

# **Financing Climate Resilience: NABARD's Role in Sustainable Rural Development in India**

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## **Abstract**

Since 2015–16, NABARD has undertaken several initiatives to promote inclusive growth and sustainable rural prosperity in India. A key focus has been enhancing the resilience of agriculture to climate change. As the National Implementing Entity (NIE) accredited by the Green Climate Fund (GCF) in July 2015, NABARD plays a vital role in mobilizing climate finance for climate-resilient development. Climate change poses a significant threat to agriculture and rural livelihoods, particularly in India where farming is heavily reliant on monsoon patterns and faces structural challenges such as low irrigation coverage, fragmented landholdings, and weak post-harvest infrastructure. This paper aims to explore the funding mechanisms NABARD utilizes—both national and international—to support climate adaptation and mitigation in rural areas. It also examines various projects and schemes implemented for rural resource management and assesses how these initiatives contribute to sustainable rural development, climate action, and environmental sustainability.

## **INTRODUCTION**

We all share a responsibility to create a sustainable future for coming generations. As articulated in the Brundtland Report (1987), sustainable development is defined as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs." Achieving this vision requires transformative changes in current practices and significant investments in physical infrastructure, environmental protection, organizational development, and human capital. Additionally, fostering a culture that balances the diverse needs of communities while ensuring planetary well-being is essential. Climate change poses a serious threat to the environment and to sustainable development in multiple dimensions. Rising global temperatures have led to the melting of polar ice caps, sea level rise, and the increased frequency of extreme weather events. Shifts in precipitation patterns have disrupted water sources such as streams, ponds, and groundwater systems. These environmental changes have endangered various species, destabilized ecosystems and leading to biodiversity loss. Some species face extinction, while others are forced to migrate or adapt to new environments. Climate change also threatens livelihoods by affecting the availability and productivity of natural resources such as food, soil, and timber. It leads to reduced crop yields, pest outbreaks, and soil degradation, ultimately compromising food security, nutrition, and affordability—particularly for vulnerable populations. The growing intensity of droughts, floods, storms, and heatwaves further exacerbates these issues, hindering progress toward achieving the Sustainable Development Goals (SDGs).

In response, the Paris Agreement (2015) set global adaptation goals to enhance resilience, reduce vulnerability, and align national adaptation efforts with sustainable development. The agreement

emphasizes country-led strategies that integrate climate adaptation into national development plans, giving each country the authority and responsibility to define its unique adaptation needs. India has embedded sustainable development in its national planning process, aiming to improve overall well-being and alleviate poverty in a long-lasting manner. However, the agriculture sector-critical for the Indian economy and rural livelihoods-has become highly vulnerable to climate change, particularly due to irregular rainfall patterns causing frequent droughts and floods. In response, the Indian government has launched several social development schemes, many of which focus on climate adaptation through rural infrastructure improvements.

India's commitment to combating climate change is reflected in its participation in global treaties such as the United Nations Framework Convention on Climate Change (UNFCCC) and the Kyoto Protocol. Domestically, the National Action Plan on Climate Change (NAPCC), launched in 2008, outlines eight national missions in key areas including solar energy, energy efficiency, sustainable habitat, water, the Himalayan ecosystem, green cover, sustainable agriculture, and climate knowledge dissemination. State governments have aligned their State Action Plans on Climate Change (SAPCCs) with NAPCC's framework, focusing on sector-specific strategies such as agriculture, water, health, infrastructure, and biodiversity. Financial support for state-level adaptation measures is also being provided. The National Bank for Agriculture and Rural Development (NABARD) has played a pivotal role in advancing climate-resilient agriculture and inclusive rural development. Despite facing structural challenges like inadequate irrigation, fragmented land holdings, and low mechanization, Indian agriculture remains heavily dependent on the monsoon, making it particularly susceptible to climate variability. NABARD has partnered with central and state governments to implement climate adaptation and mitigation programs. Its initiatives in water conservation, natural resource management, and climate-resilient livelihoods have significantly contributed to rural resilience.

