - Built technical capacity of farmers, other implementors
	Stakeholders:  Farmers, SHGs	 Implementation agencies
 Market & Business Accelerator	- Absence of tree based value chain - Absence of FPC in pilot cluster to build restoration business	- FPC established in pilot cluster for bamboo value chain - Market linkages with paper mill, Amlai, Madhya Pradesh - Livelihood enhancement
	Stakeholders:  Farmers	 Local traders, industries  Forest Department

Source: WRI India authors.

The Sidhi pilot demonstrated that landscape restoration can significantly enhance ecosystem services. A total of 1,041 ha was brought under restoration through construction of 523 soil and water conservation structures, tree-based interventions carried out in 454

ha, and sustainable agriculture in 676 ha have resulted in direct benefits for communities in the pilot area by enhancing the flow of ecosystem services, such as provision of food, fodder, water recharge, and supporting biodiversity (Figure ES-3).

FIGURE ES-3 | Land-use challenges, restoration interventions, and ecosystem services in the Sidhi pilot cluster



Policy Interventions

Source: WRI India authors.

Restoration efforts on landscapes enhanced rural livelihoods through employment generation, value chain creation, and local enterprise development.

By bringing the land under restoration and aligning interventions with local economic needs, the project facilitated wage employment to over 13,000 households through the erstwhile MGNREGS. It also incubated restoration-linked enterprise by promoting the Gopadbanas, an FPC with over 400 shareholder farmers. The FPC facilitated value chains for bamboo in partnership with Orient Paper Mills, Amlai, Madhya Pradesh, and promoted the distribution of high-yielding wheat and paddy seeds, improving seed replacement rates and crop productivity. With a turnover of INR 4.75 million (USD 51,978.14) during the project, the presence of the FPC in Sidhi project area has strengthened farmers' access to markets by enabling collective aggregation and reducing dependence on intermediaries. This has provided an additional and more stable income stream beyond traditional agriculture, enhancing overall livelihood security. The initiative illustrates how restoring ecosystems can drive long-term socioeconomic gains in rural landscapes.

Blending CSR and public funds enabled streamlined financing for landscape restoration in Sidhi. Through systematic planning and targeted investments, the pilot achieved public fund convergence, with 67.52 percent of funds sourced from public schemes—including MGNREGS (47.99 percent), Watershed Funds (18.55 percent), and National Bank of Agriculture and Rural Development (NABARD; 0.98 percent)—and 32.48 percent from private sources such as CSR. This strategic financing mix was instrumental in implementing large-scale restoration interventions effectively and offers a scalable model for other regions.

Targeted capacity-building enables an inclusive, technically sound, and community-led implementation. Institutional and community capacities of different stakeholders were strengthened, which are essential for successful restoration. Officials from the Rural Development Department were provided technical assistance in landscape planning, supporting them to scientifically design soil and water conservation structures under erstwhile MGNREGS. At the village and cluster level, SHGs, Panchayati Raj Institution (PRI) members, and village communities were oriented on natural resource management (NRM), and scheme access, resulting in improved ownership and participation. Training led by the implementation partner enhanced the understanding of entitlements, work code generation, and documentation processes under the MGNREGS and significantly improved the uptake of restoration works by community members. Civil society actors were also trained in landscape planning using ROAM, which enabled bridging

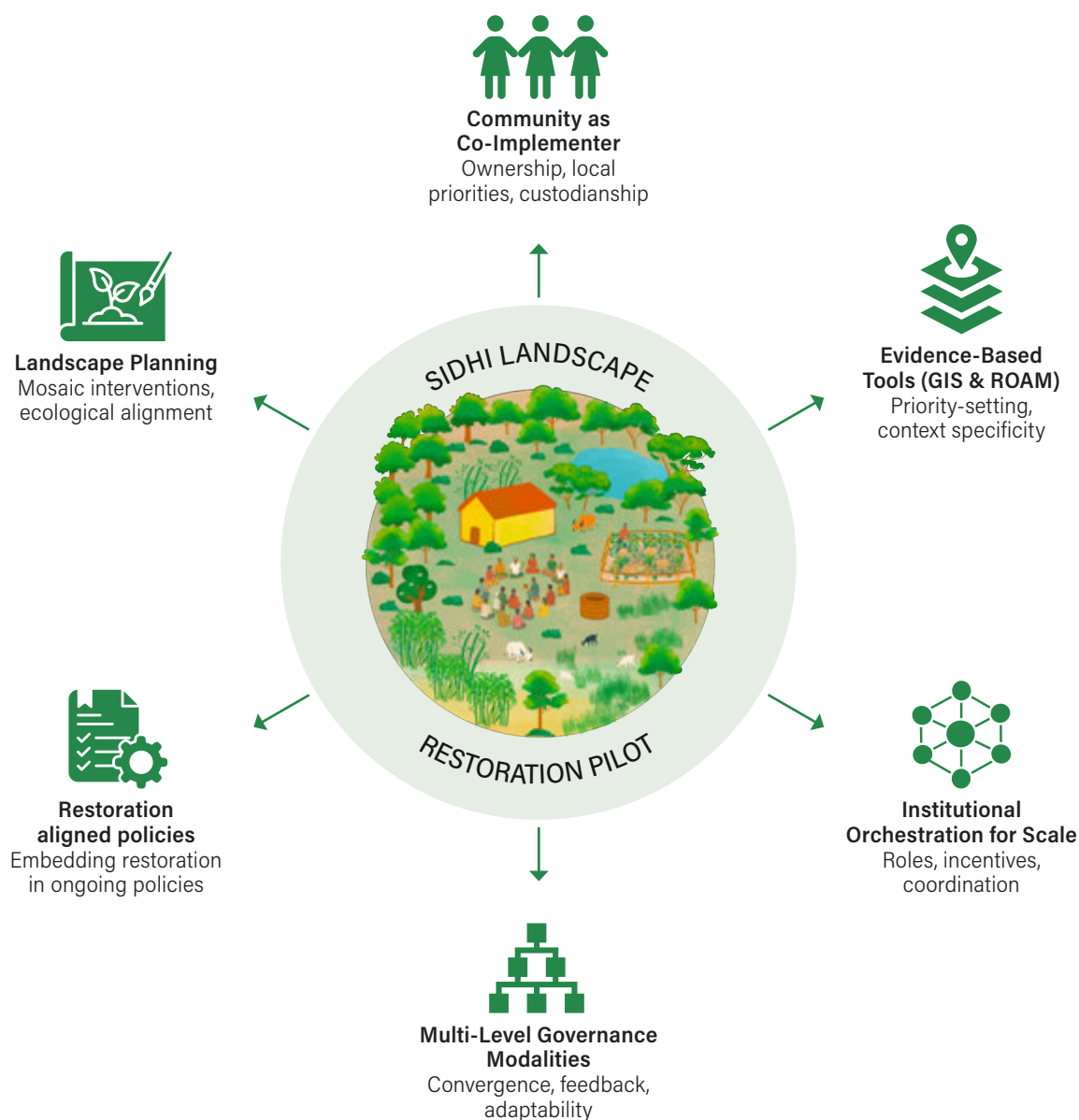
capacity gaps and laying out the groundwork for scalable, locally driven restoration.

The Sidhi initiative positioned restoration not just as a land management initiative but also as a structural redesign of how public systems, communities, and markets collaborate. The initiative marked a paradigm shift by reframing restoration from a project-based intervention to a governance and systems challenge. Instead of treating restoration as isolated plantation or infrastructure work, the initiative positioned it through the lens of how decisions, funds, and responsibilities flow across the public system. This meant aligning village-level planning with district- and state-level policy directives and considering Gram Panchayats not as beneficiaries but as planning units. It operationalized convergence not as mere co-funding but as co-ownership process, where administrative agencies, community institutions, and local civil society organizations (CSOs) jointly identified priorities, mobilized schemes, and co-created incentives. Most importantly, restoration evolved from being defined by what is implemented on land to being defined by who shapes, governs, and benefits from it, shifting the narrative from delivering ecological assets to building institutional and economic agency within rural landscapes.

Insights from the pilot implementation

The Sidhi restoration initiative served as an important piloting ground for understanding what it takes to operationalize landscape restoration. These learnings now offer a foundation for strengthening future restoration efforts toward scalability. The following insights have emerged from our experience with restoration implementation in Sidhi (Figure ES-4).

FIGURE ES-4 | Insights from the pilot implementation



Source: WRI India authors.

- **Sustained community mobilization is critical for long-term restoration success.** By working through existing grassroots institutions such as SHGs, FPC, and user groups, the project positioned communities as active co-implementers, allowing restoration efforts to reflect local priorities related to soil health, water access, fodder, and livelihoods. Continuous engagement enabled the integration of traditional knowledge with technical inputs and ensured that interventions were tailored to local contexts. This approach strengthened community ownership and

fostered long-term custodianship, improving the maintenance and sustainability of natural assets.

- **Restoration planning is most effective when approached at the landscape level and guided by robust spatial analysis.** Shifting the focus from isolated plots to the landscape enabled a better understanding of how land, water, and vegetation systems interact, particularly along ridge-to-valley and hydrological pathways. This was ensured through the landscape approach wherein interventions were

designed in response to specific land-use challenges across agriculture, commons, and forests rather than relying on uniform solutions. Adoption of restoration assessment methodology such as ROAM resulted in identifying priority areas for restoration in alignment with community priorities.

- **Well-defined governance modalities are critical for translating integrated landscape planning into effective action on the ground.** The establishment of structured coordination mechanisms at the district and block levels created formal spaces for convergence, review, and course correction that enabled alignment between administrative priorities and community-driven plans. This governance modality was particularly significant in Sidhi where restoration efforts required coordination across multiple departments, programs, and institutions operating at different scales. By combining top-down administrative oversight with bottom-up planning and feedback, the model allowed restoration interventions to remain adaptive to seasonal, ecological, and operational realities.
- **Momentum around landscape restoration is created when it is embedded within existing policy goals and policy goals and mainstreamed into country's development agenda.** When departments see restoration as a way to strengthen the delivery of ongoing schemes—such as improving water outcomes, livelihoods, or climate resilience—it becomes easier to integrate restoration into routine planning. This framing helps shift restoration from being viewed as an environmental add-on to a practical tool for better policy implementation. As a result, awareness and acceptance of climate-oriented actions increases, and convergence across departments emerges more organically, enabling restoration to be implemented more effectively and at scale.
- **Diversified financing is essential for sustained landscape restoration.** The restoration initiative demonstrated that landscape restoration cannot be sustained through a single funding source alone. Delays in public fund releases and scheme-specific financial constraints highlighted the need for a more flexible and coordinated financing approach. Future restoration efforts will need to combine multiple financing channels—such as government programs, private investment, and civil society support—to ensure continuity and scale.
- **Scaling restoration in India requires institutional coherence.** To upscale restoration, the process must be rooted in roles, incentives, and coordination mechanisms that can travel across districts irrespective of geography or sectoral focus. The core insight from Sidhi is that restoration does not need to be multiplied

program by program; it can be institutionalized when state systems recognize landscape planning as a process that is integral to holistic climate adaptation and mitigation rather than as a line item. This shifts the question from “How do we expand restoration?” to a far more durable pathway to scale: “How do we embed restoration into how development is designed and funded?”

The Sidhi pilot has demonstrated that landscape restoration is not merely an environmental intervention, but one that intersects with governance mechanisms.

By grounding action in local institutions, scientific assessments, and participatory planning, the initiative has shown a viable pathway for integrating NbS into mainstream rural development. Building on its learnings, restoration efforts are expanding to adjacent blocks in Sidhi, leveraging local CSOs, market linkages, and restoration-positive value chains to support livelihoods. The pilot provides a foundation for a scalable framework in Madhya Pradesh guiding state-level planning for restoring landscapes, climate mitigation, and inclusive development.

FIGURE ES-5 | **A farmer in his agricultural field in Sidhi, Madhya Pradesh**



Source: WRI India.

Introduction

Forests and agricultural landscapes continue to support the livelihoods, food security, and resilience of millions of rural households in India, particularly tribal communities, women, and smallholder farmers. The small and marginal holdings (below 2.00 ha.) constitute eighty-six percent of the total operational landholdings in India making it critical to protect and restore forests and farmlands (MoAFW 2020). However, unsustainable farming practices, shrinking landholdings, and increased forest fragmentation are putting nature, the climate, and livelihoods at risk. As soil becomes increasingly infertile from unsustainable farming and grazing pressure, small and marginal² farmers struggle to produce enough food. Meanwhile, biodiversity is lost at unprecedented rates due to several climatic and human-induced factors across the country. For instance, 90 percent of the area in biodiversity hotspots has been lost (CSE 2021). Climate change accelerates all these impacts, causing more severe floods and droughts. According to the Desertification and Land Degradation Atlas of India (SAC 2021), the current extent of land degradation in India is 97.85 million hectares, which represents approximately 29.77 percent of the country's total geographical area.

When the land is less productive and non-resilient to climate shocks, incomes shrink and hunger and malnutrition increase, especially in rural and forest-fringe communities dependent on agriculture for food and income. Child malnutrition remains high: 35.5 percent of children under five are stunted, 19.3 percent are wasted, and 32.1 percent are underweight (IIPS and ICF 2021). These indicators reflect how degraded landscapes affect water availability, soil fertility, crop yields, and forest-based services and undermine food security and livelihoods in vulnerable communities. Thus, landscape restoration is not only an ecological imperative but a social investment: by restoring ecosystem services, we strengthen livelihoods, enhance nutritional outcomes, and reduce poverty.

The significance of landscape restoration is evidenced by the multiple international commitments made by the Government of India (GoI) for restoration. These include India's Bonn Challenge and Land Degradation Neutrality (LDN) commitment to restore 26 million hectares of degraded and deforested land by 2030 and its updated Nationally Determined Contribution (NDC) target of creating an additional carbon sink of 3.5–4.0 billion tonnes of CO₂ equivalent through enhanced forest and tree cover by 2035 (Government of India 2026; MoEFCC 2026).

Between 2011 and 2016, the GOI allocated INR 102505 crores (16 billion USD) to protect and improve forests and extend tree cover through public financing.” (Chaturvedi et al 2018). The GoI also introduced other key types of budgetary support—a mix of compensatory mechanisms and incentives to support forest protection and restoration—and several state governments have implemented similar initiatives. However, despite the proven potential of restoration initiatives, government commitments, and enabling policies, the implementation of restoration interventions has been suboptimal (Duraismi et al. 2022).

To meet the goals of the GoI's pledges, more stakeholders will need to be supported in their restoration efforts by bridging capacity gaps and sharing knowledge, expertise, and resources to promote the most effective and inclusive ways of restoring land (Duraismi et al. 2022). Landscape restoration interventions can be varied and diverse depending on the type of ecosystem. Some of the restoration interventions include agroforestry, silvopasture, reforestation, mixed-species plantations, linear plantation, riparian restoration, mangrove restoration, assisted natural regeneration, and farmer-managed natural regeneration, among many others. Selection of an appropriate restoration intervention depends on multiple factors: such as land use, land ownership, biophysical characteristics (slope, elevation, and soil type), socioeconomic factors, and the goal or objective of the restoration (Kakani et al. 2024). The landscape approach to restoration, when conducted in the right way, is a transformational strategy that can combat land degradation, reduce fragmentation, and improve land productivity (see Box 1).

There is a need for landscape-level planning and synergistic convergence of public funds for streamlined execution of restoration efforts. WRI India research suggests developing restoration plans and strategies using a landscape approach at the state and district levels. This approach would consider multiple land uses, ecosystem service needs, and the priorities of local communities (Duraismi et al. 2022). To operationalize this landscape approach in Sidhi, a restoration opportunity assessment was carried out as a foundational step, which is explained in detail in the subsequent sections. The next section outlines the methodology adopted for writing this practice note, drawing from the literature, project data, and field insights gathered over the course of the pilot.

BOX 1 | The landscape approach to restoration

The landscape approach to restoration seeks to reestablish the ecological functionality of a landscape while engaging local stakeholders and adapting to local social, economic, and political conditions. It brings together actors who identify and implement practices to achieve an optimal balance of ecological, social, and economic benefits from forests and agricultural landscapes (GPFLR n.d.). This approach enables planning resource management while considering trade-offs such as the competition between productive land uses and environmental and biodiversity goals. It provides a framework for reconciling conservation and development objectives in a landscape-centered focus on people and bringing key stakeholders together to solve problems such as land degradation, conservation of natural resources, and augmentation of local incomes and livelihoods (Sayer et al. 2013).

FIGURE B1 | A landscape view of Sidhi highlighting the interconnected mosaic of farms, human settlements, and forests



Source: WRI India.

When undertaken systematically at the planning and implementation stages, a landscape approach to restoration, will consider fundamental principles, clarification of rights and responsibilities, and the multifunctionality of landscapes (Sayer et al. 2013). The approach uses tools such as participatory monitoring, building resilience into project planning, and stakeholder engagement to enable adaptive management with a dual focus on conservation and poverty alleviation.

Source: Kakani et al. (2024).

Methodology

For the purpose of writing this practice note, the terms “pilot,” “project,” “proof of concept,” “Sidhi restoration initiative,” and “pilot cluster” are used interchangeably to refer to the landscape restoration effort undertaken in Sidhi. This practice note aims to document the key processes involved in designing and executing the landscape restoration initiative in Sidhi. However, it does not necessarily focus on capturing the impact of project activities.

The practice note draws on a mixed-methods approach combining a literature review, project documentation, and field-based insights to comprehensively document the planning, implementation, and outcomes of the integrated landscape restoration pilot in Sidhi, Madhya Pradesh. The Sidhi pilot was executed between March 2021 and March 2025 in collaboration with our local implementation partner ASA. The methodology was designed to address the following research questions:

- What were the key steps and processes adopted in planning and implementing the integrated landscape restoration pilot in Sidhi, Madhya Pradesh?
- What are the enabling factors that supported the pilot implementation?
- What were the challenges and significant learnings that emerged during the pilot’s implementation?
- How can insights from the Sidhi pilot experience inform the design and scaling of similar integrated approaches in other parts of Madhya Pradesh and other similar geographies?

The following process was followed for the analysis:

- An existing WRI India publication—Restoring Landscapes in India for Climate and Communities (Singh et al. 2020)—and the collaborative implementation plan for the pilot³ were reviewed.
- Field-based insights, case studies, outcome data, and project challenges and learnings were qualitatively analyzed using the project progress reports created during the pilot.⁴

Project resources referred for writing the practice note

Our understanding of the WRI India publication by Singh et al. (2020) emerged as the starting point in documenting this practice note. We drew insights on the process of identifying the restoration potential of Sidhi

district and highlighting it as a priority geography for piloting integrated landscape restoration. The publication comprises of the ROAM assessment, as adapted by WRI India to the Indian context, underscored both the ecological opportunities and developmental priorities. In the case of Sidhi, it provided insights into the following:

- **Ecosystem services** that could be enhanced through targeted restoration interventions
- **Livelihood opportunities analysis** that identified restoration value chains which could benefit local communities
- **Institutional networks** and actors whose participation would be critical to implementation and scaling
- **Structural issues** around governance, policy incentives, equity, and inclusion that needed to be addressed

Through integrated spatial and socioeconomic analyses, ROAM helps determine which landscapes are most vulnerable to climate risks—such as soil degradation, water scarcity, and reduced agricultural productivity—and matches them with restoration interventions that also strengthen livelihoods. Its strong emphasis on community co-creation ensures that local priorities and traditional knowledge guide decision-making, and long-term sustainability.

