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FOOD SYSTEMS
TRANSFORMATION THROUGH
AGROECOLOGY

Environment, Climate Change & Biodiversity

A Portfolio Analysis

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Contents

List of Abbreviations

AE	Agroecology
COVID-19	Corona Virus Disease of 2019
DPP Spices	DPP Spices Project on Establishing Sustainable Spice Supply Chain in four states of India
ERADA	Enhancing Rural Resilience through Appropriate Development Actions
FAO	Food and Agriculture Organization
FES	Sustainable Management of Forest Ecosystem Services
FS/AE framework	Food Systems Transformation through Agroecology framework
FST	Sustainable Food Systems Transformation
GIC	Green Innovation Centre
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH
HLPE	High Level Panel of Experts on Food Security and Nutrition of the Committee on World Food Security, Rome
MoA&FW	Ministry of Agriculture and Farmers' Welfare
MoEFCC	Ministry of Environment, Forest and Climate Change
MoFAHD	Ministry of Fisheries, Animal Husbandry and Dairying
MoRD	Ministry of Rural Development
MWCD	Ministry of Women and Child Development
NABARD	National Bank for Agriculture and Rural Development
NERAQ	Protection and Sustainable Management of Aquatic Resources in the North Eastern Himalayan Region of India
OHA	One Health and Agroecology
ProSoil	Soil Protection and Rehabilitation of Degraded Soil for Food Security
SAFAL	Sustainable Aquaculture for Food and Livelihood
SDG	Sustainable Development Goal
SENU	Securing Nutrition, Enhancing Resilience
SuATI	Support to Agroecological Transformation Processes in India
UNFSS	United Nations Food Systems Summit
VSS	Voluntary Sustainability Standards
WFP	World Food Programme

Executive summary

Besides enormously contributing to the overshoot of planetary boundaries, global agri-food systems are struggling to meet the challenge of providing nutritious food for 800 million undernourished people. Millions of children are affected by acute and/or chronic malnutrition, more than 2 billion people are overweight, and more than 2 billion people suffer from micronutrient deficiency. Various shocks (e.g., extreme weather events, violent conflicts, pandemics) and stresses (e.g., climate change) and its consequences further aggravate the situation and are major causes for the lack of progress on meeting the Sustainable Development Goal (SDG) 2 'End hunger, achieve food security and improved nutrition and promote sustainable agriculture'. Therefore, food systems need a transformative change in order to be able to feed and nourish the growing and increasingly urbanised world population within planetary boundaries and become nutritionally, economically, ecologically and socially viable and thus sustainable for today's and future generations.

Globally, food systems are struggling to meet the challenge of providing nutritious food

Building on the work of the United Nations Food Systems Summit (UNFSS) to promote proactive and strategic dialogue about national policies and experiences, the Environment, Climate Change & Biodiversity Cluster of GIZ India developed a comprehensive and integrated Food Systems Transformation through Agroecology (FS/AE) framework, which is an amalgam of agroecology and sustainable food systems. To operationalise this framework, a Cluster Portfolio Analysis was conducted, with the aim of encouraging projects to collaborate with and complement each other for establishing FS/AE pathways and creating synergistic impact for transforming food systems in India. Ten (10) project teams of the cluster, engaged in an appreciative inquiry of their projects vis-à-vis the pathways, principles and activities detailed in the FS/AE framework, to ascertain the 'What is' aspect of the project status and to identify potentials for synergy between cluster projects.

The Cluster Portfolio Analysis was conducted in two stages. In stage 1 (pathway shortlisting), each project identified and ranked 5 (five) out of 10 (ten) pathways which were most significantly represented in their respective projects. Subsequently, in stage 2 (FS/AE– Food Systems/Agroecology – dimension selection), the projects dived deeper to map their projects to dimensions and Sub-dimensions of the pathways shortlisted in stage 1.

Overall, the ten (10) participating projects of the cluster were operating in sixteen (16) states of India and engaging with six (6) political partners (government departments). The cluster reported a strong focus on building stronger production systems along AE principles, agroecosystems' synergy, policy and governance, inclusive growth and food supply chains. Pathways which may be further explored included economic gains and economic diversification, nutrition and health, connecting consumers and agroecology adoption support systems.

Concerning the establishment of synergy at the project level, two projects, Securing Nutrition, Enhanced Resilience (SENU) and Soil Protection and Rehabilitation of Degraded Soil for Food Security (ProSoil), have emerged as evolved initiatives with well-defined pathways. Consequently, they present noteworthy prospects for inter-project collaborations aimed at generating synergistic effects and expediting progress toward the transformation of India's food systems. At the state level, Madhya Pradesh, where five (5) projects were operational, may be taken up as a model state to detail out potential areas for building synergies among projects and states. At the programmatic level, projects may forge collaborations for increased uptake of activities to further strengthen and sustain pathways for production systems, food supply chains, economic gain and diversification, diets and nutrition and consumer connect. It is suggested that a consultative mechanism may be established to facilitate collaborations and redesign (if necessary) of projects for ensuring that food systems transformation is addressed through an agroecological centric engagement at all levels.

800 million
undernourished people

Millions of children are affected by acute and/or chronic malnutrition

1 The Genesis

For more than 60 years, the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH has been working jointly with partners in India for sustainable economic, ecological and social development through four project clusters which are:

- Energy
- Sustainable Economic Development,
- Sustainable Urban and Industrial Development, and
- Environment, Climate Change and Biodiversity

The Environment, Climate Change & Biodiversity Cluster of GIZ India (referred to henceforth as 'the Cluster') consists of 39 projects. Climate change mitigation and adaptation, the protection of the environment and natural resources as well as biodiversity, are particular important areas in the Cluster, with the overarching aim of contributing to the Sustainable Development Goals (SDGs). Main commissioning parties of GIZ in India are the German Federal Ministry for Economic Cooperation and Development (BMZ), the Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection (BMUV) as well as the Federal Ministry for Economic Affairs and Climate Action (BMWK). Other clients include Indian public sector clients, the European Union and international funds such as the Nationally Appropriate Mitigation Action Facility (NAMA Facility) as well as foundations like the Bill & Melinda Gates Foundation.

The first-of its-kind United Nations Food Systems Summit (UNFSS) in September 2021 emphasised the need for more systematic approaches to achieve food systems transformation. In May 2022, the German Federal Ministry for Economic Cooperation and Development (BMZ), and the Indian Ministry of Agriculture and Farmers Welfare (MoA&FW) signed a Joint Declaration of Intent to intensify their cooperation under an Indo-German Lighthouse **'Agroecology and Sustainable Management of Natural Resources'** with the objective to support the transition towards sustainable agriculture and food systems. Through this partnership, both countries demonstrate a firm political commitment to jointly work for a world free of hunger and poverty within planetary boundaries.