Since July 2012, NABARD has served as India's sole National Implementing Entity (NIE) for the Adaptation Fund (AF) and manages the National Adaptation Fund for Climate Change (NAFCC) and the Green Climate Fund (GCF). As an NIE, NABARD is responsible for the management, financial oversight, and reporting of adaptation projects supported by these funds. This study seeks to examine NABARD's strategic role in mobilizing national and international climate finance and implementing projects that promote sustainable agriculture, environmental sustainability, and climate resilience across India.

## **OBJECTIVE OF STUDY.**

- To examine NABARD's strategic role as India's National Implementing Entity (NIE) for major international and national climate finance mechanisms, with a focus on its approach to climate adaptation in the rural sector.
- To analyse the sector-wise allocation, disbursement, and utilization of financial resources under the Adaptation Fund (AF), Green Climate Fund (GCF), and National Adaptation Fund for Climate Change (NAFCC) across NABARD-supported projects.

### **3. NABARD's Role as National Implementing Entity (NIE) and Strategic Approach (*Objective 1*)**

This section addresses Objective 1 by examining NABARD's institutional role as a National Implementing Entity (NIE) and its multi-pronged strategy for climate adaptation in India.

The Reserve Bank of India established the Committee to Study Institutional Credit for Agriculture and Rural Development (CRAFICARD) at the request of the Indian government in 1979. The committee

recommended the creation of an institutional mechanism to address the credit needs of rural development, leading to the establishment of the National Bank for Agriculture and Rural Development (NABARD) as a statutory body in 1982 under the NABARD Act, 1981.

In July 2012, NABARD became the National Implementing Entity (NIE) for crucial funding mechanisms: the Adaptation Fund (AF) under the United Nations Framework Convention on Climate Change (UNFCCC), the National Adaptation Fund for Climate Change (NAFCC) in August 2015 under the Ministry of Environment, Forest and Climate Change (MoEFCC), and the globally administered Green Climate Fund (GCF) in July 2015. These accreditations enabled NABARD to directly secure international climate investments.

### Strategic Approach

NABARD's strategic approach to climate adaptation is portrayed through a process-driven, multi-dimensional framework that integrates national climate priorities with global adaptation mandates. This approach is expressed through the following pillars:

1. **Climate Vulnerability-Informed Planning:** NABARD integrates an understanding of climate risks and vulnerabilities into decision-making and policy development. It employs evidence-based climate vulnerability mapping to target resource allocation in ecologically fragile and socio-economically vulnerable regions. This facilitates strategic allocation of adaptation finance toward high-risk zones, such as drought-prone, coastal, and mountainous regions.
2. **Collaborative and Inclusive Governance:** NABARD's project implementation is conducted in collaboration with community-based institutions, local bodies, civil society organizations, and state line departments. This hands-on model ensures contextual relevance, grassroots ownership, and community engagement.
3. **Enhancing Capacity Through Institutional Frameworks:** NABARD's Centre for Climate Change, located at the Bankers Institute of Rural Development (BIRD) in Lucknow, acts as a knowledge and training hub. It offers capacity-building programs to support stakeholders in designing climate-related projects, conducting research, and promoting inter-institutional collaboration.
4. **Integration of Scientific Tools and Indigenous Knowledge:** Recognizing the value of hybrid knowledge systems, NABARD facilitates the integration of traditional ecological knowledge with modern scientific methods such as geospatial planning and climate modelling. This enhances the effectiveness and sustainability of adaptation interventions.
5. **Integrating Adaptation into Development Finance:** NABARD's operational philosophy integrates climate adaptation within its broader rural development mandate, fostering alignment between sectoral programs (e.g., watershed development, natural resource management, and rural credit) and climate resilience strategies. This enhances adaptive capacity, promotes sustainable resource management, and ensures the resilience of rural economies.

This multi-dimensional strategy positions NABARD not only as a financial intermediary but also as a key institutional player in India's climate governance landscape.

### 4. Overview of Climate Finance Mechanisms Implemented by NABARD (*Objective 2*)

As part of India's climate governance framework, NABARD serves as an accredited entity for multiple climate finance mechanisms that channel both international and domestic resources toward climate adaptation. These include the UNFCCC-backed Adaptation Fund (AF), the domestically managed

National Adaptation Fund for Climate Change (NAFCC), and Green Climate Fund (GCF). Each fund has a distinct scope, operational structure, and thematic focus.

This section highlights NABARD's involvement, sectoral engagement, and project-level implementation under each of these three mechanisms, thereby fulfilling Objective 2 of this study.