Further, the ROAM assessment in Sidhi highlights institutional capacities and financing pathways that facilitate convergence with public schemes such as MGNREGS so that restoration investments are directed where they create maximum climate resilience and community benefit (Singh et al. 2020). By synthesizing these findings, our documentation in this practice note offers not only conceptual grounding but also provides an overview of the entry points for designing the Sidhi pilot. The WRI India report (Singh et al. 2020) provided insights into the restoration potential of the entire district and proposed enablers for tapping into that potential.

To translate the report’s findings into action and develop a proof of concept for the integrated landscape approach, a collaborative implementation plan was developed by ASA for the Sidhi restoration initiative (WRI India and ASA n.d). This was critical in documenting the process of pilot design, because the plan itself consolidated insights from stakeholder consultations, field assessments, and research conducted with the implementation partner, ASA. It laid out the sequence of steps and participatory processes that guided the transition from identifying restoration opportunities to shaping a concrete implementation roadmap.

Analysis of project data

Field-level insights were drawn from the documentation and reflections shared by the implementation partner, ASA, in the quarterly and annual project reports prepared during the pilot (March 2021– March 2025). The project reports comprised details on various community-led interventions implemented on the ground with the support of self-help groups (SHGs) and Gram Panchayats and anchored by the district administration along with narrative accounts of case studies from the field. The quarterly reports provided project outcomes across biophysical and socioeconomic indicators. The narratives were analyzed using the following lens:

- **Flow of ecosystem services and co-benefits:** Ecosystem services are the benefits humans derive from nature, such as provisioning, regulating, supporting, and cultural services. In Sidhi, these services provide vital resources such as fuel and fodder, ensure water availability, control soil erosion, and enhance food security—supporting both livelihoods and biodiversity conservation in the region.

- **Enabling factors for streamlined implementation:** This includes an analysis of enabling conditions and how these have served as key levers in streamlining pilot implementation. Some of these include the role played by different stakeholders in the planning and execution of the pilot, financing of the interventions, monitoring, governance modalities, policy incentives, interdepartmental convergence, and capacity-building.

Through this methodology, we have attempted to capture not only what was done but also how and why certain approaches were effective—especially the key enablers, highlighting how each enabler supported project execution and why. Further information is provided in the subsequent sections. The adopted methodology allowed for a detailed documentation of the implementation process, institutional and community-level dynamics at play, and the conditions under which integrated landscape restoration can be scaled effectively. The next section describes the approach and processes adopted in designing and implementing the Sidhi pilot. The findings served as the basis for participatory planning and the design of interventions using an integrated landscape approach that aligns with both ecological priorities and livelihood objectives (Singh et al. 2020).

FIGURE 1 | **SHG women having discussion in the courtyard of a traditional home in Sidhi**



Source: WRI India.

The approach and process for developing the pilot

This section outlines the phased approach adopted to design and implement the Sidhi landscape restoration pilot. This approach is anchored in evidence, policy alignment, and institutional partnerships. The process began with a district-level restoration opportunity assessment by adapting the ROAM methodology to identify high-priority areas and restoration interventions. These insights informed the development of a restoration roadmap for initiating a landscape restoration pilot, including site identification and intervention design, in Sidhi.

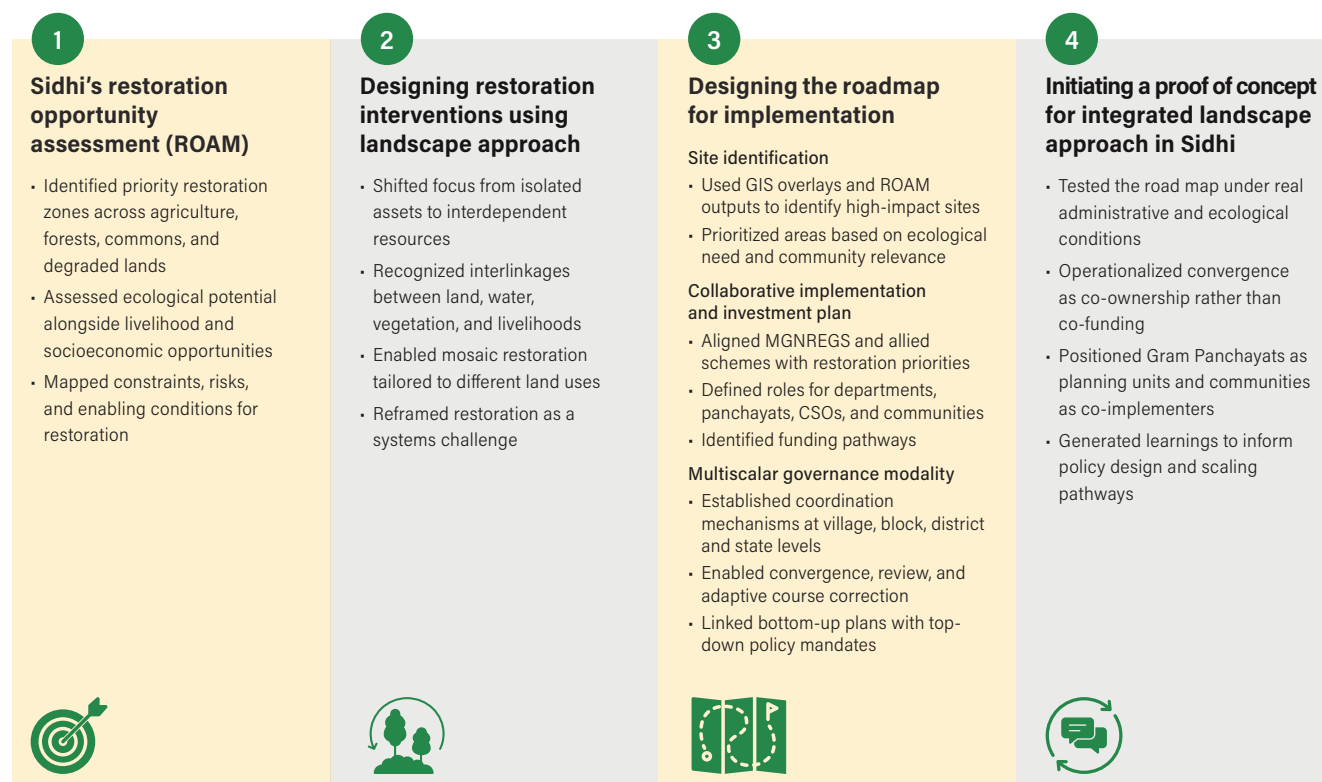
The approach emphasized early sustained engagement with government institutions, particularly the Panchayat and Rural Development Department (P&RD). Based on this alignment, a structured implementation plan was developed and operationalized through a local implementing partner, ASA, focusing on community mobilization, institutional strengthening, and coordinated on-the-ground execution (Figure 2).

Landscape opportunity assessment of Sidhi

The state of Madhya Pradesh has immense potential for forest protection and landscape restoration across more than 20 million hectares, specifically for mosaic restoration (in a patchwork of land uses) in 13 million hectares (Chaturvedi et al. 2018). This further underscores the need for landscape planning to unlock the restoration potential of Madhya Pradesh, starting with a pilot in Sidhi district (Figure 3).

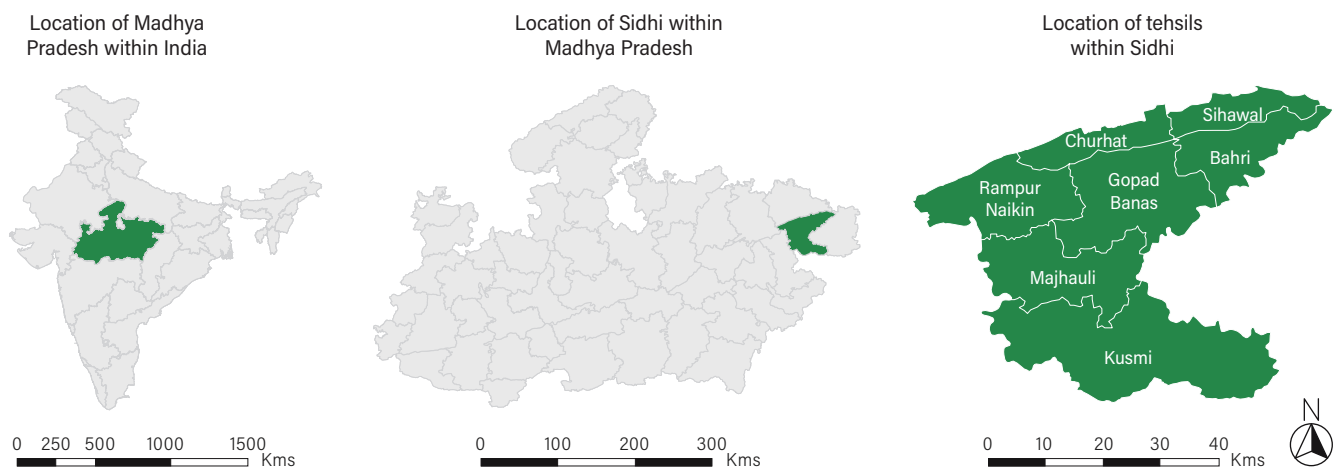
Sidhi, a remote district in eastern Madhya Pradesh in central India, is highly vulnerable to climate change, as reflected in the Climate Vulnerability Index. According to the National Climate Vulnerability Assessment Report by the Department of Science and Technology, vulnerability is defined across multiple factors such as the percentage of small and marginal farmers, lack of forest area per 1,000

FIGURE 2 | The approach and process for developing the pilot



Source: WRI India authors.

FIGURE 3 | Location of Sidhi district, Madhya Pradesh



Source: WRI India authors.

rural population, lack of groundwater availability, and so on. Sidhi is moderately vulnerable in socioeconomic and agriculture indicators (DST 2021). Rainfall variability, drought weeks, heat stress, and seasonal crop water stress are projected to increase toward the mid-century compared to current conditions, thus contributing to an increase in overall vulnerability (EPCO 2022). Most people in the district are economically dependent on forests, agriculture, and wage employment. The high incidence of poverty in the district can be explained by its major economic activity, agriculture; its productivity is low due to the undulating terrain and dependence on rainfed agriculture and traditional methods of farming (Maheshwari n.d.). With limited economic opportunities, Sidhi typifies the many resource-rich but financially poor districts in India. That is why the focus of the analysis was on the rural and climate-vulnerable Sidhi district of Madhya Pradesh.

The landscape opportunity assessment of Sidhi was done by adapting ROAM and undertaken between October 2016 and September 2017. WRI India led this participatory and consultative assessment with support from local partners, including the Institute of Livelihood Research and Training of Bhopal and the Centre for Environmental Law at Worldwide Fund for Nature India (WWF-India). Participants in stakeholder consultations include district and sub-district officers of various government departments including Department of Forest, Department of Agriculture and Farmers Welfare, Madhya Pradesh State Rural Livelihoods Mission among others. In addition, Watershed Committee members, farmers, farmer producer organizations (FPOs), NGOs and local communities were also consulted.

An inception workshop was conducted at the state level, followed by a series of sub-district workshops in Sidhi comprising a participatory mapathon using Collect Earth, interviews, and focus group discussions with stakeholders in Sidhi. For the consultations, we used participatory tools such as social network mapping, a restoration diagnostic tool, an ecosystem services diagnostic tool, and Collect Earth. WRI India combined insights from the consultations with spatial analysis using remote sensing and a geographical information system (GIS), a literature review, analysis of policies, ecosystem services, enabling conditions, and cost/finance for restoration (Figure 4).

The findings from the assessment in Sidhi indicate that 363,000 ha of land is suitable for different types of restoration interventions: mixed-species plantation; bamboo plantation; agri-horti-forestry; trees on boundaries; and so on. The findings indicate that realizing Sidhi's restoration potential could generate wage opportunities of 3.75 million person-days and generate INR 710 million (USD 7.76 million) in wage income over two years. The sale of saplings can generate an additional INR 592 million (USD 6.47 million). In 5-7 years, landscape restoration could also create over 3,000 micro-enterprises that provide jobs to 30,000 people—including women, youth, and landless people—through value chain development for five key restoration tree species: bamboo (*Dendrocalamus sp*, *Bambusa sp*), moringa (*Moringa oleifera*), aonla (*Phyllanthus emblica*), palash (*Butea monosperma*), and mahua (*Madhuca longifolia*).

The ROAM assessment findings also highlight that strengthening enabling conditions—such as secure tenure and resource rights, effective institutional coordination, and market linkages—is crucial for the full realization of restoration benefits. For instance, the governance

and management of regenerated bamboo forests can be improved by clarifying benefit-sharing mechanisms and ensuring tenurial security for the communities involved (Singh et al. 2020).

The assessment showed that forest-fringe communities are highly dependent on ecosystem services and vulnerable to climate risks and land degradation. It also demonstrated that an integrated restoration strategy—spanning water, soil, agriculture, and forests—is essential to address interconnected livelihood and ecological challenges. Insights into community dependence, tenure, and institutional barriers reveal that climate vulnerability strongly shapes both community participation and the effectiveness of restoration investments.

To operationalize these findings, the report (Singh et al. 2020) recommended four types of accelerators for Sidhi—policy, knowledge, technology, and market and business—to address the barriers to implementing and scaling restoration. These accelerators would collectively create a cohort of stakeholders—such as farmers, local entrepreneurs, businesses, and media—that can spur restoration and help develop restoration value chains, spark new economic opportunities, protect the environment, and support the flow of ecosystem benefits (Singh et al. 2020). Based on the outcome of the ROAM assessment, these recommendations were put into practice gradually to overcome several challenges in the Sidhi pilot and shape on-the-ground strategies. In brief, attempts have been made to strengthen the enabling policy ecosystem through restoration policy dialogues and

FIGURE 4 | Overview of components under the ROAM methodology



Note: ROAM = Restoration Opportunities Assessment Methodology.
Source: Singh et al. (2020, 23).

establish a robust governance modality; local capacities to implement restoration have been strengthened through targeted capacity-building; market linkages have been established through SHGs and FPOs; and access to technology has been facilitated for greater impact through local partnerships. The following subsections trace how different interventions were designed, phased, and grounded in local ecological and socioeconomic contexts, detailing the integrated and participatory landscape restoration strategy adopted and highlighting its core principles, key components, and operational mechanisms.

Adopting a landscape approach in Sidhi

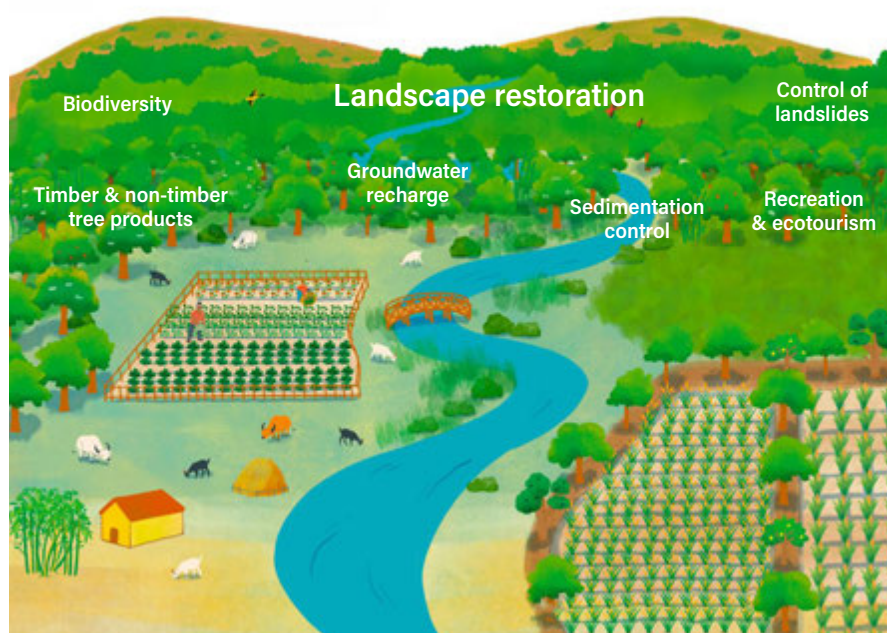
The landscape approach adopts a holistic, multidimensional view of achieving an area's social and economic development and environmental conservation by optimizing resource management and utilization. It emphasizes managing trade-offs such as balancing productive land uses with environmental conservation and biodiversity goals while seeking synergies between development and conservation efforts (Sayer et al. 2013). Central to this approach is placing people at the core of decision-making and bringing together key stakeholders to foster coherence in addressing challenges such as land degradation, natural resource conservation, and augmentation of local incomes and livelihoods.

In simple terms, the landscape approach refers to the integrated management of multiple land uses within a defined geographic unit that balancing conservation and development objectives (Kakani et al. 2024) (Figure 5). Landscape is “a social-ecological system that consists of a mosaic of natural and/or human modified ecosystems, often with a characteristic configuration of topography, vegetation, land use, and settlements that is influenced by the ecological, historical, economic, and cultural processes and activities of the area” (FAO 2022).

The ROAM assessment was carried out for the entire Sidhi district; despite its emphasis, on the tehsil and block levels,⁵ the scope of executing landscape restoration was narrowed down to a pilot cluster of 13 villages in Sidhi block to ensure that restoration interventions were implemented through community participation at the grassroots in a decentralized manner. Working at a smaller scale also allowed the project to test governance modalities; build local ownership; and generate demonstrable impacts on livelihoods, ecosystems, and climate resilience.

A collaborative implementation and investment plan helped further refine these insights. This plan involved identifying interventions tailored to specific land-use challenges and securing financing for each intervention (WRI India and ASA n.d.). The following subsection elaborates on the operationalization of the landscape

FIGURE 5 | Landscape approach to restoration



Source: WRI India authors.

approach and the key enabling factors that contributed to its success.

Roadmap for implementing landscape restoration in Sidhi

Following the Sidhi restoration opportunity assessment, the findings were shared with the Additional Chief Secretary, Panchayat and Rural Development Department (P&RD), Government of Madhya Pradesh (GoMP), in August 2020. This led to the department’s approval, in September 2020, for the development of a collaborative implementation plan to realize Sidhi’s landscape restoration potential. Recognizing the strategic importance of restoration, P&RD and WRI India formalized their collaboration through a memorandum of understanding (MoU) on November 9, 2020.