Building on the work of United Nations Food Systems Summit (UNFSS) in 2021 as well as the objective of the bilateral Lighthouse Initiative, the Cluster formed a working group with an intent to strengthen the agenda for Sustainable Food Systems Transformation (FST) based on agroecological principles. Through engagement of international and national consultants, consultations with project teams, experts and international agencies, the international expert developed the theory of change narrative and an integrated Food Systems/Agroecological (FS/AE) framework detailing pathways for achieving Sustainable Food Systems Transformation through Agroecology.[1]

Subsequently, 'the Cluster' engaged the services of Ecociate, an Indian consultancy firm, to conduct a cluster portfolio analysis for,

a. Mapping the status of the projects comprising 'the Cluster' vis-à-vis the FS/AE framework, and

b. Identifying potential synergies for building the FS/AE narrative for the cluster.

Based on the FS/AE framework, Ecociate developed a methodology, designed as a self-appreciative inquiry exercise, for gathering information from participating projects. Ten (10) projects of 'the Cluster' volunteered to participate in this initiative. Based on the information shared by the projects, Ecociate conducted an analysis and consolidated their findings in this report which may be used for sharing FS/AE perspectives, within the cluster and among other relevant stakeholders, for framing the collective imagination among stakeholders to embark on a journey of discovering inter-project and inter-cluster synergies, rethinking and re-envisioning new cluster goals, co-creating the granularities of 'the Cluster' narrative and driving innovations for delivering FS/AE goals.

1 Development of an integrated analytical framework based on the food systems and agroecological approaches: Theory of change narrative and analytical framework. (GIZ India, Environment, Climate Change & Biodiversity Cluster).

2

Integrated Framework: Food Systems Transformation through Agroecology (FS/AE)

The Abstract

Given the challenges involved in achieving Sustainable Development Goal 2 (SDG 2: End hunger, achieve food security, improve nutrition and promote sustainable agriculture), the FS/AE Framework has been developed as a comprehensive analytical framework that integrates Food Systems (FS) and Agroecology (AE) approaches. It focuses on "what is" appropriate for the mandate of Food Systems Transformation to evolve wherein Agroecological Principles form the foundational processes. It thus, holistically encompasses sustainable production systems, supply chains, economic diversification, diet & nutrition, markets and enabling policy. It lays down a roadmap including ten (10) pathways with 46 underlying principles of Agroecology (AE) and su-bdimensions of Food Systems, and 72 activities for achieving Sustainable Food Systems Transformation through Agroecology. Thus, as one drills down into a pathway one uncovers principles, dimensions, sub-dimensions and activities overlaid on each other, in that order, with activities as the fundamental layer. The pathways have been formulated as hypotheses and are woven together with avenues for overlaps, complementarities and synergistic collaborations.

2.1 Building the FS/AE Analytical Framework[2]

The context: World food and nutrition insecurity and dysfunctional agri-food systems

Global agri-food systems that "produce" more than 800 million undernourished people, millions of children affected by acute and/or chronic malnutrition, more than 2 billion people who are overweight, and more than 2 billion people who suffer from micronutrient deficiency while at the same time enormously contributing to the overshoot of planetary boundaries are not fit for the future.

Despite improvements in overall affordability of diets[1] current agri-food systems in several regions fall short on issues of access to sufficient, safe and nutritious foods for all and reducing the levels of malnutrition. In addition, the current production, processing, commercialisation, preparation, handling and consumption patterns of food contribute to ecological degradation of soil, land and water resources, and loss of biodiversity along with poor living conditions and declining health of both producers and consumers in rural and urban areas all over the world. The year 2023 marks the mid-point of implementation of the 2030 Agenda, but progress on achieving the Sustainable Development Goal (SDG) 2 'End hunger, achieve food security and improved nutrition and promote sustainable agriculture' is lacking behind[2]. Various shocks (e.g., extreme weather events, violent conflicts, pandemics such as COVID-19) and stresses (e.g., climate change) and its consequences further aggravate the situation and are amongst the major causes for the lack of progress. Compared to 2019, 161 million more people were suffering from hunger in 2020. According to the World Food Programme (WFP), more than 345.2 million people are projected to experience food insecurity in 2023, which is more than double the number in 2020[3]. Given the magnitude of the task and the challenges involved in achieving the SDG 2, food systems need a **transformative change** in order to be able to feed and nourish the growing and increasingly urbanised world population within the planetary boundaries and become nutritionally, economically, ecologically and socially viable and thus sustainable for todays and future generations.

Emerging solutions

The agroecological transformation of food systems is promoted by influential stakeholders as an essential approach to improved food and nutrition security. A **food systems** comprises of 'all the elements (environment, people, inputs, processes, infrastructures, institutions, etc.) and activities that relate to the production, processing, distribution, preparation, handling and consumption of food, and the output of these activities, including socio-economic and environmental outcome". A food system is considered sustainable when it 'ensures food and nutrition security for all in such a way that the economic, social and environmental bases to generate food and nutrition security of future generations are not compromised'[3]. The core dimensions of food systems are (i) food supply chains, (ii) consumer behaviour, and (iii) diets, overlapping with (iv) food environments, which refer to the physical, economic, socio-cultural and policy conditions that shape availability, accessibility, affordability and desirability[4] as the

2 Elaborated by an international expert Dr. Lioba Weingärtner, Consultant, in collaboration and co-creation with
- Susanne Milcher, Nadine Bader, Neha Khara, GIZ Securing Nutrition, Enhancing Resilience (SENU) India
- Liesa Nieskens, GIZ Support to Agroecological Transformation Processes in India (SuATI)
- Stephanie Katsir, GIZ Soil Protection and Rehabilitation of Degraded Soil for Food Security (ProSoil) India
- Sharat Singh, Meekha Paul, GIZ Enhancing Rural Resilience through Appropriate Development Actions (ERADA) India
- Jeherul Islam, Sustainable Aquaculture for Food and Livelihood (SAFAL) India
- Kirti Mishra, national consultant taking exchanges with representatives of other GIZ Cluster projects, GIZ Headquarters staff and an Expert Consultation into consideration; Date: 04/10/2022.

3 HLPE. 2020. Food security and nutrition: building a global narrative towards 2030. A report by the High Level Panel of Experts on Food Security and Nutrition of the Committee on World Food Security, Rome (www.fao.org/3/ca9731en/ca9731en.pdf) and HLPE. 2017. Nutrition and food systems. A report by the High Level Panel of Experts on Food Security and Nutrition of the Committee on World Food Security, Rome., p. 23 (www.fao.org/fileadmin/user_upload/hlpe/hlpe_documents/HLPE_Reports/HLPE-Report-12_EN.pdf)

4 Food Systems and Diets: A Handbook of Essential Policies - Global Panel (glopan.org)

key interventions of the food systems. These core dimensions of a food system are supported by several other systems (ecosystems, human, energy, economic, and health systems) and influenced by complex drivers, such as biophysical and environmental factors, technology, innovation and infrastructure, economic and market, political and institutional, socio-cultural, and demographic factors. The food system also interacts with policy and governance systems in order to shape food system for improved nutrition and (diet related) health outcomes as well as broader economic, social and environmental impacts (see Annex 1).