#### 4.1. Adaptation Fund (AF)

The Adaptation Fund (AF) is a fund established under the Kyoto Protocol of UNFCCC, which has unique characteristics and has increased the amount of funding available for climate adaptation projects in developing countries that are vulnerable to the adverse effects of climate change. This is a new approach to managing funds under the United Nations Climate Convention. The fund receives money from a two percent share of the revenue generated by Clean Development Mechanism (CDM) projects, as well as voluntary donations from donor governments. NABARD serves as the National Implementing Entity (NIE) for evaluating resources under adaptation funds for India. It is responsible for the overall project appraisal, execution, supervision, and fund allocation of projects funded by the AF in India. NABARD aims to utilize AF resources to enhance the adaptation capacity and resilience of vulnerable communities and ecosystems in India. To date, eight projects have been approved under this mechanism, including six AF projects in areas prone to climate risks and having fragile ecosystems.

The funds allocated through the Adaptation Fund through various projects under different sectors are shown in Figure 1 and Table 1.

##### 4.1.a. Sector-wise allocation of approved projects under Adaptation Fund until 2022.

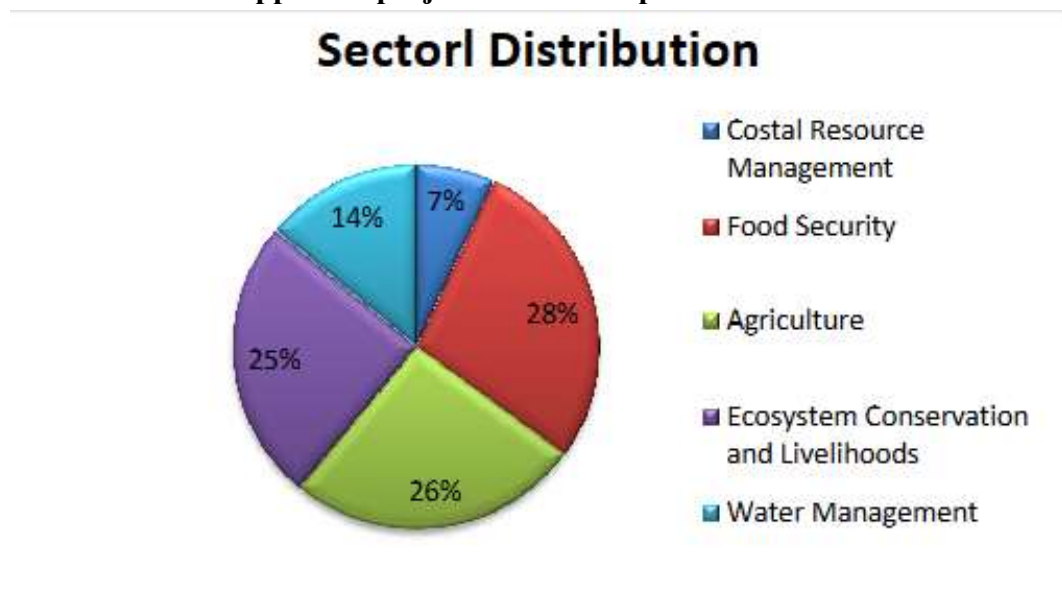


FIGURE 1.

SOURCE: NABARD ANNUAL REPORT

##### 4.1.b. The Project titles, Locations, Status and Funding amounts of the Adaptation Fund (AF) projects until 2022.

Project Name	LOCATION	Purpose/Focus Area	AMOUNT (₹ Million)	Status
Conservation of Coastal Resources	Andhra Pradesh (Krishna delta)	Mangrove restoration and sea-level rise adaptation	41.4	Completed

Adaptive Capacity in Small Inland Fisheries	Madhya Pradesh	Inland fisheries and livelihood security	107.4	Ongoing
Adaptive Capacity in Kanha-Pench Corridor	Madhya Pradesh	Livelihood and ecological resilience	166.1	Ongoing
Climate Smart Agriculture for Hill Communities	Uttarakhand (Champawat)	Climate-smart agriculture and water conservation	58.2	Completed
Enhancing Resilience of Small and Marginal Farmers	West Bengal (Purulia, Bankura)	Agriculture and water resilience	150.6	Completed
Climate Proofing of Watersheds	Rajasthan & Tamil Nadu	Watershed development	80.6	Completed
Sustainable Livelihoods in Flood-Prone Areas	Odisha	Diversified livelihoods and flood adaptation	100.2	Ongoing
Integrated Farming in Drought-Affected Regions	Maharashtra	Sustainable agriculture and drought resilience	128.3	Ongoing