The MoU focused on integrating landscape restoration into ongoing government programs, including the MGNREGS, State Rural Livelihoods Mission (SRLM), and other relevant schemes in livelihoods and watershed development. Through this partnership, P&RD, WRI India, and Sidhi’s district administration aimed to implement restoration activities in the Sidhi pilot cluster of villages to develop a proof of concept and later scale up landscape restoration across Madhya Pradesh.

To strengthen the financial support for implementing restoration interventions, WRI India also collaborated with HSBC’s Climate Solutions Partnership—a

philanthropic collaboration launched in 2021 between HSBC, World Resources Institute (WRI), and World Wide Fund for Nature (WWF)—to accelerate the transition to a net-zero, resilient, and sustainable future by scaling climate solutions and removing barriers to their implementation (Figure 6).

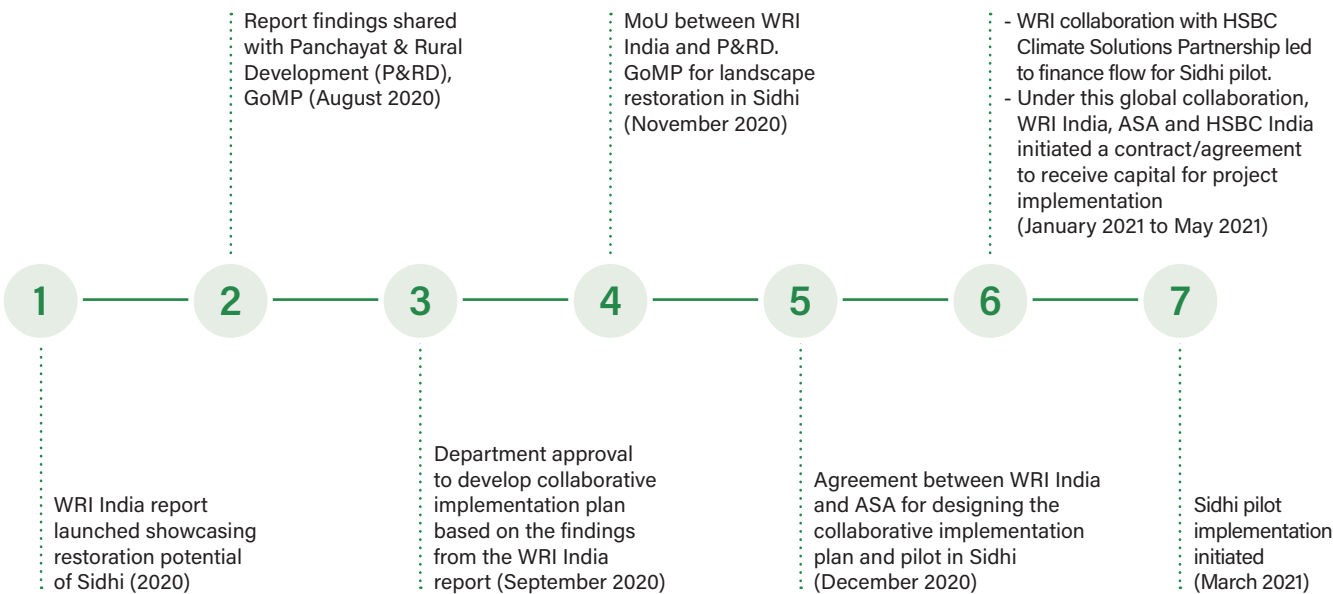
Designing an implementation strategy

The process of designing restoration strategies was multipronged, including selection of the pilot area, designing a collaborative implementation plan through participatory planning, collecting data and analyzing biophysical and socioeconomic indicators, establishing a governance modality, mobilizing the community, and consulting stakeholders. Each of these steps are described in the following subsections.

Selection of the pilot area and its key characteristics

Sidhi district in Madhya Pradesh has a predominantly rural and agrarian socioeconomic profile, marked by a significant presence of marginalized communities: Scheduled Tribes (STs) comprise 27.8 percent of the population and Scheduled Castes (SCs) 11.55 percent (Office of the Registrar General and Census Commissioner 2022). Agriculture forms the backbone of livelihoods, with 23.25 percent of the population engaged

FIGURE 6 | Timeline of steps followed in designing and executing the pilot



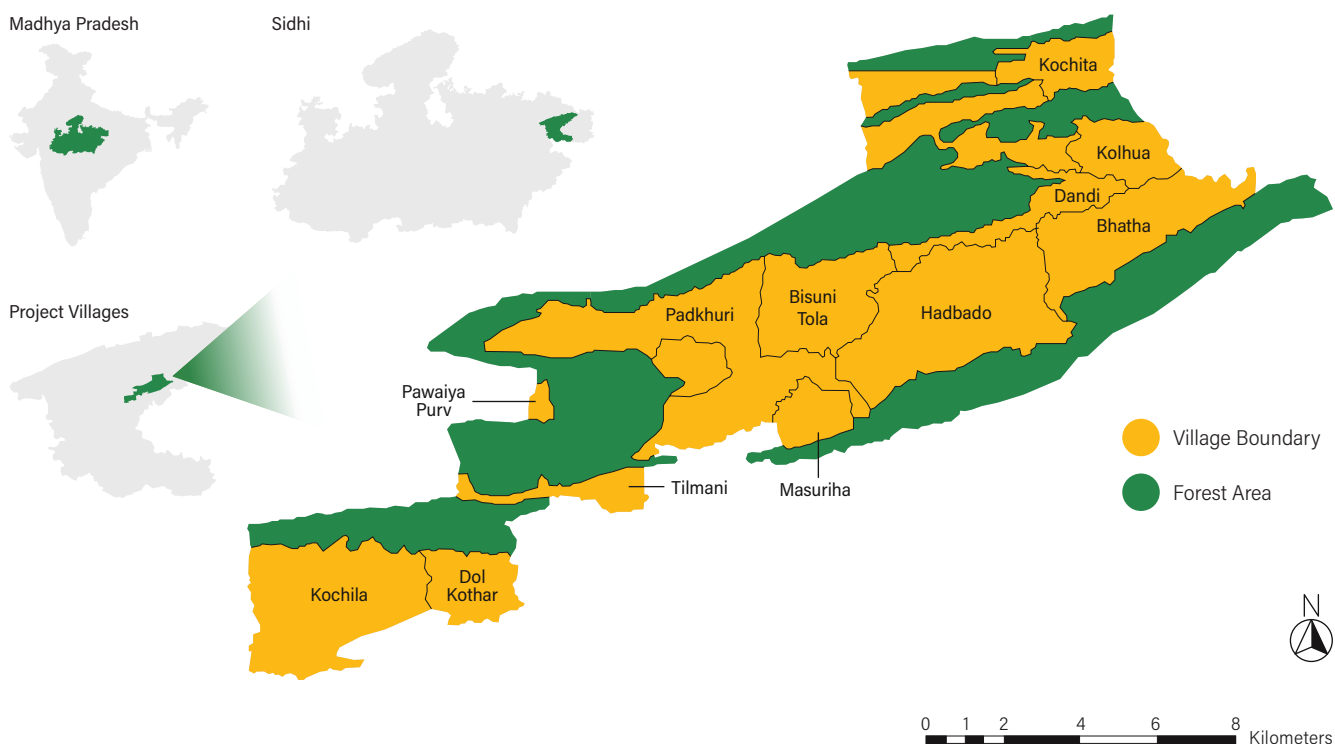
Source: WRI India authors.

as agricultural laborers—25.11 percent of men and 21.30 percent of women—and 35.66 percent of landholdings classified as small or marginal, reflecting a widespread dependence on subsistence farming and heightened vulnerability to environmental and economic shocks (ICRISAT-TCI 2020).

P&RD, in collaboration with WRI India and ASA, selected Sidhi block⁶ as a pilot site for landscape restoration in consultation with the district administration. A pilot cluster of 13 villages in Sidhi block was identified (see Figure 7). This cluster forms a contiguous landscape encompassing 9,043 ha of land as the total project area, which comprised 6,357.53 hectares of revenue land and 2,685.54 hectares of forest land. The 13 villages⁷ were selected based on undulating topography, poor soil health, capability to undertake watershed development by virtue of being situated in the upper part of drainage

systems, and the need for improving livelihoods because the majority of the population is marginalized, the STs comprising 51 percent of the total population. The main tribal groups of this region are the Gond, Kol, Panika, Baiga, and Pathari (Office of the Registrar General and Census Commissioner 2022).

FIGURE 7 | Location of project villages and forest boundary in Sidhi district prepared using ArcGIS



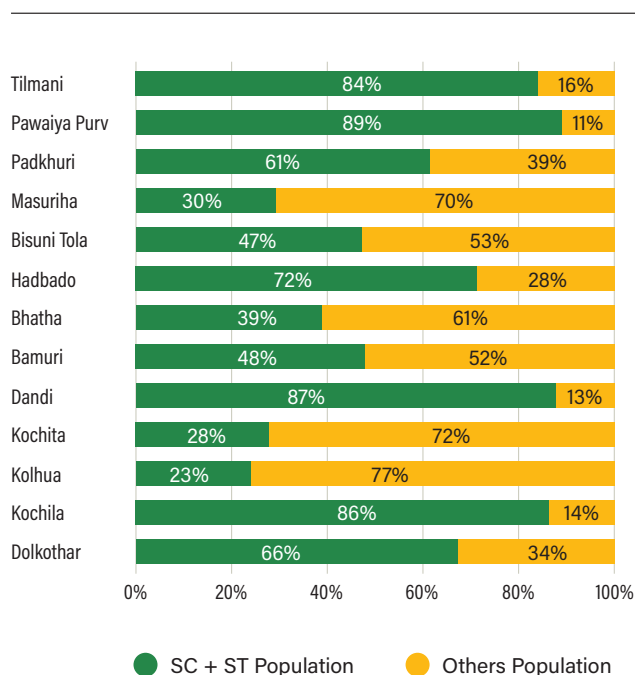
Source: WRI India authors.

Over the past decade, changes in forest cover and composition have significantly impacted forest-dependent communities due to decline in access to fodder and fuelwood (Singh et al. 2020). The convergence of agrarian pressure, marginal landholdings, and forest degradation underscores the need for integrated restoration approaches. The presence of active local stakeholders, a supportive district leadership, and a motivated community further strengthened the case for implementing and scaling nature-based solutions (NbS) in Sidhi. Some key characteristics of the pilot cluster are mentioned below.

High presence of STs and SCs

The high proportion of ST and SC communities in the selected villages highlights the need for restoration that strengthens livelihoods and resource security for vulnerable groups (Figure 8). Targeting these communities ensures that those most dependent on forests and natural resources directly benefit from improved ecosystem health and building community resilience against climate risks.

FIGURE 8 | Village-wise Scheduled Caste and Scheduled Tribe population in the pilot cluster



Source: WRI India and ASA n.d.

Farming is the main source of subsistence

Farming is the main source of subsistence in the selected villages, and about 75 percent of the households are involved in animal husbandry. Kharif (June to October) is the most important growing season, the principal crop being paddy. The main Rabi crop (November to May) is wheat. Most households cultivate marginal landholdings of around 1 hectare. Many villagers also farm under the *Bataidari* system (sharing crops), wherein a 50-50 share of the produce going to the landowners. The average output per hectare of most crops is low; most farmers cultivate traditional crop varieties, except hybrid paddy and wheat to a lesser extent, and depend solely on their own seeds for cultivation. This has led to loss of crop productivity. Agriculture is rain-fed, and sources of irrigation are limited in these villages (see Figure 9). Most of the crops are used for self-consumption; for these crops, formal marketing or value addition channels do not exist.

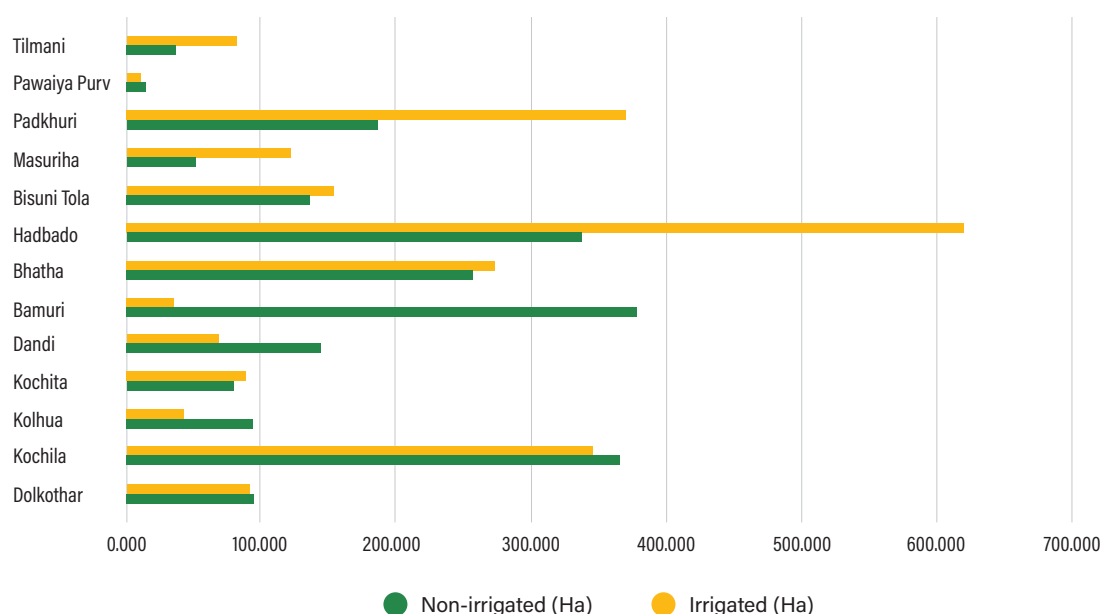
Developing a collaborative implementation and investment plan

The local implementation partner, ASA, conducted a series of focus group discussions, surveys, transect walks, and interviews with various stakeholders from the landscape, supported by a team with interdisciplinary expertise in forestry, civil engineering, spatial analysis, rural development, capacity-building, agribusiness, and community mobilization. Based on the findings from the stakeholder consultations, a collaborative implementation plan was formulated which provided a roadmap for on-site implementation of restoration interventions.

The stakeholder consultations conducted as a part of the implementation plan may be said to have four categories. One, WRI India adapted a restoration diagnostic card game (Hanson et al. 2015) to identify the presence and absence of key enabling conditions in Sidhi block (Appendix A presents the enabling factors that support landscape restoration in the pilot cluster of Sidhi). Two, we conducted opportunity mapping to identify the scope of potential restoration interventions in the pilot cluster. Three, we carried out livelihood assessment to identify the potential for developing value chains through FPCs. Four, we performed social landscape mapping of important stakeholders for restoration planning and execution in Sidhi (see Appendix B for a detailed analysis of the stakeholders).

Based on the stakeholder consultations (Figure 10), it was assessed that the pilot area in Sidhi block is rainfed, making the need for water interventions critical. Hence, the watershed approach emerged as a key entry point for implementing ecosystem restoration interventions in the pilot cluster. Because water interventions alone would

FIGURE 9 | Village-wise proportion of irrigated and non-irrigated areas



Source: WRI India and ASA n.d.

FIGURE 10 | Collaborative and participatory stakeholder consultations for designing pilot implementation plan

Social Landscape Mapping	• Village-level interface meetings organized in the pilot cluster with local farmers, Panchayati Raj Institutions (PRIs), and representatives of line departments from the Sidhi district administration. • Assessment of key challenges and needs amongst communities and other stakeholders from pilot region • Fragmented engagement across stakeholders was identified.
Opportunity Mapping	• Assessed interest of communities in undertaking specific restoration interventions • Mapped existing status of plantations, forest use, agriculture production and dependence of communities on natural resources • Identification of potential tree-based interventions for the pilot landscape and augmented with an assessment of the potential for watershed-related interventions, soil and moisture conservation, and sustainable agriculture and allied activities.
Livelihood Assessment	• Identified the percentage of the population involved in various livelihood activities. • Consultations with village- and cluster-level officials of key departments • Information collected on various crops and non-timber forest products (NTFPs) of the cluster and the marketable surplus available at the village level. • Potential identified for developing value chains by improving market linkages and establishing farmer producer companies (FPCs).
Restoration Diagnostic Card Game	• Adapted by WRI India based on research conducted by Hanson et al. (2015) was translated into Hindi and administered at village-level meetings. • Identified the presence and absence of key enabling conditions that support restoration.

Source: WRI India and ASA n.d.

not have enabled restoration, it was recommended that additional restoration activities be planned, which included activities related to soil and moisture conservation, water resource development, tree-based interventions on private and public land, protection for natural regeneration, as well as agriculture productivity enhancement interventions. This established an integrated landscape approach to restoration in Sidhi that focused on biodiversity conservation and livelihood enhancement (see Appendix C for more details on the restoration interventions identified for implementation in the pilot cluster in Sidhi).

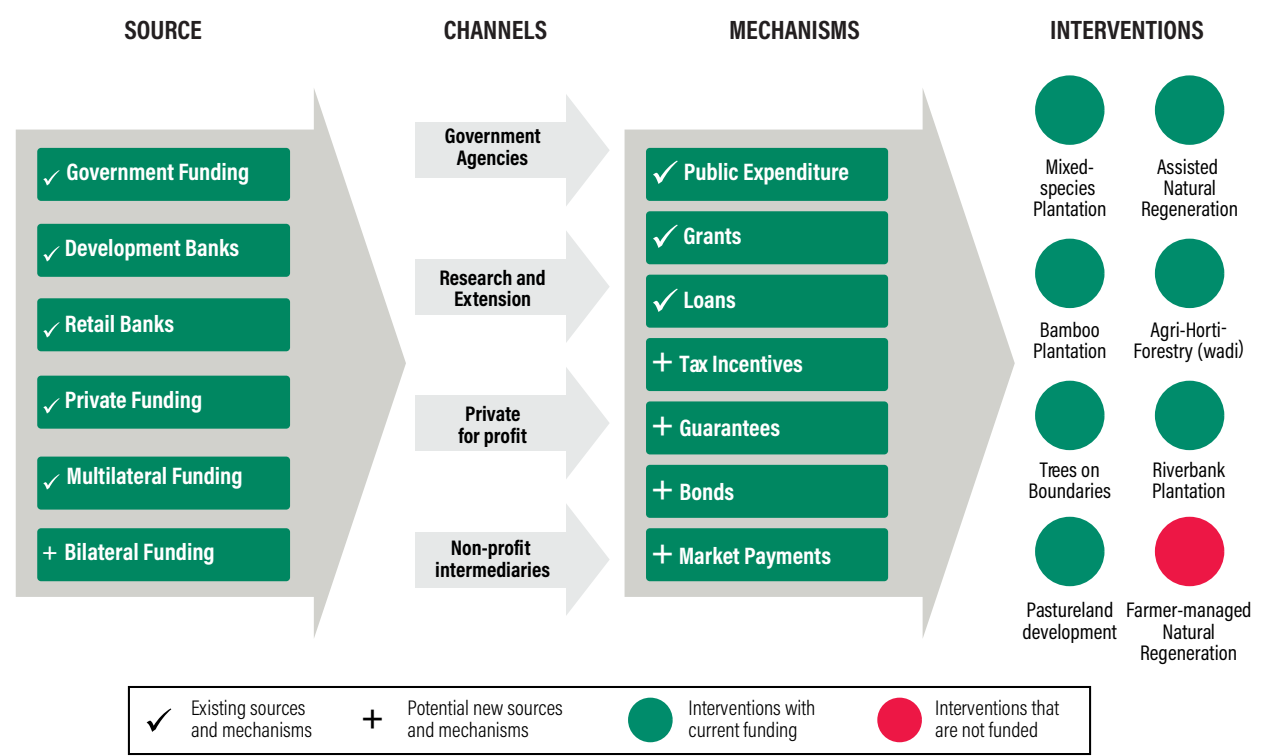
To finance the implementation of these interventions, an investment plan was developed for the pilot cluster in Sidhi block that detailed the costing of each intervention and the sources of funding. The cost of each intervention was assessed based on the type of land ownership, the implementing agency, the type of intervention, and the estimated cost per hectare used by various government agencies (Figure 11). A combination of public and private investment sources were identified such as loans, grants, and incentives (Singh et al. 2020). These sources of finance have shaped the financing of restorations in the Sidhi pilot. The pilot project successfully leveraged public funds during the implementation, which are detailed in the next subsection.