161 million

more people were suffering from hunger in 2020

Today, **agroecology** is considered by influential stakeholders in world food and nutrition security a relevant transformative pathway with high potential for achieving the necessary change of food systems[5]. There are multiple understandings of agroecology as (i) a scientific discipline, (ii) a set of farming practices, and (iii) a social movement. The concept of agroecology, which was initially limited to the farm or field level and then evolved to the agroecosystem level, is nowadays extended to the entire food systems. While there is neither a single consensual definition for agroecology nor an agreement on all the aspects embedded in this concept, a consolidated set of 13 principles – taking FAO's 10 elements of agroecology into consideration – was elaborated by the High-level Panel of Experts (HLPE) on Food Security and Nutrition of the United Nations Committee on World Food Security (CFS) in 2019 (see Annex 2). Some of these principles are related to the agroecological management and development of agri-food systems (principles 1 through 7, i.e., recycling, input reduction, soil health, animal health, biodiversity, synergy, and economic diversification), others to the wider ranging socioeconomic, cultural and political approach (principles 8 through 13, i.e., co-creation of knowledge, social values and diets, fairness, connectivity, land and natural resource governance, and participation). The 13 principles thus integrate the 'WHAT' and the 'HOW' of a sustainable transformation of food systems. All agroecological principles contribute, in different direct and indirect ways, to food and nutrition security.

The systematic **integration of agroecological principles into the food systems framework** has the potential to effectively support the progressive achievement of sustainable food and nutrition security as defined in the SDG 2. In order to make this a reality, **multiple stakeholders** from the public and private sector, civil society, academia, and parliaments need to work together at various levels, starting and focusing at local level supported by the national and global level.

Context and scope of application of the framework

The German Government subscribes to agroecology and a food systems approach in its development cooperation with partner countries in its core area strategy "Sustainable Agri-Food Systems". In this core area, conflicts of interest such as those that exist between intensification and extensification, food and the protection of resources, economic activity and nature are weighed up and decided upon on a case-by-case basis. The key guidelines for dealing with these conflicts are sustainability in all its dimensions and the six quality criteria which are 1) human rights, 2) gender equality and disability inclusion, 3) anti-corruption and integrity, 4) poverty reduction and inequality reduction, 5) environmental and climate impact assessment, 6) conflict

5 HLPE. 2019. Agroecological and other innovative approaches for sustainable agriculture and food systems that enhance food security and nutrition. A report by the High Level Panel of Experts on Food Security and Nutrition of the Committee on World Food Security, Rome (www.fao.org/3/ca5602en/ca5602en.pdf), FAO. 2018. THE 10 ELEMENTS OF AGROECOLOGY GUIDING THE TRANSITION TO SUSTAINABLE FOOD AND AGRICULTURAL SYSTEMS (www.fao.org/3/i9037en/i9037en.pdf), and GIZ. 2020. Agroecology Factsheet (www.giz.de/en/downloads/giz2020_en_Agroecology_SV%20Nachhaltige%20Landwirtschaft_05-2020.pdf)

sensitivity ("Do Not Harm"), and 7) digital technology[6]. In addition, Germany and India agreed to focus their bilateral cooperation more strongly towards agroecological principles and signed a Joint Declaration of Intent on a Lighthouse Agroecology and Sustainable Natural Resource Management in May 2022.

In this context, the GIZ India Environment, Climate Change & Biodiversity Cluster commissioned the development of an analytical framework (based on the Food Systems and Agroecology approaches by the HLPE) in order to analyse this bilateral development portfolio consisting of 39[7] ongoing projects in 2022 for its contribution to a sustainable transformation of food systems through agroecology in selected parts of India where the cluster projects are operational.

2.2 Theory of Change

The theory of change (ToC) of an **integrated agroecology-food systems framework (FS/AE framework)** outlines 10 key pathways that are necessary for achieving transformation, focussing on crucial aspects such as sustainable and resilient production systems, efficient and inclusive supply chain management, connecting consumers and producers, addressing food security and nutrition, and strengthening policy environment. Each pathway has derived from Sub-dimensions of the food systems framework and the 13 agroecological principles outlined by the HLPE.

10 Pathways for Food Systems Transformation through Agroecology (formulated as hypotheses) are elaborated on following page:.

6 BMZ. 2021. Sustainable Agri-Food Systems. A World Without Hunger. Core Area Strategy. BMZ Paper 5 (https://www.bmz.de/en/news/publications/100758-100758)

7 As of June 2022

Theory of Change:
Food Systems Transformation through Agroecology

10 Pathways

1. If the primary **production systems** of agricultural and food products - focussing on small-scale producers, herders, and fisher folk - are based on an efficient use and **recycling** of local renewable resources, **reduction of external inputs**, preservation of **soil health, animal health, biodiversity**, and diversification without destroying hunters', gatherers' and indigenous people's livelihoods, then more sustainably produced and nutritious **food** is **available** and **accessible** for the primary producers.

2. If positive ecological interaction, integration and complementarity among the elements of agroecosystems (animals, crops, trees, soil and water) with a landscape approach can create **synergies**, then the effects for sustainable food supply will be even further enhanced.

3. If in addition to the primary production, **storage and trade, packaging and processing, retail and marketing of food** also follow the principles of **recycling** and **reduction of external inputs** and will ensure **food quality and safety** while preventing food losses, then the whole **food supply chain** will be more sustainable. Markets need to ensure **physical access** to **acceptable** and **affordable food** (economic access) for those consumers who do not produce themselves. Appropriate **information, guidelines and advertising** can and must be designed to support this connectivity and fairness as well as the functioning of markets. A proactive approach to **connectivity** links producers and consumers both in rural areas and from rural to urban areas and ensures proximity and confidence between them (i) through promotion of **fair** and short distribution networks and market access and (ii) by re-embedding food systems into local economies.

4. If these changes in the food supply chain can be realised, then farmers and other business actors can save on external inputs and realise **economic gains** that can be invested in further improvements in agroecology and improved diets or other elements of the food system.

*based on the Food Systems and Agroecology frameworks of the High Level Panel of Experts on World Food Security (HLPE)

10. If these key elements of the 'WHAT' are realised in such a way (the 'HOW') that gender sensitivity, inclusiveness, do-no-harm, **co-creation** and sharing **of knowledge** and innovations, **social values** of local communities and provision of healthy, diversified, seasonally and culturally appropriate **diets** (see pathway 6), **fairness** (see pathway 1), **connectivity** (see pathway 1), strengthened social organization and **participation** in decision-making by food producers and consumers prevail, then the pathway to sustainable food systems is paved.

9. If other **systems supporting food production/the food supply chains,** e.g., economic systems (including agriculture and agribusiness) and energy systems, also apply the 13 principles of agroecology, then the transformative effects on food systems will even be stronger.

8. If appropriate **policy and governance**, taking these agroecological principles and food systems dimensions into account, is ensured, then the chances for agroecological transformation of food systems to become a success are much higher than without such a favourable political environment.

7. If diets are improved in this way, the **positive nutrition and (diet related) health outcomes and broader economic, social and environmental impacts** can be expected.

6. If the **consumer behaviour** positively reacts to the more sustainable and nutritious food supply, **diets** will be improved in quality, quantity, diversity, safety and adequacy – either directly through the consumption of own production or indirectly through savings from less external input or incomes that are generated in the food supply chain or through economic diversification (see pathway 4).

5. If **economic diversification** of on-farm incomes is realised, then small-scale farmers have greater financial independence, value addition opportunities, and choices while enabling them to respond to demand from consumers.