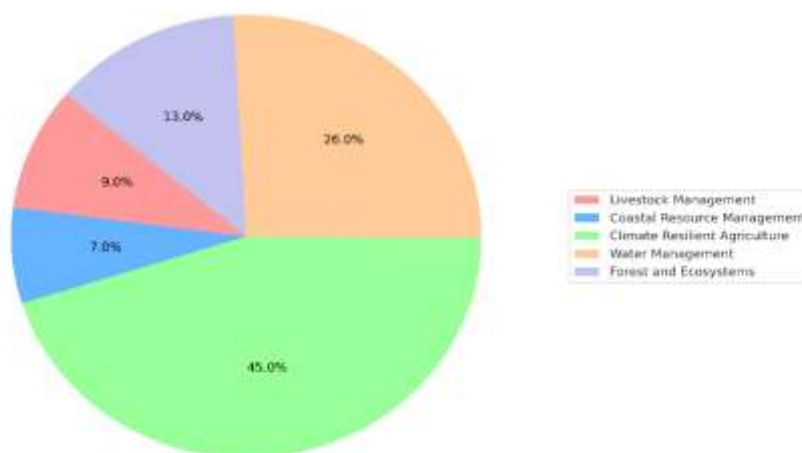
## 4.2. National Adaptation Fund for Climate Change (NAFCC)

The National Adaptation Fund for Climate Change (NAFCC) is a domestic initiative launched by the Government of India in **2015**, managed by the Ministry of Environment, Forest and Climate Change (MoEFCC), to meet the India's states and union territories identified as highly vulnerable to climate change are encountering substantial adaptation costs, posing serious implications for sustainable development and climate justice. In response, adaptive capacities are being progressively strengthened through targeted interventions aimed at building community resilience. These efforts are being guided by the overarching framework of the **National Action Plan on Climate Change (NAPCC)** and further operationalized through the **State Action Plans on Climate Change (SAPCCs)**. Together, these policy instruments serve as critical mechanisms for mainstreaming climate adaptation strategies across sectors, facilitating region-specific responses, and fostering inclusive development amidst escalating climate risks.

The **NABARD**, designated as the **National Implementing Entity (NIE)** for the NAFCC, holds the primary responsibility for overseeing the implementation of climate adaptation projects across India. This mandate is executed through NABARD's network of Regional Offices situated in various states and union territories. The actual execution of these projects is carried out by respective State Government departments and affiliated institutions, which serve as the Executing Entities. To date, the Ministry of Environment, Forest and Climate Change (**MoEF&CC**) has sanctioned 30 adaptation projects across 25 states **and** 2 union territories, reflecting a growing commitment to localized climate resilience and adaptive governance.



## 4.2.a. Sector-wise allocation of approved projects under National Adaptation Fund for Climate Change (NAFCC) until 2022.



**FIGURE 2**  
Source: NABARD annual report.

## 4.2.b. The Project titles, Locations, Status and Funding amounts of the NAFCC projects until 2022.

Project Name	Location	Purpose/Focus Area	Amount (₹ Million)	Status
Integrated Farming System in Wetlands	Kerala (Pokkali-Kaipad)	Wetland adaptation and aquaculture resilience	250	Completed
Water Security & Spring Rejuvenation	Sikkim (74 Gram Panchayats)	Water harvesting and spring recharge	246.7	Completed
Climate Resilient Agriculture	Jammu & Kashmir	Farming adaptation	225.2	Ongoing
Smart Agriculture for Livelihoods	Himachal Pradesh	Climate-smart farming	200	Ongoing
Ecosystem Services for Adaptation	Uttar Pradesh	Biodiversity-based ecosystem resilience	198	Ongoing
Surface Water Management	Puducherry & Karaikal	Tank and pond rejuvenation	167.6	Completed
Resilient Livestock Management	Punjab	Livestock resilience and fodder security	174	Ongoing
Crop Residue Management	Punjab, Haryana, UP, Rajasthan	Residue burning mitigation	1206.6	Ongoing
Carbon Positive Eco Village	Manipur	Community-based carbon neutrality	100	Ongoing
Climate Resilient Agroforestry	Rajasthan	Agroforestry integration in drylands	180	Completed