Governance mechanism for streamlined implementation

Built into the project design is a multi-scalar governance modality that contributes to the overall smooth functioning of the project. As part of this multi-scalar governance modality, a Steering Committee was constituted by the GoMP for this project in March 2021, with the Principal Secretary P&RD, as the chair of the committee. The Steering Committee was responsible for charting strategy, fostering convergence, and identifying opportunities for scale at the state level. At the district level, the district administration was designated the nodal agency by P&RD to oversee project progress and streamline bottlenecks in implementation (Figure 12).⁸

The district administration, supported by key line departments, demonstrated ownership of the project despite the routine administrative changes, primarily frequent transfers of government officials. A dedicated sub-committee chaired by the CEO, Zila Panchayat,⁹ alongside WRI India and ASA, was constituted to facilitate convergence and resolve implementation bottlenecks. Regular monthly reviews and field-level engagement with PRIs¹⁰ and farmers and women’s groups reinforced accountability.

FIGURE 11 | Financing restoration in Sidhi



Source: Singh et al. (2020, 67).
 Note: This is an illustrative list of funding sources for financing restoration as identified through the ROAM assessment. This image, adapted from Singh et al. (2020), highlights the potential funding sources analysed for undertaking restoration in Sidhi.

FIGURE 12 | Multi-scalar governance modality for streamlining implementation



Note: ASA = Action for Social Advancement. GoMP = Government of Madhya Pradesh. P&RD = Panchayat and Rural Development Department.
Source: WRI India and ASA (n.d.).

Initiating the pilot in Sidhi

Once the collaborative implementation plan was finalized and a governance modality established, WRI India—along with its implementation partner, ASA—initiated on-the-ground activities in the pilot cluster of villages. Implementation was supported through a blended financing model that combined CSR funding from the HSBC Climate Solutions Partnership with public funds mobilized from government schemes. To ensure accountability and adaptive management, quarterly progress reporting across project indicators and monthly review calls with partners and the district administration were established to address barriers and streamline

implementation. Both WRI India and ASA drew on their strengths in leveraging the policy and governance ecosystem to build momentum around NbS within governmental and CSO domains while also testing the integrated landscape approach through community-led models on the ground (WRI India n.d.).

This section has outlined the planning and design phases. The next section examines the key enablers that facilitated effective implementation and supported the delivery of the project’s intended outcomes.

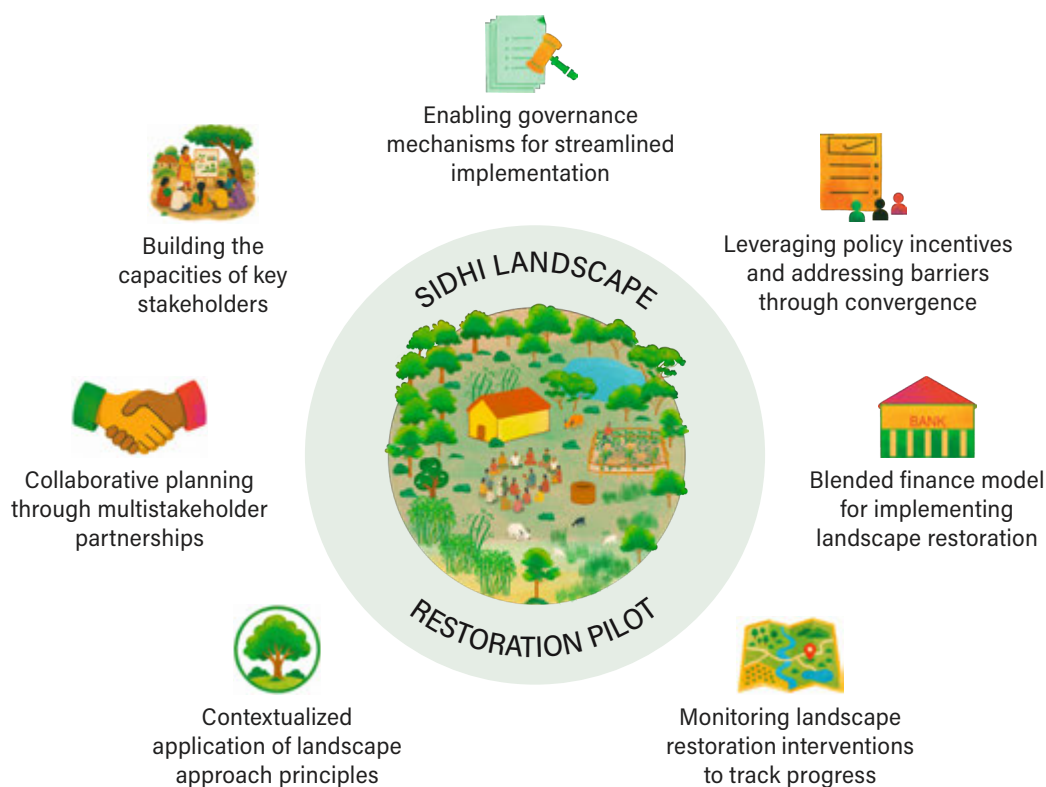
Key enablers in Sidhi's restoration journey

This section unpacks the programmatic, structural, policy, and institutional enablers that allowed the project to move from the planning phase to effective implementation. Some of these enablers include the adoption of landscape principles in project design, strong convergence with government departments, and collaborative partnerships with CSR donors and CSOs—which together created an enabling ecosystem that bridged policy, governance, and practice. The pilot demonstrated that landscape restoration requires more than just technical interventions; it depends on creating the right enabling environment. Restoration efforts succeed when there is institutional support, community ownership, and alignment with broader development priorities. In Sidhi, this meant mobilizing public resources and fostering cross-departmental collaboration. These enablers not only made the implementation possible but also ensured that the interventions were relevant to local needs, socially inclusive, and ecologically sustainable. This section describes in detail the key enablers identified and analyzed as a part of the pilot (Figure 13).

Contextualized application of landscape approach principles

The pilot on landscape restoration in Sidhi adopted a people-centered approach that was central to both the design and implementation of the interventions. Local communities, particularly marginalized groups, were actively engaged as key stakeholders and agents of change throughout the process. The pilot acknowledged the socioeconomic context of the region to ensure that the restoration efforts were inclusive and equitable. Diverse knowledge systems, ranging from traditional ecological understanding to scientific data, were integrated to design context-specific solutions. This approach also prioritized fair distribution of the benefits from restoration, with a strong focus on livelihoods, community participation, and ownership. Continuous monitoring, evaluation, and learning mechanisms were embedded to adaptively manage the pilot and build a foundation for scaling restoration across the state (Elias et al. 2021).

FIGURE 13 | Key enablers for the implementation of landscape restoration



Source: WRI India authors.

FIGURE 14 | Application of landscape approach principles for designing restoration solutions

Landscape approach principles	Sidhi Restoration Pilot
Continuous learning and adaptive management	Institutionalized governance modality; regular review meetings across state, district, and block
Common concern entry point	Water identified as common concern entry point for landscape restoration, implementation done through watershed principles
Multiple scales	Institutionalized governance modality at multiple scales across state, district, and block
Multifunctional uses of the landscape	Provision of multiple functions—livelihoods; water; soil; biodiversity; carbon; and food and nutrition
Multiple stakeholders	Government institutions, CSOs, PRIs, local user groups, private sector
Negotiated and transparent change logic	Long-term horizon, discussion of cost-benefit analyses and trade-offs among stakeholders
Participatory and user-friendly monitoring	Participatory, citizen science-based mobile application with geospatial monitoring framework for both socioeconomic and biophysical indicators
Clarification of rights and responsibilities	Clearly identified roles and responsibilities between government entities, local user groups, CSOs, etc.
Strengthened stakeholder capacity	Building CSO capacity through ROAM training; targeted capacity-building of grassroots-level stakeholders

Note: ROAM = Restoration Opportunities Assessment Methodology.

Source: WRI India authors.

Landscape restoration in Sidhi has been guided by 10 globally recognized principles of a landscape approach that serve as a flexible framework adapted to the region's specific ecological, social, and institutional context (Figure 14). These principles support transparent, informed decision-making that considers the diverse interests of the multiple stakeholders involved in land use and restoration. By fostering integration across policy areas and breaking down institutional silos, these principles create opportunities for coordinated action (Sayer et al. 2013).

The key principles applied in Sidhi include fostering continuous learning and adaptive management, promoting multifunctional use of landscapes, engaging with a wide range of stakeholders, strengthening local capacities, and identifying common-concern entry points to ensure that the restoration interventions are both inclusive and impactful. Integrating these principles into planning and implementing the Sidhi pilot is detailed in the next section on collaborative and inclusive planning, capacity-building of different actors, governance modalities for streamlined implementation, and monitoring measures. These principles also complement the components of the ROAM methodology that have been significant in the design of this pilot, such as institutional and stakeholder mapping, and a consultative and participatory approach to landscape planning.

Collaborative planning through multistakeholder partnerships

The project emphasized inclusive governance and collaborative decision-making. Civil society organizations (CSOs), government officials, and local communities were integral to the planning and execution of the interventions. At each stage, roles and responsibilities were clearly defined, allowing for efficient coordination and reducing conflicts or overlaps in activities.

Communities were seen not as passive recipients but as key partners who can steer decisions rooted in community priorities. Rather than focusing on what they lacked, the project recognized and built upon their deep understanding of the local ecology and environment. Their lived experience of managing land and water over generations enabled them to identify degradation issues such as declining groundwater, soil erosion, and loss of native vegetation not merely as environmental concerns but as interlinked livelihood and food security challenges. For example, in several villages, farmers recognized that traditional *dohas* (small water-harvesting structures) and contour bunding¹¹ had historically helped recharge groundwater and reduce soil runoff. However, these had fallen into disrepair due to the lack of institutional

support. Reviving such practices became a core component of the restoration plans and were implemented through the MGNREGS. In another instance, women's SHGs recalled the importance of mixed cropping and native millet varieties in sustaining yields during years of erratic rainfall. Their insights led to the inclusion of minor millets and drought-tolerant crops in the agrobiodiversity enhancement activities. These community-informed decisions not only made restoration efforts contextually relevant but also fostered greater ownership, thus improving the adoption of climate-resilient interventions.

The collaboration with CSOs played a pivotal role in providing technical support and specialized knowledge across various domains, ensuring that the interventions were scientifically sound and context-specific. This was ensured through ASA's long-standing expertise in water and land management practices that were leveraged in designing and implementing this project. ASA's collaboration with local departments further strengthened the convergence between erstwhile MGNREGS and other rural development schemes, ensuring that financial resources were mobilized efficiently. This model of multistakeholder collaboration ensured that the interventions were contextually relevant, financially viable, and socially inclusive—the key elements necessary in landscape restoration.

Building the capacities of key actors

In the Sidhi pilot, targeted capacity-building efforts were designed to strengthen the technical and institutional capabilities of the key stakeholders involved in the restoration. One key initiative involved training engineers from the Rural Engineering Services Department on GIS-based site selection and the technical design of soil and water conservation structures under the MGNREGS. These training sessions ensured that interventions such as farm ponds, check dams, and contour trenches were scientifically planned and executed.¹²

Simultaneously, community-based organizations (CBOs) such as SHGs and members of the PRIs attended orientation sessions on integrated natural resource management (NRM), land rights, and how to access government schemes. This helped enhance their ownership of the restoration process and built their ability to engage meaningfully in decision-making. Further, village-level training sessions led by ASA helped community members understand their entitlements under the MGNREGS, the process for generating work codes, and the documentation required to initiate and complete restoration works. These efforts not only improved transparency and participation

but also contributed to the increased community uptake of MGNREGS activities.

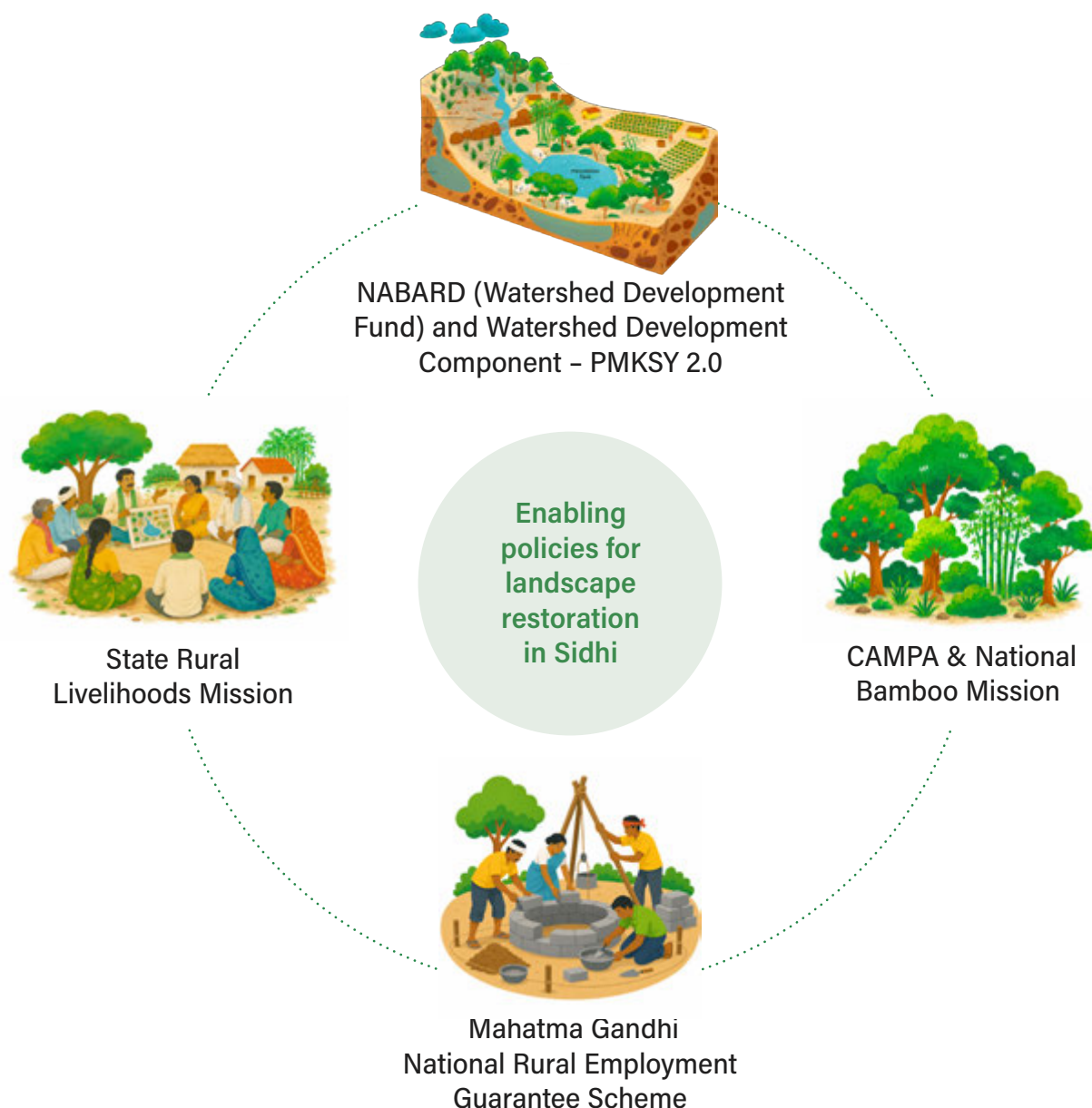
Enabling governance mechanisms for streamlined implementation

The governance structure of the Sidhi landscape restoration pilot successfully combines top-down policy support with bottom-up planning. A key strength of this model is the agency of the District Implementation Committee, which has the authority to approve restoration plans, monitor progress, and—along with the project team—support implementation on the ground. Decentralized decision-making has helped address local challenges quickly, build strong partnerships among departments, and keep communities engaged throughout the process. At the state level, regular Steering Committee meetings chaired by the former Additional Chief Secretary (ACS), P&RD, established a mechanism to track progress and resolve larger policy issues. These meetings also helped position the Sidhi pilot as a strong example of how NbS can improve both climate resilience and rural livelihoods. Importantly, this system has remained effective despite routine personnel changes in the district administration. The institutional setup across the state, district, and block levels helped new officials get up to speed quickly, ensuring that the work continued without disruption. Recognizing the role of district administration in planning and implementation of restoration interventions, the senior leadership at the state level is now working to scale the landscape approach to other districts in Madhya Pradesh.

Leveraging policy incentives and overcoming barriers through convergence

In the context of the Sidhi landscape restoration pilot, “convergence” refers to the coordinated planning and deployment of multiple public schemes to restore water, soil, and tree-based systems while strengthening rural livelihoods; a core strategy of the pilot initiative, convergence with government schemes enables a holistic, multistakeholder approach (Figure 15) (Appendix D mentions details of the resources and expertise leveraged from schemes such as MGNREGS, Watershed Development Component–Pradhan Mantri Krishi Sinchayee Yojana (WDC–PMKSY 2.0), NABARD, and the National Bamboo Mission). These policies were strategically leveraged due to their relevance and incentives for restoration-specific interventions in the pilot cluster, aligned with district-level planning and Gram Panchayat development plans through a participatory

FIGURE 15 | Enabling policy convergence for pilot implementation



Note: CAMPA = Compensatory Afforestation Fund Management and Planning Authority. NABARD = National Bank for Agriculture and Rural Development. PMKSY = Pradhan Mantri Krishi Sinchayee Yojana.

Source: WRI India authors.

planning approach (Appendix D, Table D2 gives details on the public funds leveraged through various government schemes). Key district officials such as the District Collector and CEO, Zila Panchayat played a vital role in coordinating departments such as the Department of Horticulture and Food Processing, Department of Farmers Welfare and Agriculture Development, and Forest Department, GoMP (Yadav et al. 2023).