If development measures, including projects, are implemented throughout all the above-described pathways in such a way that they strengthen people's, organisations and societies capacities for anticipation, absorption, adaptation and/or transformation of in the context of crises (be it acute shocks or chronic stresses), then they are more resilient to further crises in future.

This Theory of Change (reflecting an integrated agroecology-food systems framework) is further illustrated and elaborated for the envisaged mapping and analysis of the GIZ Environment, Climate Change & Biodiversity Cluster portfolio in India in Figure 1 (Analytical Integrated FS/AE Framework).

FIGURE 1: Analytical Integrated FS/AE Framework

2.3 Scope of Application of the Integrated Food Systems and Agroecology (FS/AE) Framework

The food systems framework recognises the complexity of relationships among the systems that support food production, food supply chains, food environments, the behaviours of individual consumers, diets, and nutritional and wider outcomes that feed back into the system. The systems that support food production include ecosystems, human systems, energy systems, economic systems (e.g., agricultural system) and health systems, which provide essential inputs into the food systems. Food supply chains draw on supporting ecological, human, energy and economic systems to produce and distribute food, while also providing livelihoods for those who work at various points in the production-to-distribution continuum.

In line with (i) the shift from seeing food and nutrition policy as a sectoral issue to viewing food systems as connected in complex ways with other sectors (health, agriculture, environment, culture) and systems (such as ecosystems, economic systems, social-cultural systems, energy systems and health systems) and (ii) the recognition of the interconnections between food systems and ecosystems, economic and market systems, health systems, and socio-economic systems, this integrated framework is expected to be applicable to all projects in the GIZ Environment, Climate Change & Biodiversity Cluster portfolio in India (in line with pathway 9).

The year 2023 marks the mid-point of implementation of the 2030 Agenda, but progress on achieving the Sustainable Development Goal (SDG) 2 'End hunger, achieve food security and improved nutrition and promote sustainable agriculture' is lacking behind

The foundation of this Cluster Portfolio Analysis conducted by Ecociate is rooted in the mapping, analysis, and scope of the integrated FS/AE framework. It serves as a narrative framework to illustrate how 'the Cluster' and the collaborative endeavors of all stakeholders participating in diverse development projects, (co)funded by the German Government, can play a role in fostering an agroecological transformation of food systems in India.

3 Methodology for Cluster Portfolio Analysis

3.1 Defining Scope

For conducting the Cluster Portfolio Analysis, a methodology based on the FS/AE framework was developed to:

i. *Construct a macro perspective of 'the Cluster',*

ii. *Map the current status of 'the Cluster' vis-à-vis FS/AE framework,*

iii. *Derive inputs for collaborative and synergetic opportunities within the cluster,*

iv. *Outline **WHAT** may be done amongst projects in synergetic mode (without answering the question as to **HOW** inter-project synergies may be developed), and*

v. *Suggest future potential areas to work on to move towards sustainable food systems transformation through agroecology.*

Since the purpose of this analysis was to encourage introspection and evoke thought and deliberation among 'the Cluster' projects, to seek opportunities for collaboration for synergistic action towards achieving FS/AE, the methodology developed did **not** aim to:

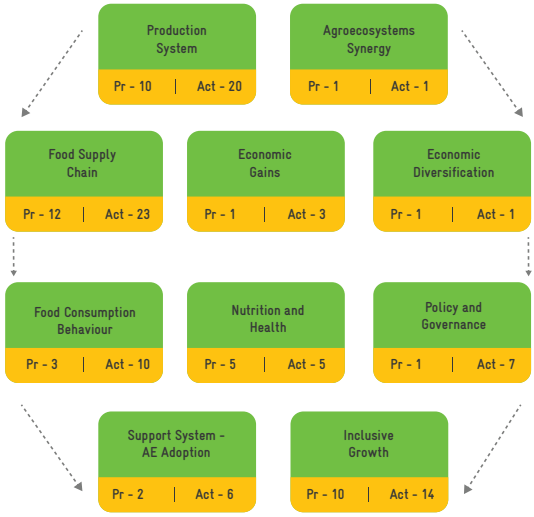
i. Assess the projects,

ii. Compare different projects, and

iii. Offer any subjective analysis of each project.

Figure 2 alongside illustrates the expanse of pathways based on constituent agroecological principles and Food Systems sub-dimensions and activities. The pathways 1 and 3 (Production Systems and Food Supply Chain respectively) included the highest number of sub-dimensions & activities, pathways 2 & 5 (Agroecosystems' Synergy and Economic Diversification respectively) had one (1) principle/sub-dimension each.

FIGURE 2: Concentration of principles, dimensions and activities in different pathways



3.2 Sampling

Ten (10) projects[10] listed below volunteered to participate in this Cluster Portfolio analysis.

i. SuATI: Support to Agroecological Transformation Processes in India

ii. SENU: Securing Nutrition, Enhancing Resilience

iii. OHA: One Health and Agroecology,

iv. ERADA: Enhancing Rural Resilience through Appropriate Development Actions,

v. NERAQ: Protection and Sustainable Management of Aquatic Resources in the Northeastern Himalayan Region of India,

vi. ProSoil: Soil Protection and Rehabilitation of Degraded Soil for Food Security,

vii. FES: Sustainable Management of Forest Ecosystem Services,

viii. SAFAL: Sustainable Aquaculture for Food and Livelihood,

ix. DPP Spices: DPP Spices Project on Establishing Sustainable Spice Supply Chain in four states of India, and

x. GIC for the Agriculture and Food Sector.

10 The detail description of all ten projects is included as an annexure 7.2.

3.3 Tool Development

In order to elicit information from ten (10) projects of 'the Cluster' that participated in this analysis, Ecociate converted each activity into a question for capturing the applicability for each respondent (a project being considered as a respondent) and developed two tools.

In Sep 2022, for phase 1 of information gathering, 'Tool 1' requested projects to identify five (5) pathways most relevant for the project and rank them according to priority. In the second phase, 'Tool 2' deep dived down to the activity level happened in October 2022 and requested responding projects to select from four options: i) ongoing, ii) planning, iii) completed, or iv) not considered. *(Tool 1 & Tool 2 may be found at Annexure 2: Tools developed by Ecociate for obtaining information from projects)*.

The analysis was conducted at the level of pathways, principles and activities and a cluster narrative was developed. Further, synergy was explored at pathway, state and programmatic levels. In an attempt to demonstrate, how collaborative efforts may yield synergistic impact, SENU as an evolved initiative has been documented in the chapter 6 of this report.