Heat-Resistant Crop Development	Tamil Nadu	Crop genetic adaptation	160	Ongoing
Women-Centric Climate Adaptation	Odisha	Livelihoods and gender-inclusive adaptation	140	Ongoing
Resilient Horticulture Practices	Assam	Climate-smart horticulture	210	Completed
Drought-Proofing Rural Ecosystems	Karnataka	Watershed-based drought resilience	215	Ongoing
Sustainable Fishing and Coastal Livelihoods	Goa	Coastal ecosystem and fisherfolk resilience	175	Completed
Adaptation through Renewable Energy Interventions	Gujarat	Solar pumps and renewable irrigation	160	Completed
Climate-Resilient Water Harvesting	Meghalaya	Small-scale water infrastructure	190	Completed
Village Tank Rejuvenation Project	Maharashtra	Traditional tank restoration	130	Completed
Agro-Climatic Planning for Mountain Communities	Nagaland	Hill agriculture and resilience	125	Ongoing
Silvopastoral Land Management	Haryana	Agro-pastoral landscape resilience	155	Ongoing
Ecological Farming in Tribal Areas	Chhattisgarh	Organic farming and tribal capacity building	170	Ongoing
Urban Water Resilience	Delhi	Urban wetland restoration	150	Ongoing
Reforestation and Livelihood Diversification	Madhya Pradesh	Afforestation and alternate income sources	165	Ongoing
Climate-Smart Dairy Farming	Bihar	Livestock sector adaptation	145	Ongoing
Flood Risk Reduction Infrastructure	West Bengal	Community infrastructure in flood zones	190	Completed
Renewable Micro-Irrigation Infrastructure	Telangana	Solar micro-irrigation systems	178	Ongoing
Sustainable Water Management in Desert Regions	Rajasthan	Water budgeting and rainwater harvesting	160	Completed
Integrated Climate-Agro Livelihoods	Tripura	Mixed cropping and financial inclusion	130	Completed
Reviving Traditional Paddy Cultivation	Arunachal Pradesh	Paddy system climate adaptation	145	Ongoing

Mangrove Conservation for Coastal Protection	West Bengal	Mangrove-based climate buffering	195	Completed
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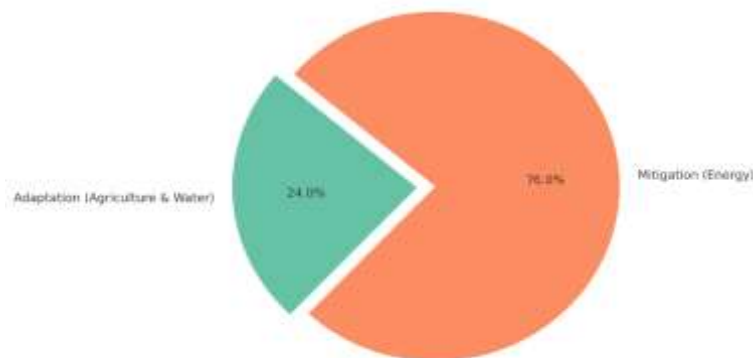
**Table: 2**

### 4.3. Green Climate Fund (GCF)

The Green Climate Fund (GCF) plays a major role in global climate finance, helping developing countries address climate change impacts. In India, the National Bank for Agriculture and Rural Development (NABARD) acts as the key implementing agency for GCF-supported programs. It uses its strong local presence to turn international funding into projects that support climate resilience in rural areas. These include initiatives like promoting renewable energy, improving smallholder farming systems, and restoring degraded ecosystems. NABARD's experience in rural finance allows it to manage GCF resources while keeping projects grounded in local realities. By supporting both adaptation and mitigation, NABARD's GCF work supports India's commitments under the Paris Agreement, especially in aligning climate action with rural development and poverty reduction. While some challenges remain — such as ensuring wider access and speeding up fund delivery — NABARD's role shows how national agencies can connect global climate goals with on-the-ground solutions.