While the pilot implementation was being carried out within a cluster of villages in Sidhi, there was a need to strengthen the policy environment at the state level to steer discussions around landscape restoration. In order to do this,

WRI India co-hosted the first Restoration Policy Dialogues with P&RD in September 2022 and the second one with Transform Rural India (TRI) and P&RD in August 2023, which spurred discussions around landscape restoration across government departments in Madhya Pradesh. The key outcomes of these dialogues highlighted, building state-level momentum, state-level momentum to scale learnings from the Sidhi pilot to other districts and a second tripartite MoU between WRI India, TRI, and P&RD signed on May 16, 2025 for state-wide scale-up of landscape restoration to additional districts in Madhya Pradesh. A series of meetings and consultations with government departments followed in a gradual process that culminated in the signing of the MoU.

BOX 2 | Case study: Restoring degraded forests in Sidhi through convergence and community action

In Sidhi district of Madhya Pradesh, a large, degraded forest area was identified in the pilot cluster for restoration but institutional barriers between the MGNREGS and the forest department hindered implementation. Legal ambiguity and lack of procedural clarity prevented MGNREGS funds from being used on forest-designated lands. To overcome this barrier, WRI India and ASA played a catalytic role by facilitating structured dialogues between the District Forest Officer and the district administration through District Coordination Committee meetings in 2022. This led to a convergence of schemes and departments, ensuring effective implementation through the following steps:

- Technical clearance from the forest department
- Funding for schematic components as well as wage payment through Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS) and Compensatory Afforestation Fund Management and Planning Authority (CAMPA)
- Community engagement via Gram Sabhas and Joint Forest Management Committees (JFMCs)

By leveraging schemes such as MGNREGS and CAMPA in convergence, two plantation models were implemented across four villages, demonstrating sustainable land use and restoration practices. The following interventions were executed:

- Bamboo plantations in eighty hectares of land across three villages, namely, Dandi, Bamuri, and Pawaiya.
- Mixed species plantations in forty hectares of land in Bhatha village.

Impact. The ecological restoration of 120 hectares of forest land under the project contributed to both environmental rejuvenation and community development. Livelihood generation was a key outcome, with local communities engaged in plantation and maintenance activities that provided much-needed employment. Furthermore, the initiative demonstrated an effective institutional collaboration model for landscape restoration; the model emphasizes inter-agency coordination and stakeholder participation to ensure that the interventions are sustainable in the long term. This initiative showcases how integrated planning, community participation, and institutional coordination can transform degraded landscapes into productive ecosystems while improving rural livelihoods.

Source: WRI India authors.

Although the pilot concluded in March 2025, the signing of a second tripartite MoU in May 2025 marked a transition from demonstration to scale, enabling the continued uptake of the landscape approach across the state.

At the district level, efforts have been made for carrying out landscape restoration interventions through a collaboration between erstwhile MGNREGS and the forest department (see Box 2).

Prior to the pilot intervention in Sidhi, MGNREGS work in the district was predominantly oriented toward standard labor-intensive activities (road maintenance and non-NRM tasks) rather than dedicated NRM activities. With the introduction of the pilot, however, a deliberate push was made to redirect MGNREGS allocations toward restoration-oriented NRM works such as plantation, soil and water conservation structures, watershed area treatment, and agroforestry interventions. This shift was enabled through convergence planning that involved the Gram Panchayats in consultations, secured sanctioning and approvals from the district administration, and optimized resource utilization by aligning budgets and timelines. As a result, there was greater adoption of NRM works under the MGNREGS in the pilot villages due to better awareness among stakeholders on

work categorization and improved landscape planning. This has helped ensure that restoration-linked work is no longer a marginal add-on but a core component of local MGNREGS planning and implementation, thereby increasing the ecological and livelihood impact of the scheme in Sidhi.

Blended finance model for implementing landscape restoration

Funding challenges in the project were addressed through a blended finance approach which combined CSR funding from HSBC India under the Climate Solutions Partnership with public financing mechanisms such as MGNREGS and convergence with other rural development programs such as watershed development and agriculture-related schemes.

The blended finance model implemented in the Sidhi pilot served as a catalyst for efficient and cohesive execution of landscape restoration efforts in rural regions. By combining the strengths of government schemes and CSR funds, the approach addressed both the scale and quality of the restoration interventions. Government schemes such as

MGNREGS provided the funding for labor-intensive activities like soil and water conservation, irrigation infrastructure, and plantation efforts. However, maximizing the restoration potential of these schemes often requires complementary support for technical expertise, innovation, and community capacity-building. Funding from HSBC India helped address these needs by supporting scientific planning, technical training for engineers, and community mobilization, among other activities. The model fostered alignment between grassroots needs and policy priorities, enabling more holistic, integrated, and resilient restoration outcomes across the rural landscape.

As a part of this blended finance model, for every USD 10 invested in restoration, USD 3 was contributed by CSR sources, and an additional USD 7 was mobilized from government programs. Over the duration of the project (March 2021 to March 2025), the total project expenditure amounted to INR 146.4 million (approximately USD 1.60 million), out of which CSR funding accounted for 32.48 percent of the total expenditure and public funds 67.52 percent. Of the total public funds, WDC-PMKSY 2.0 contributed 18.5 percent, and MGNREGS alone contributed 47.9 percent. This approach enabled strategic alignment between CSR investments and public funding streams, facilitating effective and timely implementation of interventions.

Monitoring landscape restoration interventions to track progress

Monitoring plays a critical role in ensuring the effectiveness of landscape restoration efforts by identifying implementation gaps and measuring the social and ecological impacts of the interventions. In the Sidhi pilot, a citizen science based monitoring application (see Appendix E for more details) was developed by WRI India to track implementation of restoration interventions across biophysical and socioeconomic indicators. This tool was tailored for various interventions particularly- tree plantations, soil and water conservation, and sustainable agriculture. The monitoring process involved community members in data collection through geotagging of project activity in the pilot cluster and GPS enabled survey forms. This involvement fostered local ownership and transparency while building accountability into the process. The data collected through the app not only provided real-time insights into intervention progress but also supported adaptive management by informing mid-course corrections and strategy refinement. This participatory approach to monitoring ensured that the restoration efforts remained aligned with community needs and ecological goals. The citizen science app was designed, piloted, and tested during the project, and it is being scaled up for other restoration-specific projects.

FIGURE 16 | **A farmer tending to a young fruit tree planted on his farm under the Sidhi landscape restoration initiative**



Source: WRI India.

Ecosystem services and co-benefits of restoration in Sidhi

Landscape restoration efforts in Sidhi have generated a range of ecosystem services,¹³ which in essence are the benefits that nature provides to people, alongside significant socioeconomic co-benefits. Interventions have contributed to improved soil health, enhanced water retention and soil moisture in farms, improved vegetation cover, and strengthened biodiversity across the landscape. These ecological gains have, in turn, supported agricultural productivity, diversified livelihoods through tree value chains, and improved food and nutritional security. At the same time, restoration interventions—particularly the construction of water conservation structures—have reduced climate vulnerability by enhancing resilience to erratic rainfall and extreme events while also building adaptation of local institutions and community ownership. Thus enabling more sustainable and long-term management of natural resources. Local stakeholders identified provisioning services, such as fodder and food security, and regulating services, such as erosion control and water recharge, as critical ecosystem services (Figure 17). Restoration interventions and their outcomes from the pilot cluster are detailed in Appendix F.

Regulating services

Biodiversity conservation, surface water and groundwater availability, and erosion control have been crucial ecosystem services in Sidhi. Interactions with communities revealed strong cultural ties to forests and traditional practices for protecting native tree species, which support local food, fuelwood, and NTFP needs. Responding to these priorities, diverse indigenous species such as mango (*Mangifera indica*), aonla (*Phyllanthus emblica*), guava (*Psidium guajava*), and lemon (*Citrus limon*) were planted across farmlands, contributing to biodiversity enhancement. Simultaneously, ridge-to-valley soil and water conservation measures—such as gully plugs, trenches, and field bunds—have ensured surface water conservation in pilot villages, slowed runoff, and retained soil moisture—as reflected in higher flows in stream channels and the improved availability of water in wells and farm ponds.

Provisioning services

A large proportion of the farmers in the pilot cluster are small and marginal, and the existing crop yields often do not meet household consumption needs. Dietary patterns

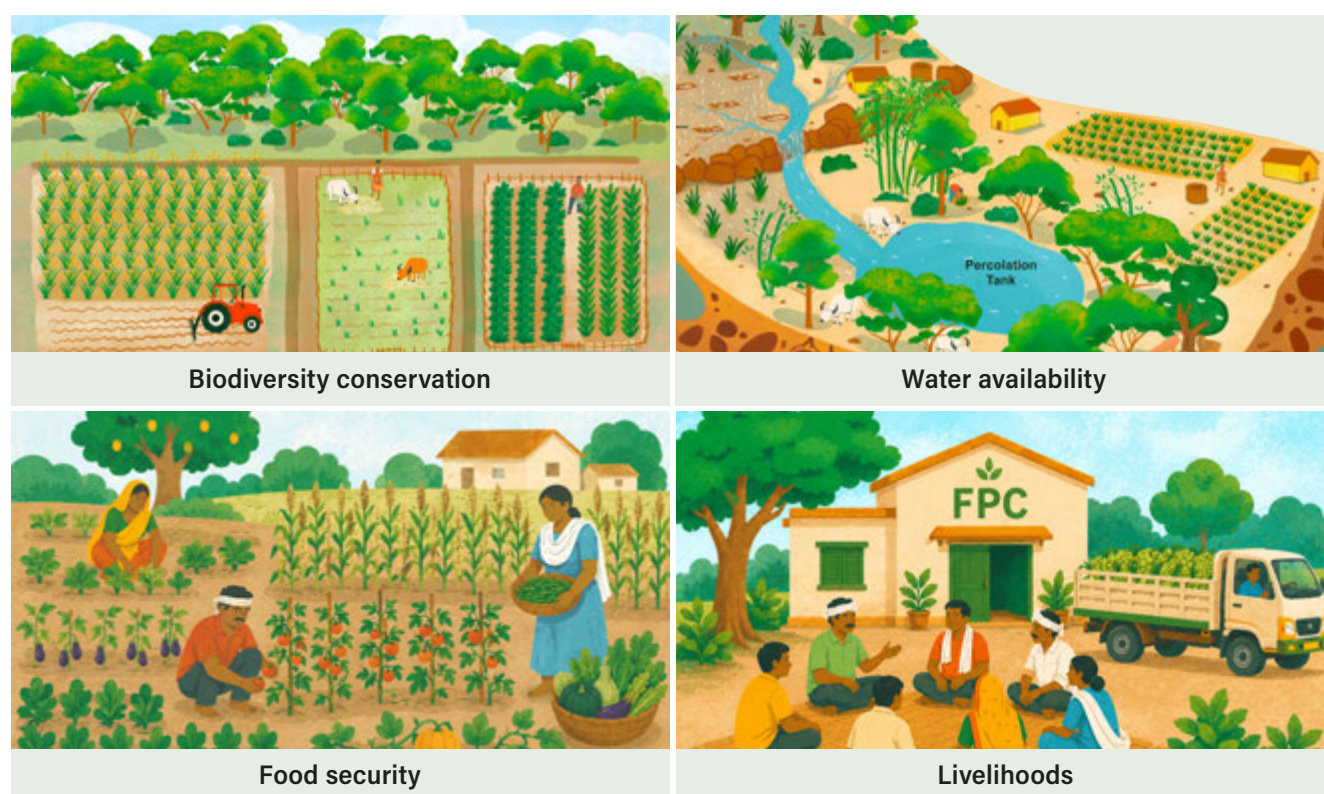
are largely shaped by what is locally and seasonally available, resulting in gaps in overall nutrition. To address this, targeted interventions such as the promotion of household vegetable gardens, improved access to quality seeds, participatory varietal selection, and frontline demonstrations were introduced. These efforts enabled the farmers to adopt more suitable and diverse crop varieties, improve cultivation practices, and integrate nutrition-sensitive crops into their systems. As a result, households were able to enhance crop productivity, diversify food intake, and improve overall food and nutritional security.

The socioeconomic benefits of the restoration interventions have strengthened the role of SHGs, enhanced local employment through MGNREGS NRM works, diversified community incomes by reducing their sole dependence on agriculture, and catalyzed tree- and agro-based value chains through the Gopadbanas FPC, ensuring that restoration outcomes translate into equitable and sustained livelihood gains (Figure 18).

The way these benefits are experienced and valued differs across gender and social groups. Men tend to prioritize ecosystem services that directly influence farm productivity and income—such as improved soil quality, irrigation availability, and crop yields. In contrast, women more often emphasize services that affect household well-being and daily labor, including easier access to fuelwood, fodder, water, and nutrition from kitchen gardens. Restoration interventions that reduce time spent on resource collection or improve access to diverse foods are particularly significant for women as these restoration interventions directly impact their workload and caregiving roles.

The differences in ways these ecosystem services are preferred by men and women are further shaped by caste and socioeconomic status. Households from marginalized groups, and landless and forest-dependent families, often rely more heavily on common lands and natural resources for subsistence, making them vulnerable to changes in ecosystem services such as fodder availability or access to forest produce. At the same time, their access to benefits may be constrained by limited land ownership, weaker institutional voice, and social barriers. This interplay of caste and gender highlights the need for restoration approaches that prioritize inclusivity, ensure equitable access to ecosystem services, and recognize the differentiated ways in which various groups depend on and benefit from restored landscapes.

FIGURE 17 | Flow of ecosystem services from implementation of restoration interventions



Source: WRI India authors.

BOX 3 | Strengthening farmer livelihoods through direct procurement and improved agronomy by the farmer producer company in Sidhi

The FPC, Gopadbanas Farmer Producer Company Ltd., which was promoted as part of the project, provided a direct procurement model that benefited 150 farmers across multiple villages in Sidhi block. By purchasing 906 quintals of wheat, 302 quintals of kodo millet, and 111 quintals of bamboo at the village level, the FPC helped farmers bypass intermediaries and secure better market prices. This shift enabled greater income at the household level and enhanced economic self-reliance.

Complementing the market access support, the FPC—along with the implementation partner, ASA—implemented 30 frontline demonstrations introducing improved wheat varieties such as GW-322, GW-273, and GW-366. These demonstrations provided farmers with both quality seed material and exposure to improved agricultural practices while also fostering local seed production for wider adoption. The initiative led to, on average, a 20 percent increase in wheat yields, contributing directly to improved farm profitability and resilience.

A farmer from Dolkothar village, Sarita Singh, said: "Earlier, our traditional wheat seeds yielded only 4–5 quintals per acre. With the GW-322 variety provided through the program, our yield increased to around 7 quintals per acre, which improved our income. We also sold 30 quintals of bamboo grown on our land and earned an additional INR 10,000 [USD 109.29], a first for our family. This support has given us the confidence and motivation to continue adopting better practices."

Facilitating restoration through FPCs enables communities to directly participate in and benefit from improved land management. By leveraging value chains, these efforts enhance rural livelihoods while reinforcing incentives for sustainable resource use. Together, they contribute to healthier ecosystems and long-term landscape resilience.

Source: WRI India authors.

BOX 4 | Bridging the irrigation gap through the construction of *dohas*

The availability of a steady supply of water for irrigation has always been a challenge in the rainfed areas of Sidhi. In the past, the fields would remain dry because of lack of water retention. A local farmer, Harilal who is primarily dependent on rain, would grow crops only during one season. But the construction of *dohas*— low-cost water-harvesting structures built along a stream to increase water availability and improve groundwater recharge—has ensured sufficient water that farmers can use for irrigation.

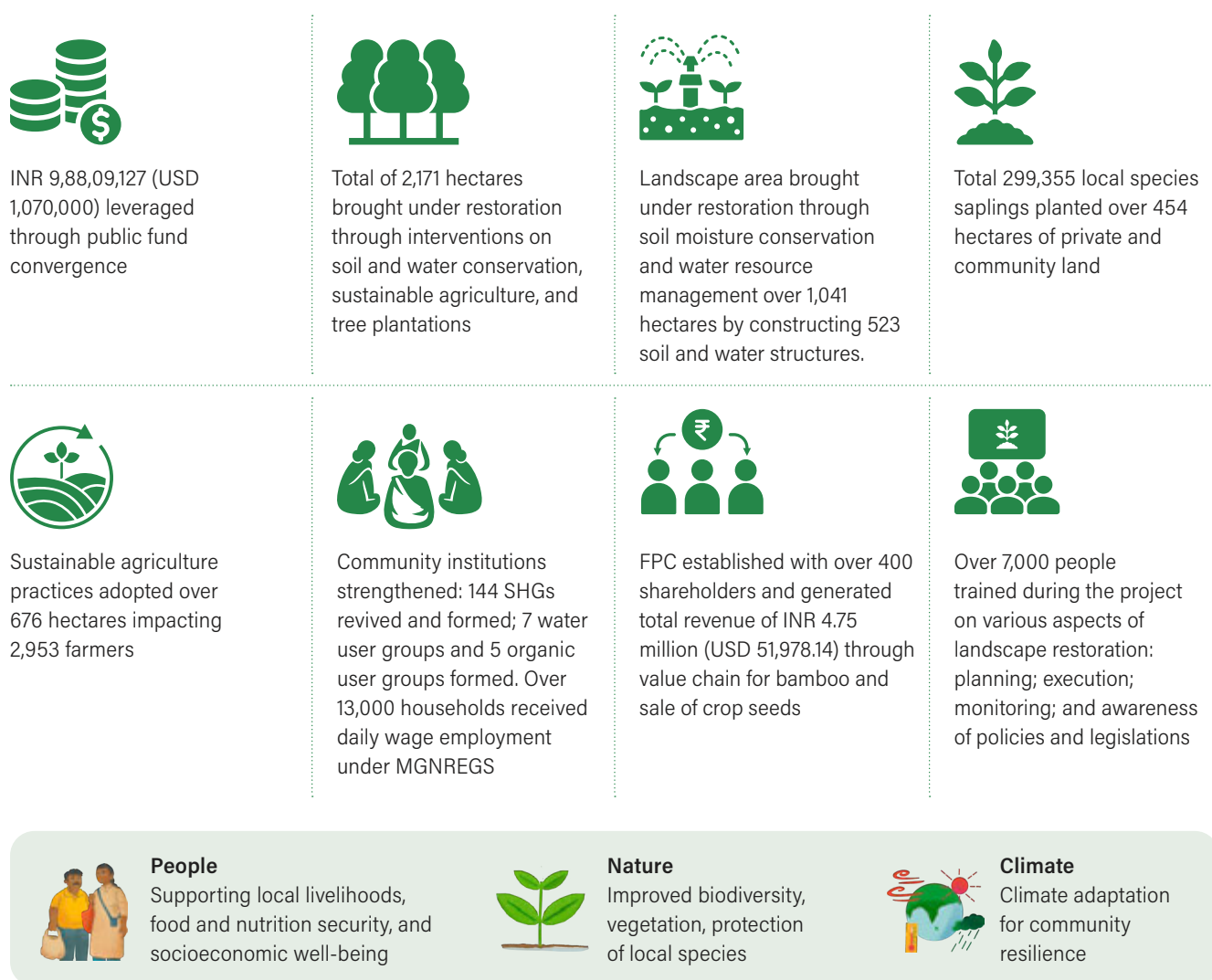
"Water earlier lasted only until January. It is now available until June," says Harilal. *Dohas* are ideal for areas with uneven terrain and help enhance irrigated farmland. "This initiative directly benefits around 200 families. Farmers are now able to harvest three crops a year, besides growing green vegetables," he says.