FIGURE 3: Overlay of pathways, priciple and activities

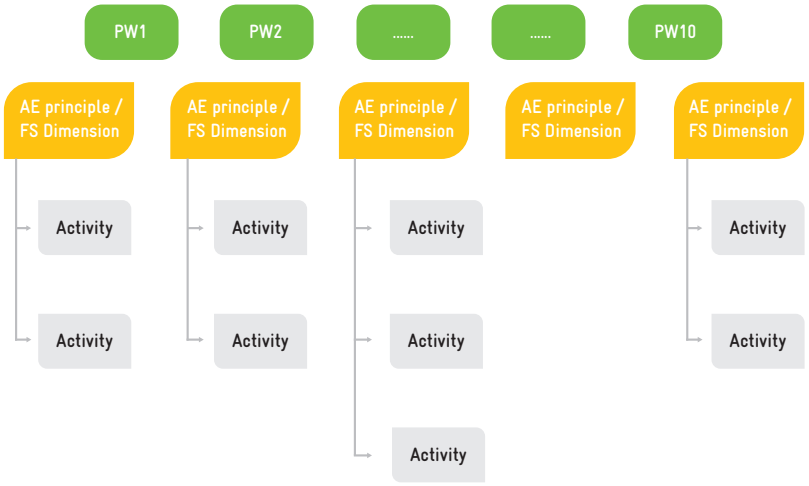
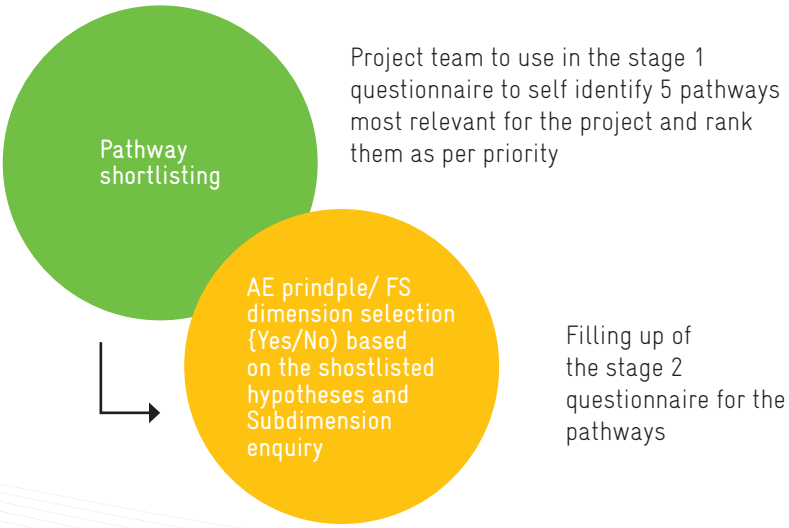


FIGURE 4: Two stages of data collection for Cluster Portfolio Analysis



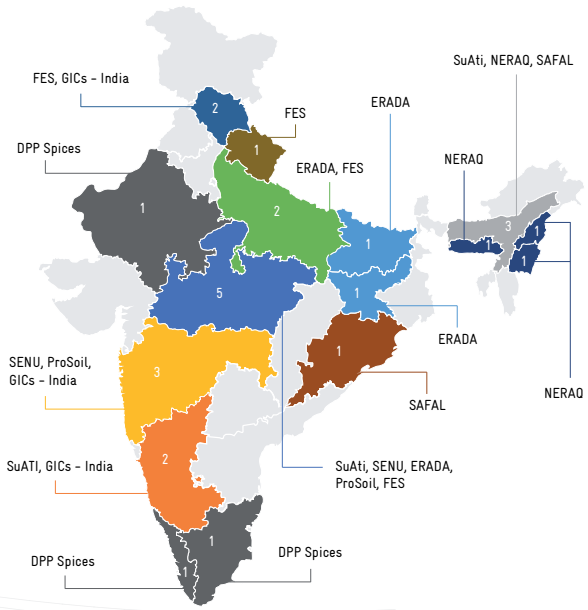
4 Findings and Analysis

Level
Pathway
Principle
Activity

4.1 Pathways at the Cluster Level

This section presents a cluster level status of the ten pathways which comprise the FS/AE framework and provides a profile of the cluster and pathways wise ranking, coverage and depth of engagement.

FIGURE 5: State Coverage



Profile of the Cluster

The ten (10) projects sampled were operating in 16 states of India namely Madhya Pradesh, Uttar Pradesh, Uttarakhand, Rajasthan, Himachal Pradesh, Tamil Nadu, Karnataka, Kerala, Maharashtra, Meghalaya, Assam, Nagaland, Manipur, Bihar, Odisha and Jharkhand (ref the India map on page 22), in joint collaboration with six (6) political partners namely:

1. Ministry of Agriculture and Farmers' Welfare,
2. Ministry of Women and Child Development,
3. Ministry of Rural Development,
4. Ministry of Fisheries, Animal Husbandry and Dairying,
5. Ministry of Environment, Forest, and Climate Change, and
6. National Bank for Agriculture and Rural Development (NABARD).

TABLE 2: Thematic Focus of sample projects

Project	Focus area
SUATI	Agroecology
SENU	Nutrition
OHA	One Health (human, animal & environmental health)
ERADA	Livelihoods (diversification & alternatives)
NERAQ	Aquatic Ecosystem Conservation
ProSoil	Soil Protection and Rehabilitation
FES	Forest Ecosystems Approach (Water)
SAFAL	Sustainable Aquaculture (Fish)
DPP Spice	Sustainable Farming (Spices)
GIC - India	Agri-innovations (Potato, Tomato, Apple)

The ten projects had various focus areas covering agroecology, nutrition, livelihoods, water, aquaculture etc. which is illustrated in table 2 alongside. The detail description of all ten projects is included as an annexure 7.2.

Pathway Coverage, Ranking and Depth of Engagement:

Pathway Wise Project Coverage

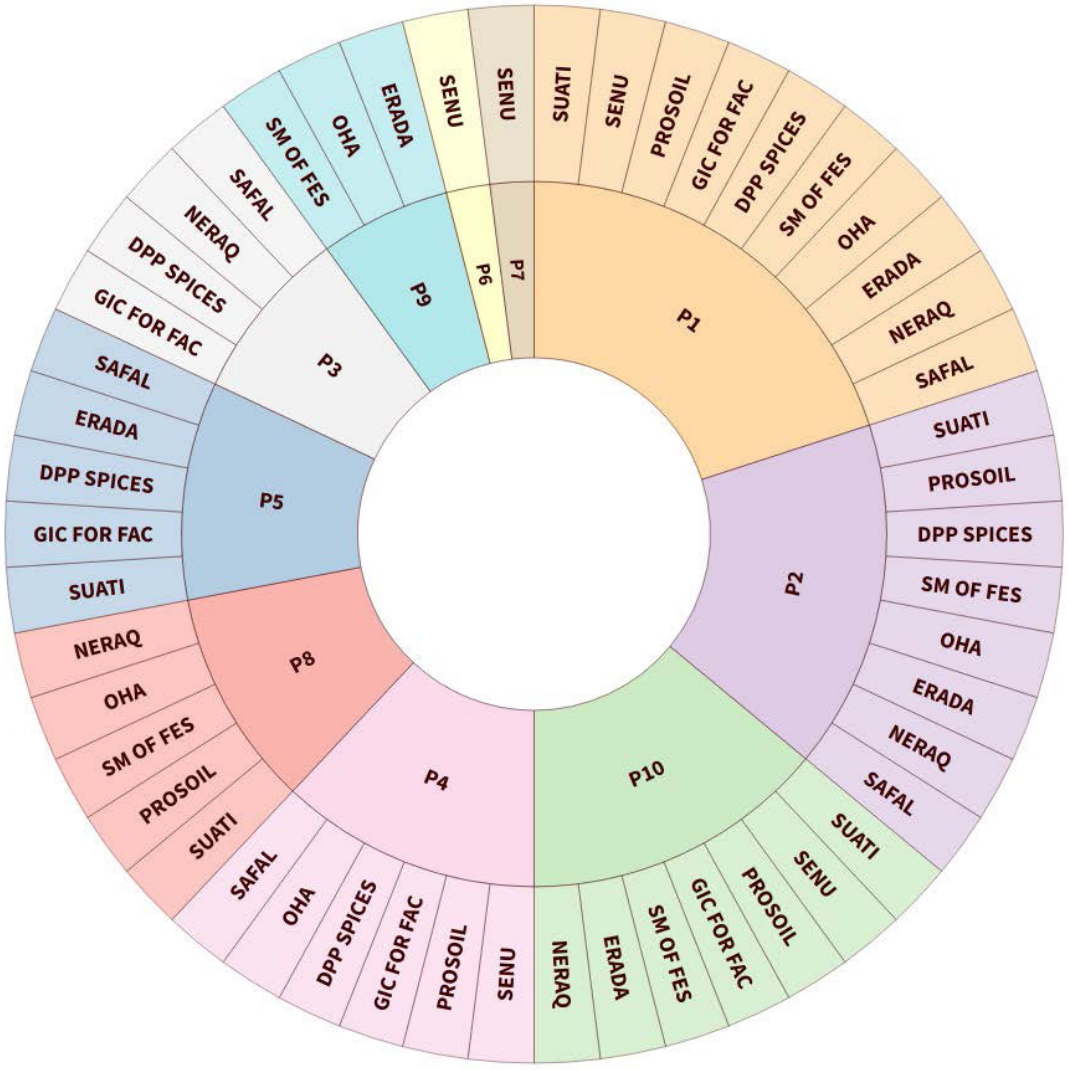
On mapping the projects to pathways in terms of coverage, the following emerged:

Pathway 1 (production systems) was applicable for all projects.

i. Pathways 2, 10 & 4 (agroecosystems' synergy, inclusive growth, economic gains) were applicable for more than 60% of the projects.

ii. Pathways 3, 6, 7 and 9 (food supply chain, food consumption behaviour, nutrition and health, support systems – agroecology adoption) were applicable for less than 40% of the projects.

FIGURE 6: Pathway wise project coverage



Ranking of Pathways by Projects

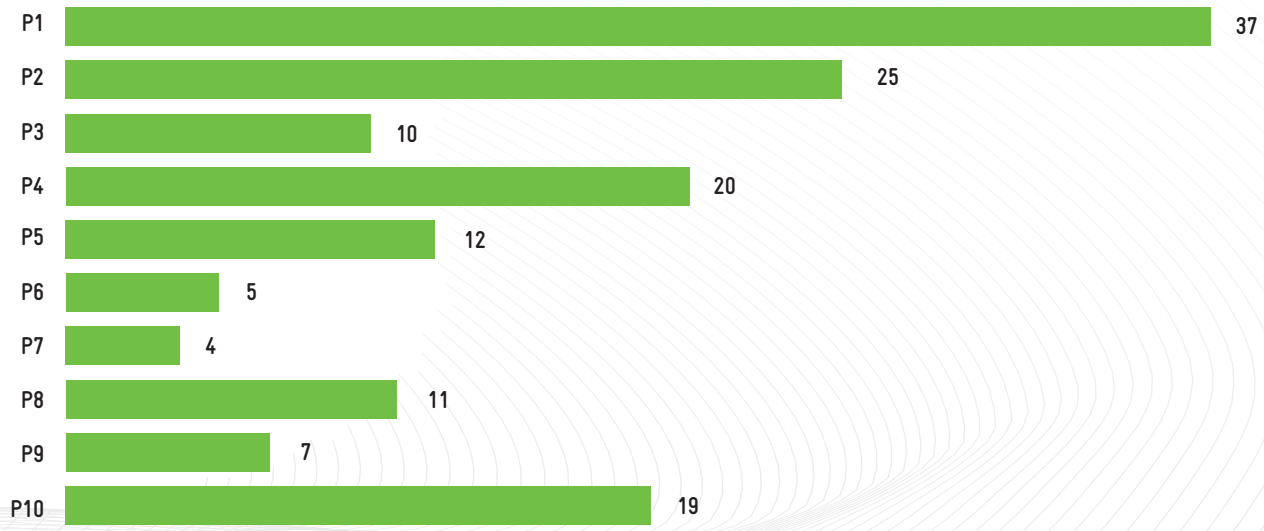
The projects ranked the pathways on a scale of 1 to 5. Rank 1 was associated with 5 points (which was the highest), rank 2 with 4 points, rank 3 with 3 points, rank 2 with 2 points and rank 1 with 1 point (which was the lowest). Hence, a pathway ranked 1 by all projects would receive the maximum score of 50.

FIGURE 7: Ranking of Pathways by projects

Diversity in Ranking of Pathways by Projects

Overall, diversity in ranking by the projects was observed. Pathway 1 (production systems) featured most prominently within rank 1 and 2 and received the highest weighted score of 37, followed by pathway 2 (weighted score: 25), pathway 4 (weighted score: 20) and pathway 10 (weighted score 19). Figure 8 shows the weightage of each pathway.

FIGURE 8: Diversity in ranking of Pathways



Depth of Engagement in Pathways

On analysing the depth of engagement (as a percentage) first at the level of principles and then at the level of activities (tabulated below), wave diagrams revealed that while engagement at the level of principles was high (indicated by the larger area covered by the polygon), there was scope of improving the depth of engagement at activity level (indicated by a smaller area enclosed within the polygon).