As of 2022, NABARD has implemented two projects under the Green Climate Fund (GCF). The sector-wise distribution, along with project details including name, location, sanctioned amount, and purpose, are presented in the following Figure 3 and Table 3.

#### 4.3.a. Sector-wise allocation of approved projects under Green Climate Change (GCF) until 2022.



**Figure: 3 (author created)**

#### 4.3.b. The Project titles, Locations, Status and Funding amounts of GCF until 2022.

Project Name	Location	Purpose	Amount (₹ Million)	Status
Ground Water Recharge and Solar Micro-Irrigation to Ensure Food Security and Enhance Resilience in Vulnerable Tribal Areas	Odisha	Promote groundwater recharge, food security, and solar-powered irrigation in tribal areas	2270	Ongoing



Line of Credit for Rooftop Solar Installations in Commercial, Industrial, and Residential Sectors	Pan-India	Finance rooftop solar systems to reduce GHG emissions and support clean energy access	7170	Ongoing
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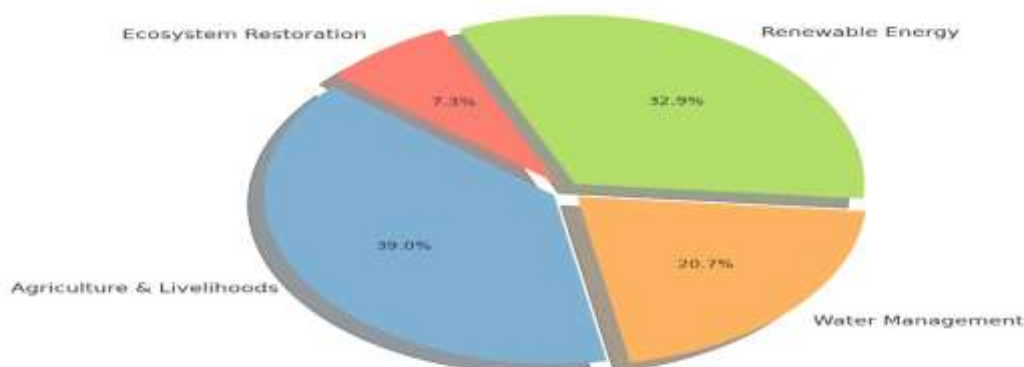
**Table: 3**

#### 4.4: Fund-Wise Allocation of NABARD Climate Projects (Till 2022)

Fund Name	Total Projects	Total Amount (₹ Million)
Adaptation Fund (AF)	8	609.4
National Adaptation Fund (NAFCC)	30	8,475.0
Green Climate Fund (GCF)	2	9,440.0

**Table: 4**

#### 4.5. Sector-Wise Allocation Across of all NABARD Climate Funds (Till 2022)



**Figure: 4 (author created)**

In summary, NABARD's work with the Adaptation Fund, NAFCC, and GCF shows a clear effort to match funding with regional climate needs. The data reflects how projects are selected and distributed based on sectoral priorities like agriculture, water, renewable energy and ecosystem restoration. With a good balance between adaptation and mitigation, the projects align with India's climate goals. Overall, NABARD's management of these funds demonstrates transparency, inclusiveness, and a strong link between finance and development outcomes.

## CONCLUSION

This study shows how NABARD, as India's main agency for handling climate funds, helps connect global and national money—like the Green Climate Fund or Adaptation Fund—to local projects. By doing this, NABARD has pushed climate adaptation into rural development plans, supporting things like farming that can handle climate shocks and jobs that don't rely on fragile ecosystems.

Looking at how funds are divided and spent, it's clear NABARD focuses on areas hit hardest by climate change: water systems, farming, restoring ecosystems, and creating new income sources. But here's the thing—actually making these projects work long-term isn't just about money. It needs careful tracking to see if they're really helping people and nature.

Going forward, NABARD could do better by improving how different groups work together, training local communities, and using traditional knowledge. For example, farmers might know which crops survive droughts, but that knowledge isn't always part of official plans. As India deals with more climate disasters—heatwaves, floods, dying crops—NABARD's job isn't just about moving money. It's about turning policies into real, on-ground action that keeps people and landscapes resilient.

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