Over 100 *dohas* have been built as part of the pilot project, irrigating farms in 7 villages and restoring over 250 hectares of land. More than 400 structures—such as gully plugs, trenches, and *dohas*—have been constructed to harvest rainwater, recharge groundwater, meet irrigation needs, and reduce surface runoff.

Source: WRI India authors.

Note: *Dohas* are low cost water harvesting structures built along a stream to increase water availability and improve groundwater recharge

FIGURE 18 | Restoration outcomes in Sidhi for ecological conservation and livelihood enhancement



Source: WRI India authors.

Implementation experience: Challenges, lessons and insights

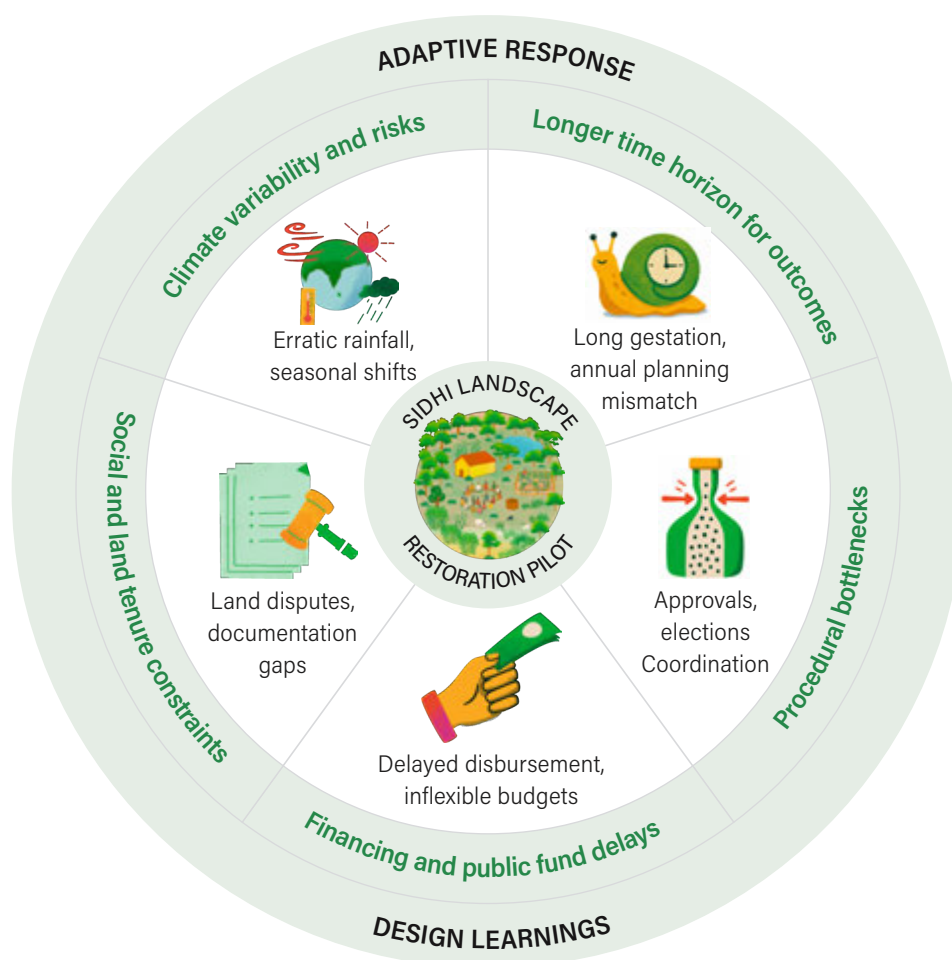
Implementation challenges from the pilot

The Sidhi landscape restoration pilot encountered a multifaceted array of challenges that allowed the viability and durability of integrated restoration initiatives to be assessed. Despite its comprehensive and collaborative approach, the project encountered challenges that can inform the planning and implementation strategies for scaling and replicating landscape restoration in other geographies (Figure 19).

Administrative and procedural bottlenecks

Several administrative and procedural challenges impacted the timely and effective implementation of the landscape restoration activities during the Sidhi pilot. A major setback was caused by a strike by PRI members—which delayed approvals, wage disbursements, and MGNREGS activities—because the frontline machinery responsible for implementation was unavailable. The enforcement of the Model Code of Conduct during elections further restricted the initiation of new works

FIGURE 19 | Implementation challenges from the Sidhi pilot



Source: WRI India authors.

and funding approvals. Additionally, delays in approvals from the district administration and line departments slowed project execution. The time-consuming nature of coordinating across departments and securing the necessary clearances for village-level development and restoration plans delayed the initiation of field-level interventions. These challenges were mitigated by securing the necessary approvals well before election periods, which helped avoid bottlenecks. Contingency planning and adaptable strategies ensured that the momentum was maintained during unforeseen disruptions.

Financing constraints for landscape restoration

A major challenge in implementing convergence-driven landscape restoration stems from systemic funding constraints and policy limitations. Under the Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS), the uncertain provisioning of funds and their erratic disbursement often leads to delayed payments, which disincentivizes the community members from undertaking labor-intensive restoration works. Schemes under NABARD and WDC-PMKSY 2.0 frequently operate with limited or inflexible budgets, making it difficult to mobilize timely support for critical activities such as water resource development, soil conservation, and agroforestry. These constraints hinder comprehensive, multisectoral restoration planning and point to the need for innovative financing models, such as public fund convergence strategies or blended finance. The pilot project adopted this approach, using CSR capital to bridge resource gaps and ensure consistent on-the-ground implementation.

Land tenure and land record

Land tenure and land records significantly influenced the implementation of the landscape restoration activities. Land encroachments and unresolved intra-family land disputes created barriers to identifying and planning priority lands—particularly common lands or degraded private holdings—for restoration. These disputes hindered the demarcation and allocation of land for interventions such as soil and water conservation, agroforestry, or plantation activities. Furthermore, a substantial number of potential beneficiaries lacked proper documentation or official land records, which made them ineligible for accessing benefits under key government schemes, such as MGNREGS, WDC-PMKSY 2.0, and horticulture and forest department scheme subsidies. As a result, even though these individuals often resided in ecologically vulnerable areas and were willing to participate in landscape restoration activities, they had to be excluded

from restoration planning, because they did not possess formal documents of ownership or tenancy.

Climate variability and extremes

Increasing variability in rainfall patterns has emerged as a major climatic challenge impacting the implementation of landscape restoration activities in Sidhi district. The region has been experiencing irregular monsoons, characterized by either early or delayed onset of rains, longer dry spells, and sudden heavy downpours. These shifts disrupt traditional agricultural calendars and affect the timing and effectiveness of restoration interventions such as tree plantations. For instance, in 2023, Sidhi was among the districts most severely impacted by inadequate rainfall, which significantly hampered the original plantation schedule planned for June. In response, plantation activities had to be rescheduled to align with more favorable soil moisture conditions, thereby improving the chances of sapling survival. This adaptive planning was adopted during the pilot to mitigate climate risks and integrate climate resilience into restoration efforts, highlighting the importance of flexible implementation timelines and climate-informed decision-making to sustain restoration gains under changing weather patterns.

The time-intensive nature of restoration outcomes

A key challenge in implementing landscape restoration is the inherently long gestation period required for interventions to yield visible ecological and socioeconomic outcomes. Restoration activities often take several seasons or even years before producing tangible benefits become apparent. This delay can impact stakeholder motivation and community participation, especially when short-term gains are minimal or difficult to demonstrate.

Landscape restoration requires coordinated investments over multiple years and across seasons. However, government funding mechanisms are often designed around annual budgets, scheme-specific activities, and short-term targets. This creates challenges in sequencing restoration interventions, aligning fund flows with seasonal requirements, and sustaining support over the longer time frames needed to achieve restoration outcomes. For example, plantation activities identified through village-level planning in Sidhi required the timely convergence of MGNREGS for site preparation and labor, along with support from forest or horticulture schemes for planting material and subsequent maintenance. Delays or mismatches in funding timelines often made it difficult to implement these interventions as planned.

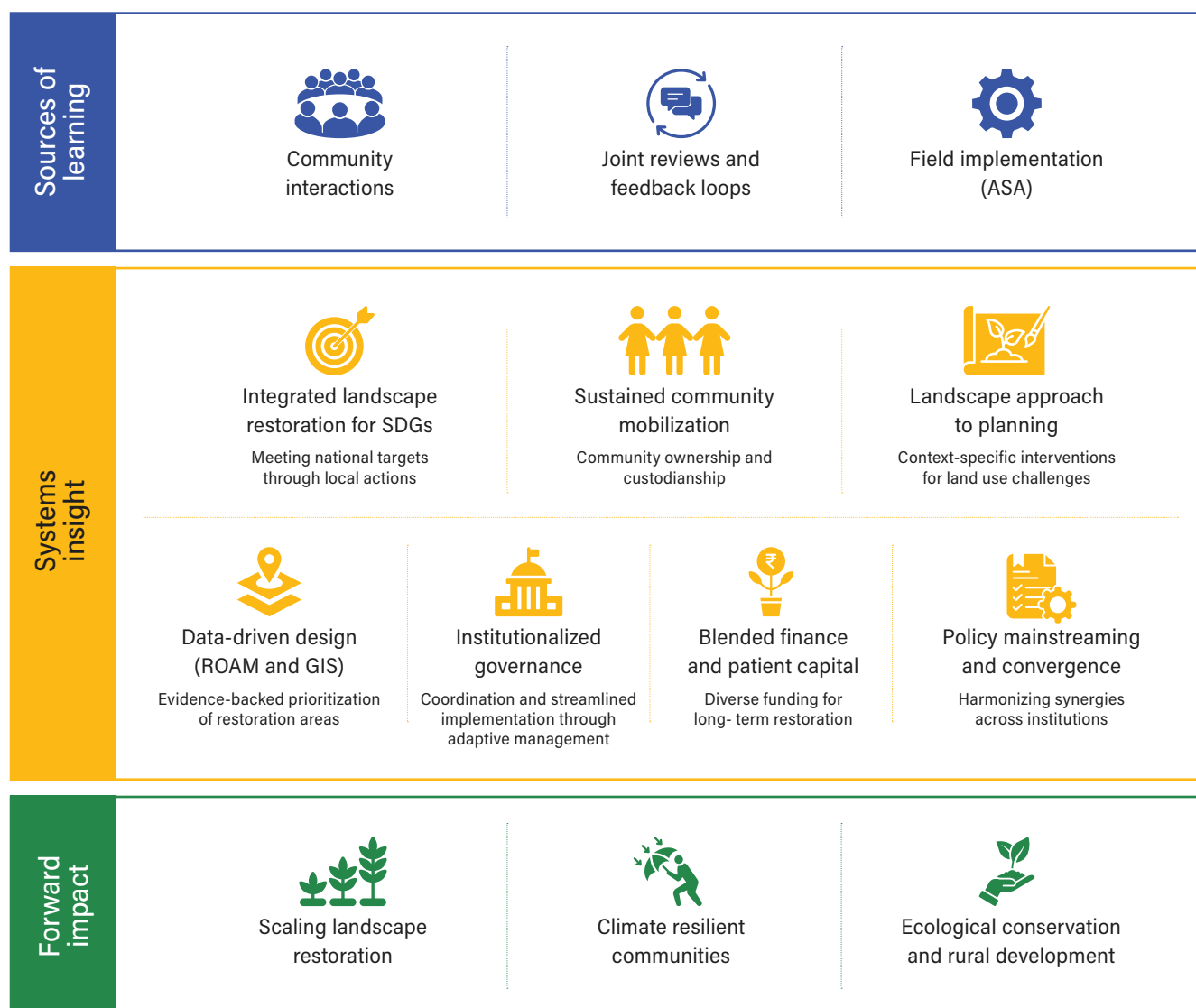
Key insights and learnings from the pilot implementation

The learnings underscore the importance of context-specific strategies that are tailored to the ecological, institutional, and socioeconomic realities of Sidhi district. The insights and strategic learnings from the pilot were derived from a combination of field-level experiences documented by our implementation partner, ASA, and community interactions that highlighted local needs, practices, and challenges. Significant learnings have also emerged regarding the larger role of NbS—such as the landscape restoration—in meeting the SDGs, ensuring rural development through alignment with local priorities, and obtaining diverse sources of finances to

meet landscape goals. Regular joint reviews, participatory planning sessions, and feedback loops between WRI India, ASA, and community members helped surface learnings on critical aspects such as community mobilization, landscape-level planning, and the value of integrated approaches to restoration. Incorporating these insights into future initiatives can enhance efficiency, resilience, and long-term impact (Figure 20).

- **Adopt integrated landscape restoration as a means of making progress toward the SDGs at the national and subnational levels:** A key learning from the Sidhi pilot is that integrated approach to restoration can serve as a bridge between local action and national commitments such as the SDGs, climate adaptation, and poverty reduction. Landscape restoration

FIGURE 20 | Key insights and learnings from the pilot implementation



Source: WRI India authors.

contributes directly to SDG 1 (No Poverty), SDG 2 (Zero Hunger), SDG 13 (Climate Action), and SDG 15 (Life on Land). It improves soil health, water availability, biodiversity, and ecosystem productivity while strengthening food security and climate resilience. The Sidhi landscape restoration initiative demonstrates how integrated interventions across soil and water conservation, sustainable agriculture, and tree-based restoration can generate multiple benefits for communities and ecosystems simultaneously. By improving livelihoods, strengthening NRM, and enhancing resilience, such approaches support holistic rural development while advancing progress towards multiple SDGs.

- **Sustained community mobilization enables better ownership and participation:** Community mobilization in Sidhi went beyond one-time consultations and was anchored in strengthening existing grassroots institutions such as SHGs, FPCs, and water user groups.
- **Adopt the landscape approach for restoration planning:** The landscape approach shifted planning from isolated plot-level activities to a broader systems perspective, allowing interventions to be designed according to how land, water, and vegetation interact across the terrain in Sidhi. This helped identify priority zones for soil and moisture conservation, recharge, and productive land use. By viewing the landscape as an interconnected unit rather than a collection of individual sites, the pilot established a more coherent and ecologically grounded restoration strategy.
- **Use research and data to map restoration areas and design solutions:** Findings from the ROAM assessment provided a robust, data-driven foundation for targeted restoration planning. By systematically identifying degradation hotspots and prioritizing areas with the highest ecological and livelihood potential, the assessment guided site-specific interventions. GIS-based analyses of land use, soil, and water resources enabled the design of restoration measures that are grounded in evidence rather than based on assumptions.

- **Mainstream landscape restoration within the policy ecosystem:** To build momentum for NbS such as landscape restoration, it is important to highlight the overlapping objectives of landscape restoration with government schemes when it comes to meeting the goals of ensuring water availability, creating livelihoods, or building the climate resilience of communities. Instead of treating restoration as a separate activity, it should be linked with schemes such as MGNREGS or PMKSY and positioned as an approach to support policy implementation. When government departments see that working together on land restoration helps everyone meet their targets faster, collaboration becomes natural rather than forced.
- **Landscape restoration cannot rely on a single funding stream; it requires a blended and coordinated financing strategy:** When the release of public funds is delayed or rigid budgetary rules in schemes hamper the flow of funds, it becomes crucial to have multiple channels of financing. Future initiatives must actively integrate public schemes, private investments, and civil society contributions to mobilize resources at scale. Strengthening local enterprises and producer groups as green business actors can further anchor restoration in rural economies, provided they are linked to incubators and responsible investors.
- **Communicate transparently and strategically with funders when working on long-term, system-level change:** Landscape restoration requires sustained investment before yielding tangible outcomes, it is essential to set clear interim milestones and track both quantitative progress and qualitative shifts. Developing timely knowledge products and maintaining an ongoing dialogue with donors helps build their confidence in the process. This also creates opportunities to advocate for patient capital: funding that recognizes the value of slow but transformative impact.

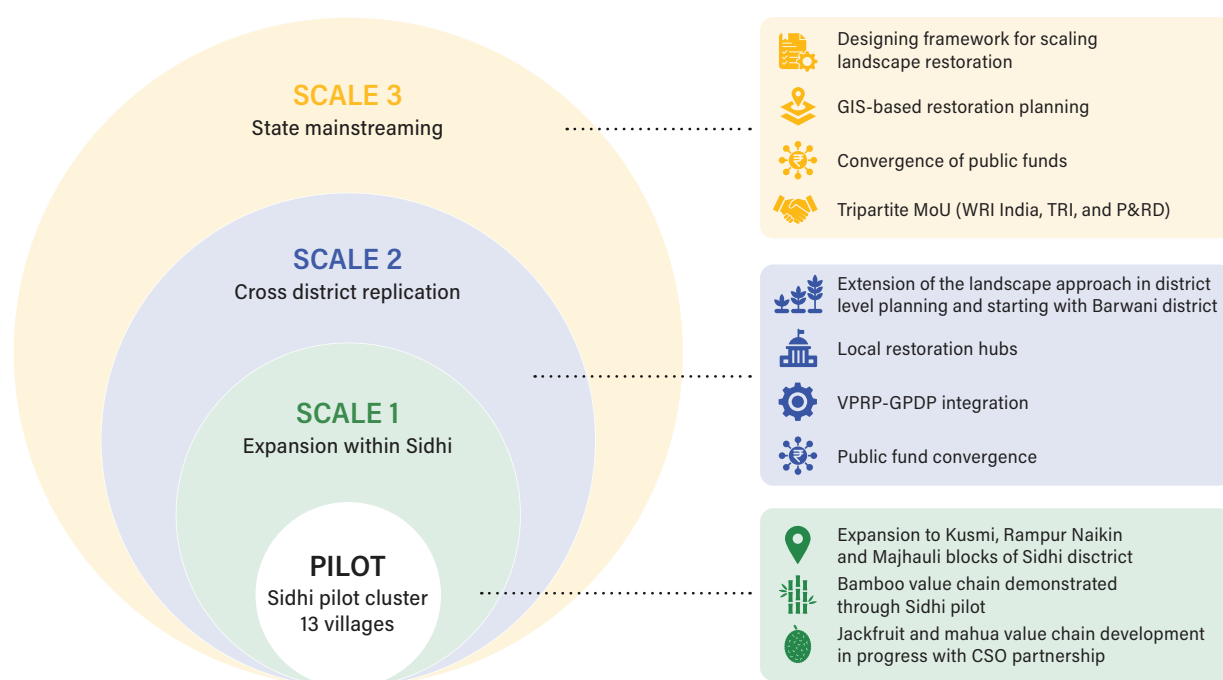
The way forward

The pilot restoration initiative implemented in Sidhi block of Sidhi district, Madhya Pradesh, has successfully streamlined previously fragmented restoration efforts and enabled synergistic convergence of public funds through government schemes in the state. It has also established positive feedback loops between on-the-ground implementation and policy-level interventions, helping overcome key barriers to restoration. By doing so, it has established a strong foundation for long term systemic change by addressing complex, cross-cutting challenges such as multistakeholder coordination, public sector engagement, and land use challenges. Moving forward, there is a need to scale this work to other blocks within Sidhi district to unlock the full potential of restoring over 300,000 ha, primarily outside forest areas (Singh et al. 2020). This can be achieved through landscape approaches tailored to specific geographic and ecological contexts, enabling the mobilization of blended capital to achieve integrated outcomes for people, nature, and climate.