FIGURE 9: Engagement by Principles

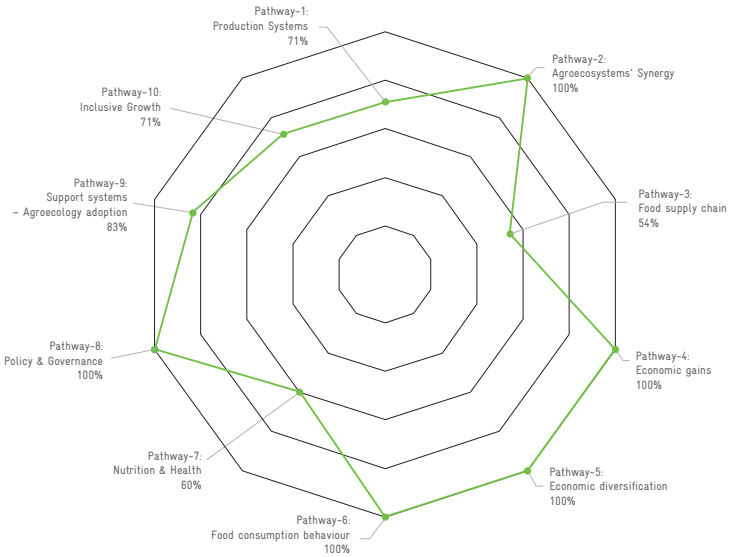


FIGURE 10: Engagement by Activities

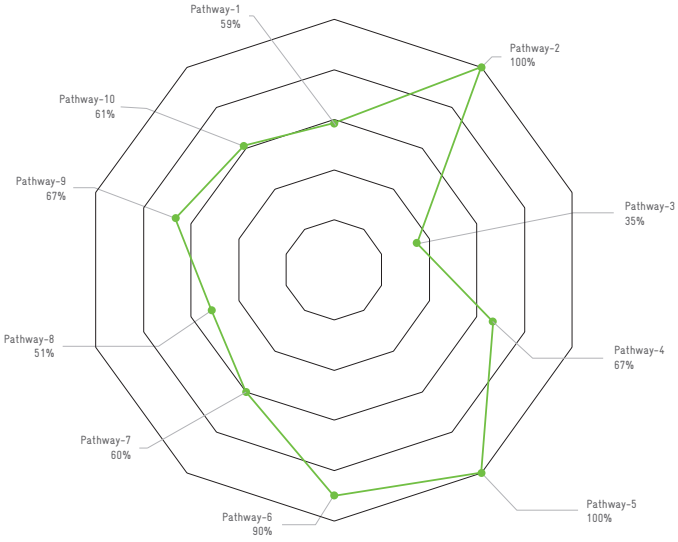


Table 3 presents the data in tabular form and points towards the need for deeper engagement at the level of activities in a majority of the pathways especially, production systems, food supply chain and policy and governance for which the coverage of activities was 50% or less.

TABLE 3: Extent of engagement at the level of principles and activities

Pathway	Extent of engagement* at level of principles	Extent of engagement* at level of activities
1: Production Systems	71%	50%
2: Agroecosystems' Synergy	100%	100%
3: Food supply chain	54%	35%
4: Economic gains	100%	67%
5: Economic diversification	100%	100%
6: Food consumption behaviour	100%	90%
7: Nutrition and health	60%	60%
8: Policy and governance	100%	51%
9: Support System – Agroecology adoption	83%	67%
10: Inclusive growth	71%	61%

*E.g.: Among all the projects who have participated in pathway-3, the cumulative presence against the 12 principles show that 56% of total possible principles coverage has been achieved by the projects.

Presence of projects across pathways & principles

Pathways	Principles	SuATI	SENU	OHA[11]	ERADA	NERAQ	SAFAL	DPP	ProSoil	FES	GIC
Pathway-1: Production Systems	Recycling	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
	Reduction of external inputs	✔	✔	✔			✔	✔	✔	✔	✔
	Soil health	✔	✔	✔			✔	✔	✔	✔	
	Animal health			✔	✔				✔		
	Biodiversity	✔	✔	✔		✔		✔	✔	✔	
	Connectivity	✔	✔		✔		✔		✔	✔	✔
	Fairness	✔	✔			✔		✔		✔	
	Production systems	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
	Availability of food	✔	✔		✔	✔	✔	✔		✔	
	Access to food	✔	✔	✔			✔	✔	✔	✔	
Pathway-2: Agroecosystems' Synergy	Synergies	✔		✔	✔	✔	✔	✔	✔	✔	
Pathway-3: Food supply chain	Storage and trade					✔	✔	✔			✔
	Packaging and processing							✔			✔
	Retail and marketing						✔	✔			✔
	Recycling							✔			✔
	Reduction of external inputs						✔	✔			✔
	Food supply chains						✔	✔			
	Physical access to food										
	Economic access to food (affordability)					✔	✔				
	Acceptability					✔	✔	✔			
	Promotion, info., guidelines & advt.						✔				
	Connectivity						✔				
	Fairness					✔	✔	✔			
Pathway-4: Eco. Gains	Economic gains		✔	✔			✔	✔	✔		✔
Pathway-5: Eco. Diversification	Economic diversification	✔			✔		✔	✔			✔
Pathway-6: Food consumption behaviour	Consumer behaviour		✔								
	Diets		✔								
	Promotion, Information, guidelines and advertising		✔								
Pathway-7: Nutrition & Health	Nutrition outcomes		✔								
	Health outcomes (diet related)			✔							
	Broader economic impacts										
	Broader social impacts		✔								
	Broader environmental impacts		✔	✔							
Pathway-8: Policy & Governance	Policy and governance	✔		✔		✔			✔	✔	
Pathway-9: Support systems – AE adoption	Systems supporting food production/ food supply chains			✔	✔					✔	

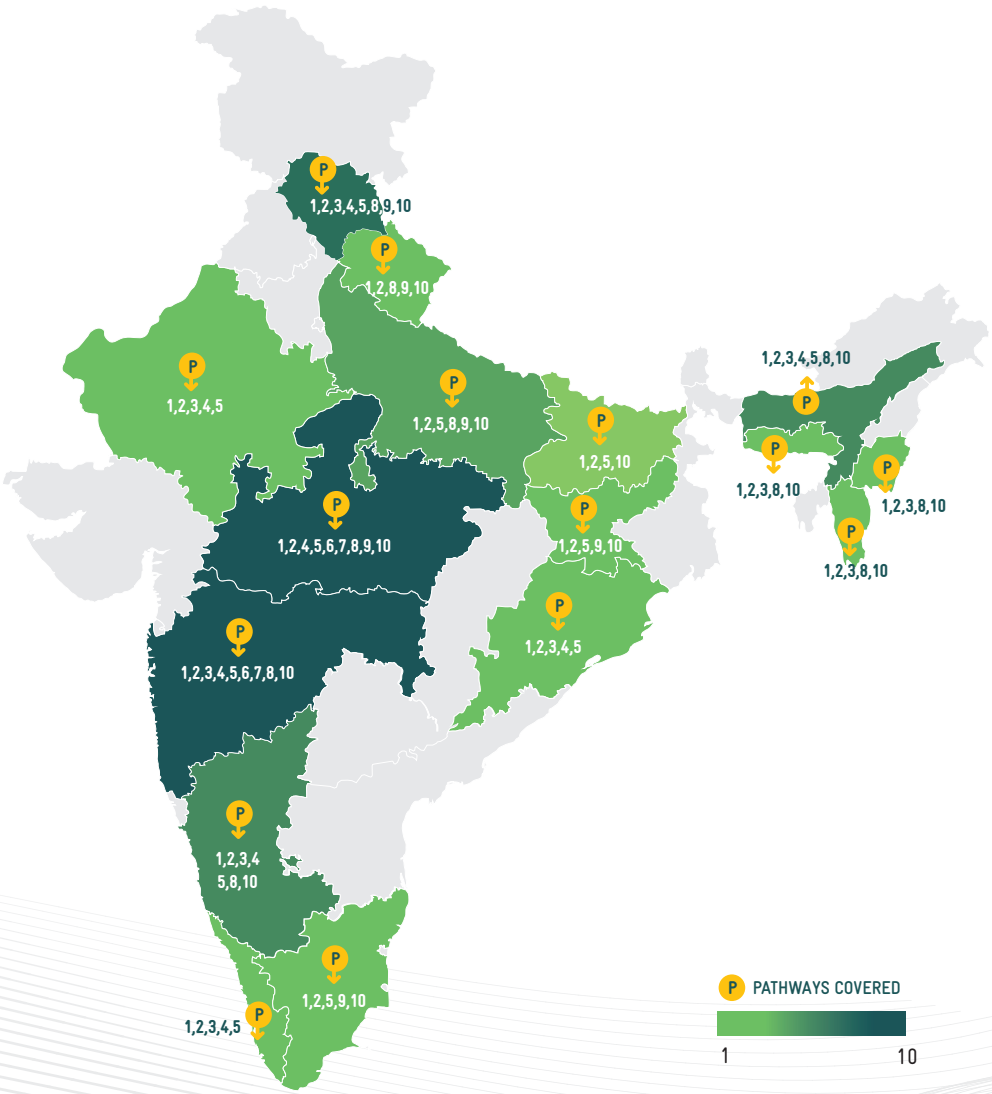
11 For the OHA Project, the specific topics still need to be defined in collaboration with the nodal ministry. Right now it's not clear if the project will work on topics like recycling or access to food. The importance of the aspect "economic gains" will also depend a lot on the topics to be chosen.