This practice note traces a deliberate progression from pilot to scale across three nested levels. The first is within Sidhi district, where lessons from the pilot cluster in Sidhi

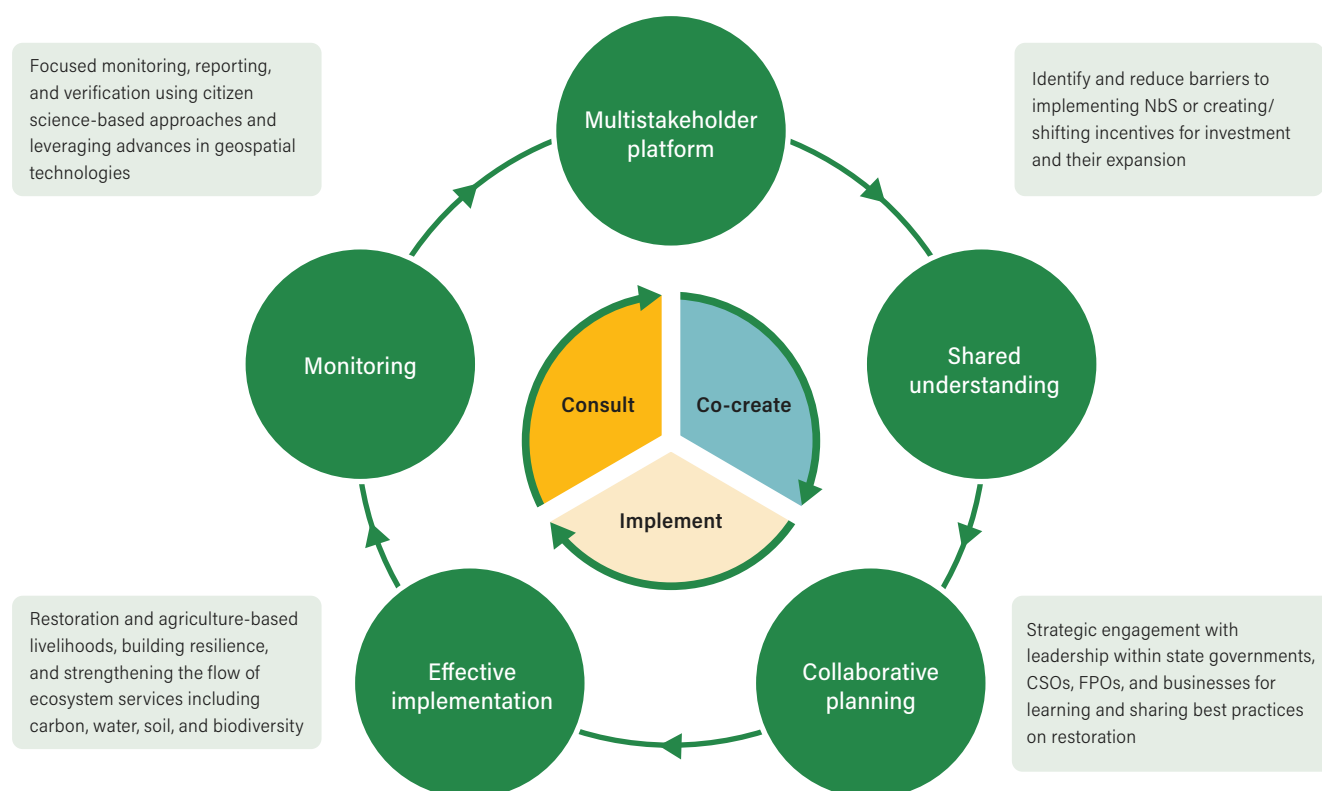
block are being extended to three additional blocks—Kusmi, Rampur Naikin, and Majhauri—covering more than 30 Gram Panchayats. The second is across districts in Madhya Pradesh, where the integrated landscape approach is being embedded within ongoing gram panchayat planning processes, including the integration of Village Prosperity Resilience Plans (VPRPs) with Gram Panchayat Development Plans (GPDPs),¹⁴ so that restoration becomes part of routine rural development planning rather than a standalone intervention. The third, and most systemic, level focuses on state-level institutionalization. Here, the Steering Committee chaired by the Additional Chief Secretary, P&RD, with support from the Madhya Pradesh State Employment Guarantee Council (MPSEGC), has recommended the expansion of the landscape approach to additional districts through collaborative partnerships under the second tripartite MoU signed in May 2025. Together, these three levels outline a pathway for translating a localized pilot into a scalable and institutionalized model for landscape restoration (Figure 21).

FIGURE 21 | **Scaling pilot learnings across Madhya Pradesh**



Note: VPRP= Village Prosperity Resilience Plan. GPDP= Gram Panchayat Development Plan. TRI= Transform Rural India. P&RD= Panchayat & Rural Development.
Source: WRI India authors.

FIGURE 22 | Holistic approach to scaling nature based solutions



Note: NbS = nature-based solutions.

Source: Adapted from Denier et al. (2015).

Scale 1: Expanding restoration to adjacent blocks within Sidhi

Building on the success of the pilot, restoration efforts are being expanded beyond Sidhi block to additional Blocks—including Kusmi, Rampur Naikin, and Majhauri—covering more than 30 Gram Panchayats across the district. This expansion is being undertaken through partnerships with local CSOs and continued support from the district administration with the objective of strengthening both institutional and community ownership of restoration. Alongside ecological interventions, efforts are underway to strengthen market linkages and restoration-positive value chains that can support sustainable livelihoods. Developing viable market models and strengthening supply-chain linkages will be critical to ensuring that restoration generates long-term economic opportunities for local communities while sustaining restoration outcomes. Findings from the ROAM assessment in Sidhi suggested value chain interventions could lead to development of microenterprises around six tree species: aonla, bamboo, jackfruit, mahua, moringa, and palash. During the

Sidhi pilot, value chain development for bamboo was demonstrated. As a part of scaling the pilot learnings to adjacent blocks, value chains for two additional tree species, jackfruit and mahua, are being developed with CSO support in the region.

Scale 2: Extending the landscape approach to other districts in Madhya Pradesh, beginning with Barwani, through Local Restoration Hubs and district-level planning integration

The next phase of scaling focuses on strengthening enabling conditions for landscape restoration by integrating restoration priorities into district-level planning processes. Building on lessons from Sidhi, efforts are underway to align restoration objectives with community-led planning instruments such as VPRPs and GPDPs while promoting convergence across public funding streams. Collaborative partnerships remain

central to this approach. Through Local Restoration Local restoration hub meetings are convened periodically with TRI's support in Barwani district. The hub is a platform that brings representatives of CSOs together to identify landscape-level challenges, co-design restoration solutions, and integrate these solutions into local development planning. Local stakeholders are being convened to identify landscape-level challenges, co-design restoration solutions, and support their integration into local development planning. Embedding restoration within existing planning and financing mechanisms can help move restoration from project-based implementation to a more sustained and institutionalized development approach.

Scale 3: Institutionalizing the landscape approach within state architecture

The Steering Committee chaired by the ACS, P&RD, has identified landscape restoration as a priority area for convergence and scaling under the second tripartite MoU signed in May 2025. Achieving this requires moving beyond pilots and establishing a standardized framework that can be integrated into state systems and replicated across geographies. The Sidhi pilot provides both the evidence base and practical lessons needed to inform such a framework. The emerging strategy emphasizes planning anchored in community-level development plans; intra- and inter-department coordination; the convergence of public funds; engaging local CSOs as technical partners; building on-the-ground momentum among stakeholders for landscape restoration; identifying key levers to enable supportive conditions; and using GIS-based approaches

for identifying restoration opportunities. This approach will enable us to engage with multiple government agencies and policymakers, collaborate with various NGOs, and build complementary partnerships to address socioeconomic and governance challenges, ultimately addressing policy barriers and mainstreaming landscape restoration within the policy ecosystem (Figure 22).

The current engagement with the Government of Madhya Pradesh seeks to build on this momentum by supporting the P&RD Department in translating lessons from Sidhi into policy-backed restoration strategies. This includes identifying institutional roles and responsibilities, developing pathways for scaling restoration across districts, and strengthening mechanisms for convergence and coordination. Restoration dialogues convened at the state level continue to bring together government agencies, civil society organizations (CSOs), technical experts, and development partners to foster shared learning and collaborative action.

Looking ahead, continued implementation in Sidhi—combined with efforts to embed restoration within planning, financing, and governance systems—can help establish a replicable model for landscape restoration in Madhya Pradesh. A standardized framework—supported by multi-stakeholder partnerships and integrated planning processes—can enable restoration to move from isolated interventions to a core component of rural development and climate action. Such an approach has the potential to deliver a triple dividend: restored landscapes, strengthened livelihoods, and long-term climate resilience.

Appendix A. Analysis of enabling factors through the restoration diagnostic tool in the Sidhi pilot cluster

Findings from the analysis of enabling conditions show that many of the success factors are absent or need strengthening in the pilot villages (Table A1).

TABLE A1 | **Status of enabling factors in the Sidhi pilot cluster**

ENABLING FACTORS	STATUS	OBSERVATION BY THE SURVEY TEAM EXPERTS
Economic benefits	Absent	With the exception of employment generation, the community does not appear to be aware of the economic benefits of landscape restoration.
Social benefits	Absent	The community was not aware of the relationship between landscape restoration and their social life.
Environmental benefits	Present	The community agreed that large-scale deforestation has affected the beauty of the landscape and that the intervention can bring back its past glory.
Communication of benefits	Present	Even though the community was not aware of the intended impact of the intervention, they were optimistic about its monetary and other tangible benefits because it was portrayed as a pilot project for a major government initiative.
Identification of target areas	Present	The community was able to identify land patches where plantations and forestation activities could be undertaken.
Threat of natural disaster	Present	No major natural disaster was recorded in the project area. The community did not identify risks such as landslides or floods.
Awareness of laws or policies for landscape restoration	Absent	Neither the community nor local government officials were aware of landscape restoration policies.
Ecological conditions	Present	The ecological conditions (climate and soil) are favorable enough to undertake landscape restoration activities.
Low presence of invasive plants	Present	The landscape is moderately infested with invasive plants such as Parthenium and Lantana.
Presence of invasive animals	Absent	Open grazing of cattle is a serious threat in the region.
Availability of seed bank, nursery, or underground root system	Partially present	A government nursery managed by the horticulture department is in operation in the vicinity of the project area. However, the community is not confident of the quality of the plants supplied by the nursery.
Availability of low-cost sources of native tree seeds and seedlings	Partially present	Native tree seeds and seedlings are available with the forest department nursery, the cost of which could not be ascertained.
Competing demands on forests	Absent	The rising demand for fuelwood is creating huge pressure on forests.
Presence of value chains	Absent	No formal value chain exists in the project area, except for tendu leaves, which are procured by government agencies.
Right of access to benefits from landscape restoration	Partially present	The community has the right of access to benefits from landscape restoration but it has not received the perceived tangible benefits.
Laws and policies on landscape restoration are aligned and streamlined	Absent	The community or officials are not aware of the laws and policies of landscape restoration; therefore, it cannot be conclusively determined whether those laws and policies are aligned and streamlined.

ENABLING FACTORS	STATUS	OBSERVATION BY THE SURVEY TEAM EXPERTS
Presence of laws and customary practices to restrict cutting or clearing of remaining natural forests	Partially present	Laws are present to prevent people from cutting trees. However, tribal communities misuse the policy that allows them to collect dead twigs and branches from forests.
Enforcement of laws and practices to restrict cutting or clearing remaining natural forests	Partially present	The survey team experts perceived that forest officials could not adequately enforce the laws that restrict tree-cutting because tribal communities' need for fuelwood is rising.
People living in and around the target landscape are empowered to take decisions on landscape restoration	Absent	Determining whether the people living in and around Sidhi are empowered to take decisions is difficult because no landscape restoration mechanism or program is being operated; however, the survey experts feel that the community can be empowered to take landscape restoration decisions through the Gram Panchayat, a democratic institution.
Access to restoration benefits	Partially present	An equitable distribution of the benefits of landscape restoration can be assumed to occur at a later stage of the project.
Roles, responsibilities, and rights are clearly defined	Partially present	In the pre-project implementation stage, it is difficult to determine whether roles, responsibilities, and rights are clearly defined for landscape restoration activities.
Recognition of authority among stakeholders	Present	A clearly laid out hierarchy of authority is present and recognized among major stakeholders such as the government and the Gram Panchayat. The community, on its part, recognizes the authority of government officials and the Gram Panchayat.
Stakeholders sufficiently coordinated to design, implement, and monitor restoration	Partially present	The administration's efforts to create synergy between the various departments of the government suggest that efforts are being coordinated to design, implement, and monitor restoration.

Source: WRI India authors.

Appendix B. Stakeholder analysis for the pilot cluster

The analysis identifies stakeholders' interest levels against the criteria that contribute toward the implementation and outcomes of the Sidhi restoration project (Table D1). For instance, the Gram Panchayat is interested in fulfilling restoration-related targets, development of the village, and communicating success. However, it is less interested in controlling activities or managing resources. Most of the

stakeholders showed great interest in implementing landscape restoration, the exceptions being local input dealers, influential businesspeople, and the youth of the area. Youth have low influence over project outcomes whereas local input dealers and influential businesspeople have significant influence.

TABLE B1 | Mapping stakeholders and their influence on project activities

STAKEHOLDER	INTEREST OF THE STAKEHOLDER	INTEREST TYPE + OR -	IMPORTANCE OF PROJECT SUCCESS FOR THE STAKEHOLDER 0 = LOWEST 5 = HIGHEST	INFLUENCE LEVEL OF THE STAKEHOLDER 0 = LOWEST 5 = HIGHEST
Gram Panchayat	Targets fulfilled	+	5	5
	Development of village	+		
	Publicity/popularity of village in the district and state	+		
	Control over activities and resources	-		
Line department officials (agriculture, horticulture, veterinary, etc.)	Targets fulfilled	+	5	4
	Cooperation from community	+		
	Control over activities and resources	-		
SRLM department	Targets fulfilled	+	5	4
	Cooperation from community/self-help group (SHG)	+		
	New enterprises developed	+		
SHG/JFMC/other group members	More activities and livelihood options	+	5	2
	Better coordination with administration and line departments	+		
	Climb up the social ladder	+		
Forest department	Pressure on forest reduced	+	3	3
	Conflicts with community reduced	+		
General farmers in the project area	Better production	+	5	1
	Better price realization of products	+		
	More livelihood opportunities	+		
Youth in the area	Entrepreneurship options	+	2	1
	More employment options	+		
Local businesspeople (present in the village)	Work in coordination with FPCs to enter value chains	+	2	5
	Procure from the increased marketable surplus available in the area	-		

STAKEHOLDER	INTEREST OF THE STAKEHOLDER	INTEREST TYPE + OR –	IMPORTANCE OF PROJECT SUCCESS FOR THE STAKEHOLDER 0 = LOWEST 5 = HIGHEST	INFLUENCE LEVEL OF THE STAKEHOLDER 0 = LOWEST 5 = HIGHEST
Local input dealers	Work in coordination with FPCs to enter value chains	+	1	4
	Tap into the increased farm input needs of farmers	-		
Influential business-people in Sidhi	Work in coordination with FPCs to enter value chain	+	2	5
	Procure from the increased marketable surplus available in the area	-		
Fuelwood collectors	Better alternative to fuelwood available	+	5	5
	Income generation options			
Farmers who leave their cattle for open grazing	Incentives for keeping cattle tied	+	5	5
	Veterinary services available			
	Income generation options			
Dominant class of the village	Prosperity in the village	-	4	5
	Work in coordination with FPCs to enter value chains	+		
ASA	Successful implementation of a world-class project	+	5	4
WRI India	Successful implementation of a world-class project with scope for replication	+	4	5
District administration/ state government	Successful implementation of a world-class project	+	5	5
	Citizens leading a better quality of life			
FPC	Better business opportunities and market linkages	+	5	1

Note: ASA = Action for Social Advancement. FPC = farmer producer company. JFMC = Joint Forest Management Committee. SRLM = State Rural Livelihoods Mission.
Source: WRI India authors.

Appendix C. Restoration interventions identified and proposed for the pilot project area

TABLE C | Proposed ecosystem restoration interventions in the Sidhi pilot cluster

LAND AND WATER RESOURCE MANAGEMENT		LAND TYPE/OWNERSHIP
Land	Soil and moisture conservation	
	Loose boulder, gully plugs, staggered trenches, field bunds, etc.	Forest land, revenue (encroached and un-encroached)
	Field bunding, land leveling	Private land
Water irrigation structures	Water resource development	
	Masonry stop dam	Forest and revenue land
	Renovation of masonry stop dam	Forest and revenue land
	Earthen dam	Forest and revenue land
	Renovation of earthen dam	Forest and revenue land
	<i>Doha</i> (sunken pond in <i>nullah</i>)	Forest and revenue land
	Farm ponds	Private land
	Soak pit tank	Private land
	Dug wells	Private land
	Renovation of dug well	Private land
	Micro lift irrigation system	Private land
	Drip irrigation system	Private land
DEVELOPMENT OF LAND, WATER, TREES, AND LIVESTOCK		LAND TYPE/OWNERSHIP
Tree-based interventions	Protection for regeneration of custard apple plants	Private land
	Agroforestry/agro-horti/wadi with vegetable intercropping	Private land
	Trees on boundaries (<i>bund</i> plantation)	Private land
COMMUNITY-LEVEL TREE-BASED INTERVENTIONS		LAND TYPE/OWNERSHIP
Tree-based interventions	Bamboo plantation for <i>nullah</i> bank stabilization	Revenue un-encroached
	Mixed-species plantation	Forest land
PROTECTION FOR NATURAL REGENERATION		LAND TYPE/OWNERSHIP
Tree-based interventions	Social protection of forest land for natural regeneration	Forest land
	Social protection of pasture land for natural regeneration	Revenue un-encroached

AGRICULTURE PRODUCTIVITY ENHANCEMENT FOLLOWING SUSTAINABILITY AND THE AGROBIODIVERSITY APPROACH		LAND TYPE/OWNERSHIP
Improving varieties and varietal diversity	Participatory testing of improved varieties and its dissemination	Private land
	Promotion of minor millets for improved production (<i>kodo</i> , <i>kutki</i> , barnyard millet on 25-decimal plot)	Private land
	Conservation of old variety crop: System of Rice Intensification (SRI)/Direct Seeded Rice (DSR)	Private land
	Improved Rabi cultivation with scientific POP: Bengal gram/lentil	Private land
	Participatory Varietal Selection and Promotion (PVSP) Kharif crop: paddy, pigeon pea, wheat, Bengal gram	Private land
Extension of Good Agriculture Practices (GAP)	Training, on-farm demonstration of GAP (seed selection, seed treatment, line sowing, inter-culture operation, Integrated Nutrient Management (INM), Integrated Pest Management (IPM), harvesting, storage)	Private land
Vegetable production	Poshan Vatika (nutrition gardens)—demonstrations—three demonstrations per village	Private land
	Promotion of leafy vegetables cultivation	Private land
	Promotion of spices cultivation	Private land
Organic farming	Promotion of homemade nutrient management: training	Private land
	Promotion of homemade pesticide management: training	Private land

Source: WRI India authors.

Appendix D. Enabling government schemes for restoration

TABLE D1 | Mapping policies and schemes with appropriate restoration interventions

NAME OF SCHEME/ PROGRAM/ INITIATIVE	NODAL MINISTRY RESPONSIBLE FOR IMPLEMENTATION (STATE GOVERNMENT)	KEY SCHEME OBJECTIVES ADDRESSED BY RESTORATION INITIATIVES
Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS)	Department of Panchayati Raj and Rural Development	- Enhance livelihood security of the rural poor by generating wage employment opportunities in works leading to the creation of durable assets through both NRM and non-NRM works. - Rejuvenate the natural resource base of rural areas - Create a durable and productive rural asset base - Empowerment of the socially disadvantaged—especially women, SCs, and STs—through the processes of rights-based legislation - Strengthen decentralized, participatory planning through convergence of various anti-poverty and livelihoods initiatives - We have leveraged the NRM works of MGNREGS to restore degraded areas through soil and water conservation measures.
Watershed Component Development-Pradhan Mantri Krishi Sinchayee Yojana (WDC-PMKSY 2.0)	Department of Panchayati Raj and Rural Development	- Improve the productive potential of rainfed/degraded land through integrated watershed management - Strengthen community-based local institutions to promote livelihoods and watershed sustainability - Rainfed agriculture assumes critical importance from the broader perspective of economy, ecology, and equity - Alignment has been ensured with this scheme's objectives through uptake of the watershed approach, such as ridge-to-valley activities in the Sidhi pilot cluster
National Bamboo Mission (NBM)	Ministry of Agriculture and Farmers Welfare	The NBM focuses on the development of the complete value chain of the bamboo sector and links growers with markets. The mission's emphasis is on the propagation of quality bamboo plantations of commercially required species, product development, and value addition. In Sidhi, the scheme has been incentivized for bamboo plantation in selected areas of the pilot cluster.
Madhya Pradesh State Rural Livelihoods Mission	Department of Panchayati Raj and Rural Development	The mission focuses on social and financial inclusion, particularly through the empowerment of women by building, sustaining, and growing institutions such as SHGs. Working with SHGs has been central to our pilot in not only mobilizing ground support but also facilitating some of our community-led interventions through SHGs.
National Bank for Agriculture and Rural Development (NABARD) Watershed Development Fund (WDF)	NABARD	This fund aims to provide employment to the SC and ST communities and women by creating NRM assets such as soil and moisture conservation and water resources. It focuses on fostering environmental sustainability while also promoting capacity-building and skill development. The WDF component of NABARD has been utilized for land treatment through water-based interventions.

Source: WRI India authors.

TABLE D2 | Sources of funding for restoration interventions

SOURCE OF FUNDING	SOIL AND MOISTURE CONSERVATION	WATER RESOURCE DEVELOPMENT	TREE-BASED INTERVENTIONS	TOTAL EXPENDITURE (INR)
MGNREGA	65 structures treating 72 hectares (ha) of land	128 structures treating 344 ha of land	146 ha of block plantation	70,227,015 (\$770,878)
CAMPA	X	X	172 ha of block plantation	X
PMKSY 2.0	8 structures treating 65.5 ha of land	30 structures treating 74.5 ha of land	3.75 ha bund plantation	27,151,000 (\$298,200)
NABARD (WDF)	38 structures treating 90 ha of land	9 structures treating 7 ha of land	2 ha of block plantation	1,431,112 (\$15,709)
CSR (ASA + WRI India)	143 structures treating 257 ha of land	109 structures treating 132 ha of land	130 ha of bund and block plantation	47,582, 722 (\$522,313)

Note: ASA = Action for Social Advancement. CSR = corporate social responsibility. MGNREGA = Mahatma Gandhi National Rural Employment Guarantee Act. CAMPA = Compensatory Afforestation Fund Management and Planning Authority. PMKSY = Pradhan Mantri Krishi Sinchayee Yojana. X = data not available. Structures refer to soil and water conservation measures which includes- gully plugs, farm ponds, dug wells among others

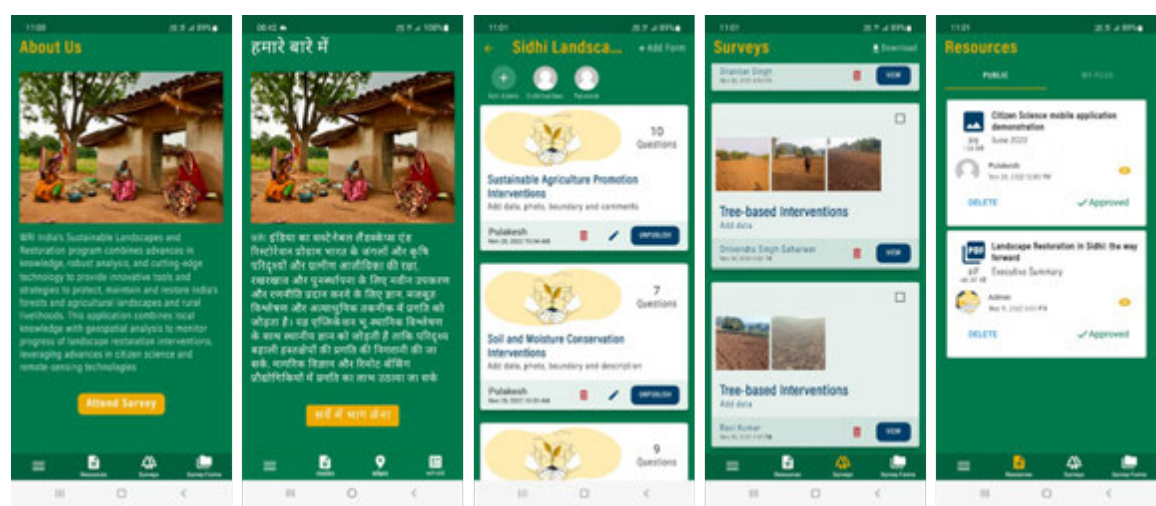
Source: WRI India authors.

Appendix E. Monitoring restoration interventions through the citizen science application

WRI India developed a citizen science monitoring application to track biophysical and socioeconomic indicators at the field level across restoration interventions in the Sidhi pilot cluster ([Android link](#) and [iOS link](#)). The tool allows community members and field functionaries to submit geotagged photos and GPS-enabled survey data tailored to specific activities such as plantations, soil and water conservation structures, and agriculture interventions. The real-time information generated through the app supports adaptive management,

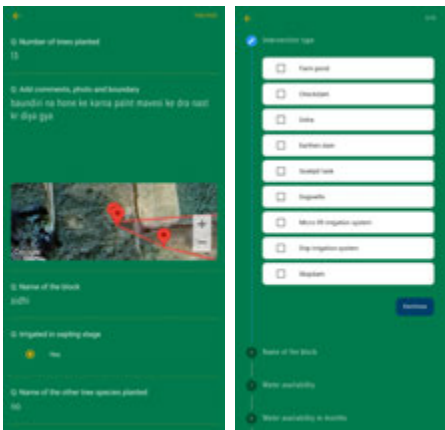
helping implementation teams detect emerging issues—such as low plantation survival or climate-related stresses—and adjust program strategies in collaboration with communities. By directly involving local stakeholders in monitoring, the app reinforces community ownership and stewardship of the restored landscapes. Following the successful piloting in Sidhi, the tool is planned for scale-up to other landscape restoration projects.

FIGURE E1 | Citizen science app survey forms tailored to the restoration interventions



Source: WRI India authors.

FIGURE E2 | Geotagging interventions at the pilot site in the citizen science app



Source: WRI India authors.

Appendix F. Landscape restoration project outcomes in pilot cluster

TABLE F1 | Details of project activities and outcomes

ACTIVITIES	INDICATORS	OUTCOMES
Community outreach	Community outreach and members benefited	39,197
Land area treated	Land brought under restoration under soil moisture and water conservation activities (in hectares)	1,041
	No. of structures constructed for water resource development and soil conservation	523
	Land brought under restoration through tree-based interventions (in hectares)	454
	Trees grown on private land and community land	299,355
	Land area brought under restoration through sustainable agriculture interventions	676
	No. of farmers associated with agriculture production enhancement and agrobiodiversity conservation interventions implemented	7,593
Social benefits and technical assistance	No. of persons with access to social benefits (no. of households that received work under MGNREGA)	13,849
	No. of women with access to social benefits	7,192
	No. of members of the SC or ST categories with access to social benefits	11,125
	No. of people trained in various aspects of landscape restoration planning and execution, monitoring, and awareness of policies and legislations (including small and marginal farmers, SHGs, members of PRIs, and district-level officials)	7,039
Value chain and market linkages	No. of SHGs/CBOs linked (to restoration/value chain activities)/revived/formed	144
	No. of tree species for which value chains and institutional and market linkages have been developed	1
	No. of SHGs/CBOs with credit linkages	106
FPO business	Revenue generated through value chain (sale of bamboo, improved variety of seeds: wheat, millets such as kodo)	INR 4.756 million (approx.) (~\$1,978.14)
Food and nutritional security	Agri-nutrition garden (Poshan Vatika) and spices cultivation	700+
	No. of famers who adopted organic agriculture for all crops and the entire land	600
Sustainable agriculture	Participatory testing of improved varieties and its dissemination for improving varietal diversity	Over 2,300 farmers reached
	PVSP/FLD/SRI demonstration of paddy for improved cultivation	8 new varieties of seeds were introduced in the area, and over 2,000 farmers directly benefited from seed replacement
	PVSP/FLD/demonstrations of the Dharwad cultivation method for pigeon pea to improve cultivation	
	Promotion of minor millets for improved production	
	PVSP/FLD/SWI demonstration of wheat for improved cultivation	
	PVSP/FLD of Bengal gram for improved cultivation	

ACTIVITIES	INDICATORS	OUTCOMES
Tree-based interventions	The following types of tree-based interventions were undertaken on both private and government land: Agroforestry/agro-horti/wadi with vegetable intercropping Trees on boundaries/bund plantation Bamboo plantation on forest land Block plantation: mixed species	454 hectares of land brought under restoration through various types of tree-based interventions
Soil and water conservation interventions	Various structures for water conservation and soil moisture retention were constructed, such as the following: Farm pond, dug wells, earthen dam, gully plugs, and contour trenches	A total area of 1,041 hectares was brought under restoration

Note: CBO = community-based organization. FLD = frontline demonstration. MGNREGA = Mahatma Gandhi National Rural Employment Guarantee Act. CAMPA = Compensatory Afforestation Fund Management and Planning Authority. PMKSY = Pradhan Mantri Krishi Sinchayee Yojana. PRI = Panchayati Raj Institution. PVSP = Participatory Varietal Selection and Promotion. SC = Scheduled Caste. SHG = self-help group. SRI = System of Rice Intensification. ST = Scheduled Tribe.

Source: WRI India authors.

Abbreviations

ACS	Additional Chief Secretary	MGNREGS	Mahatma Gandhi National Rural Employment Guarantee Scheme
ASA	Action for Social Advancement	MoAFW	Ministry of Agriculture & Farmers Welfare
CAMPA	Compensatory Afforestation Fund Management and Planning Authority	MoEFCC	Ministry of Environment, Forest and Climate Change
CBO	Community-Based Organization	MoU	Memorandum of Understanding
CEO	Chief Executive Officer	MPSEGC	Madhya Pradesh State Employment Guarantee Council
CSE	Centre for Science and Environment	NABARD	National Bank for Agriculture and Rural Development
CSO	Civil Society Organization	NbS	Nature-based Solutions
CSR	Corporate Social Responsibility	NBM	National Bamboo Mission
DAY-NRLM	Deendayal Antyodaya Yojana–National Rural Livelihoods Mission	NDC	Nationally Determined Contribution
DoAC&FW	Department of Agriculture, Cooperation & Farmers Welfare	NGO	Non-Governmental Organization
DSR	Direct Seeded Rice	NRM	Natural Resource Management
FAO	Food and Agriculture Organization	NTFP	Non-Timber Forest Product
FLD	Frontline Demonstration	P&RD	Panchayat and Rural Development Department
FPC	Farmer Producer Company	POP	Package of Practices
FPO	Farmer Producer Organization	PRI	Panchayati Raj Institution
GAP	Good Agriculture Practices	PVSP	Participatory Varietal Selection and Promotion
GIM	National Mission for a Green India (Green India Mission)	RKVY	Rashtriya Krishi Vikas Yojana
GIS	Geographical Information System	ROAM	Restoration Opportunities Assessment Methodology
GoI	Government of India	SC	Scheduled Caste
GoMP	Government of Madhya Pradesh	SDG	Sustainable Development Goal
GPDP	Gram Panchayat Development Plan	SHG	Self-Help Group
GPFLR	Global Partnership on Forest Landscape Restoration	SME	Small and Medium Enterprise
Ha	Hectare	SRI	System of Rice Intensification
HSBC	Hongkong and Shanghai Banking Corporation	SRLM	State Rural Livelihoods Mission
ICRISAT	International Crops Research Institute for the Semi-Arid Tropics	ST	Scheduled Tribe
INR	Indian Rupee	SWI	System of Wheat Intensification
IPCC	Intergovernmental Panel on Climate Change	TCI	Tata-Cornell Institute for Agriculture and Nutrition
IPM	Integrated Pest Management	TRI	Transform Rural India
ISRO	Indian Space Research Organisation	VB-G RAM G	Viksit Bharat–Guarantee for Rozgar and Aajeevika Mission (Gramin)
IUCN	International Union for Conservation of Nature	VPRP	Village Prosperity Resilience Plan
JFMC	Joint Forest Management Committee	WDC-PMKSY	Watershed Development Component – Pradhan Mantri Krishi Sinchayee Yojana
LDN	Land Degradation Neutrality	WDF	Watershed Development Fund
Mha	Million Hectares	WRI	World Resources Institute
MGNREGA	Mahatma Gandhi National Rural Employment Guarantee Act	WWF-India	Worldwide Fund for Nature India

Endnotes

1. We use a single rate (USD 1 = INR 91.50, as on January 21, 2026) to convert all financial figures. We use this exchange rate for illustrative purposes only—some figures date back to 2021, and as rates moved considerably between 2021 and 2025, the actual dollar value at the time of expenditure would have varied throughout the period.
2. Marginal farmers are those with landholdings below 1 hectare. Smallholder farmers hold 1–2 hectares, according to the Agricultural Census in India.
3. A collaborative implementation plan, developed by WRI India and ASA, guided the Sidhi pilot by outlining the intervention design steps, defining stakeholder roles, establishing governance modalities, and selecting the pilot cluster within Sidhi block.
4. Throughout the pilot, WRI India and ASA—combining quantitative metrics with qualitative narratives—prepared project progress reports for the donor. These reports documented updates on biophysical outcomes, socioeconomic impacts, and programmatic developments, thus providing a comprehensive view of the project's implementation and results.
5. In India's administrative hierarchy, a district is subdivided into tehsils (or talukas), which in turn comprise several blocks or development blocks. These serve as key administrative units for planning and implementing government programs at the sub-district level.
6. Sidhi district comprises seven tehsils (Bahri, Churhat, Gopad Banas, Kusmi, Majhauli, Rampur Naikin, and Sihawal) and five blocks (Kusmi, Majhauli, Rampur Naikin, Sihawal, and Sidhi).
7. A cluster of 13 villages in Sidhi block was identified for the pilot: Kochila, Dolkothar, Tilmani, Pawaiya Purv, Masuriha, Padkhuri, Bishunitola, Hadbado, Bhata, Dandi, Koluha, Kochita, and Bamuri.
8. India follows a federal governance structure in which policy direction is led by state-level departments whereas district administrations are responsible for on-the-ground implementation. Accordingly, the governance model for the Sidhi pilot includes a state-level Steering Committee housed within the P&RD, complemented by a district-level committee under the Sidhi administration to oversee implementation and coordination.
9. The Chief Executive Officer of the Zila Panchayat (district-level rural local governance institution) is typically an administrative officer responsible for implementing rural development schemes, coordinating with line departments, and overseeing Gram Panchayat planning and execution across the district.
10. PRIs are constitutionally mandated local self-governance bodies in rural India, structured at three levels—Gram Panchayat (village), Janpad or Block Panchayat (intermediate), and Zila Panchayat (district). They are responsible for decentralized planning, implementation of development schemes, and facilitating community participation in local governance.
11. Contour bunding refers to the construction of earthen or stone embankments along land contours to reduce soil erosion and improve rainwater retention. Implemented as permissible work under the MGNREGS, it supports both livelihood generation through wage employment and long-term land and water conservation in rainfed agricultural areas.
12. Natural resource management works under the MGNREGS—such as contour trenches, contour bunds, and check dams—are implemented to conserve soil and water, enhance groundwater recharge, and improve the productivity of degraded lands while simultaneously generating wage employment for rural households.
13. Ecosystem services refer to the benefits humans obtain directly or indirectly from ecosystems. According to Millennium Ecosystem Assessment, ecosystem services can be divided into provisioning services (food, water, wood, and raw materials); regulating services (pollination of crops, flood and disease control, water purification, prevention of soil erosion, and sequestering carbon dioxide); cultural services (recreational, spiritual, and educational services); and supporting services (nutrient cycling and primary production).
14. GPDP–VPRP integration for NRM refers to the process of aligning the GPDP—mandated by the Ministry of Panchayati Raj—with the VPRP developed under DAY-NRLM. Recent advisories from the GoI encourage panchayats to incorporate VPRP priorities related to land, water, and livelihood assets directly into the GPDP. This enables NRM works—such as soil and water conservation, land development, and common resource restoration—to be planned in a more participatory, demand-driven, and convergent manner at the village level.

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