Pathways	Principles	SuATI	SENU	OHA[11]	ERADA	NERAQ	SAFAL	DPP	ProSoil	FES	GIC
Pathway-10: Inclusive Growth	13 principles of AE (as relevant)			✔						✔	
	Gender Sensitivity	✔	✔		✔				✔	✔	
	Inclusiveness	✔	✔		✔	✔			✔	✔	
	Do-no-harms	✔	✔			✔			✔	✔	
	Co-creation of knowledges	✔	✔		✔	✔			✔	✔	✔
	Social values	✔	✔		✔	✔			✔	✔	
	Diets (healthy, diversified, seasonally and culturally appropriate)	✔	✔			✔				✔	
	Acceptability	✔	✔		✔						
	Fairness	✔	✔		✔					✔	
	Connectivity	✔	✔		✔					✔	
	Participation	✔	✔		✔	✔			✔	✔	

State and Pathways:

Maximum projects were located in three states namely Madhya Pradesh, Maharashtra and Assam. Together, projects in Madhya Pradesh covered the maximum number of pathways including 1, 2, 4, 5, 6, 7, 8, 9 and 10. Pathways 1, 2, 5 and 10 were covered in maximum number of states.

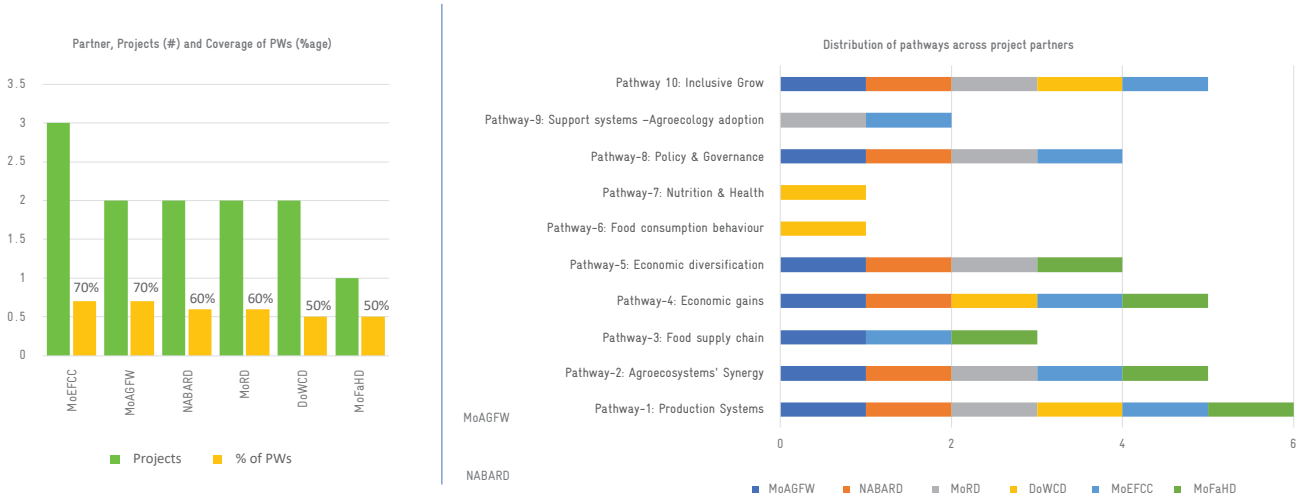
FIGURE 11: Number of Projects per State and Distribution of Pathways across Project States



Political Partners and Pathways:

The maximum uptake of pathways by political partners was 70% covering pathways 1 (Production systems), 2 (Agroecosystems' synergy), 4 (Economic gains) and 10 (Inclusive growth), by Ministry of Agriculture and Farmers' Welfare (MoA&FW) and Ministry of Environment, Forest and Climate Change (MoEFCC). In contrast pathways 6 (Food consumption behaviour), 7 (Nutrition and health) and 9 (Support systems- Agroecology adoption) had the least uptake amongst the political partners.

FIGURE 12: Political Partners and Pathways



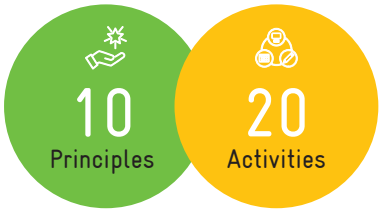
4.2 Pathways – Deep Dive

This section aims to dive deeper into each of the ten pathways of the FS/AE framework, to identify for each pathway, (1) the activities that were prominently covered by the cluster projects, (2) those which needed further strengthening and (3) others which presented no evidence in the cluster. This pathway-wise analysis also provides suggestions for exploring opportunities for building synergy among projects. The purpose of this section is to provide to the project leads a basis for deliberations and discussions to explore answers to the 'Why' and 'How' of collaborating with and complimenting each other, to accelerate their progress towards achieving FS/AE goals. For ease of reading, the analysis has been presented as a status card for each pathway and summarised in Section 5 as a cluster narrative.

Pathway-1: Production Systems

Pathway Definition

If the primary **production systems** of agricultural and food products – focussing on small-scale producers, herders, and fisher folk – are based on an efficient use and ***recycling*** of local renewable resources, ***reduction of external inputs***, preservation of ***soil health, animal health***, ***biodiversity***, and diversification without destroying hunters', gatherers' and indigenous people's livelihoods, then more sustainably produced and nutritious **food** is **available** and **accessible** for the primary producers.



Pathway Structure

Principle	Activity
Recycling	Focus on preferential use of local renewable resources
	Closure (as far as possible) of nutrients and biomass resource cycles
Reduction of external inputs	Reducing or eliminating dependency on purchased/external inputs and increased self-sufficiency
Soil health	Focus on soil health and functioning for improved plant growth, particularly by managing organic matter and enhancing soil biological activity
Animal health	Focus on animal health and welfare
Biodiversity	Work on diversity of species, functional diversity and genetic resources Also, maintained overall agroeco-system biodiversity in time and space at field, farm and landscape scales
Connectivity	Ensure proximity and confidence between producers and consumers through promotion of fair and short distribution networks and by re-embedding food systems into local economies
Fairness	Focus on dignified and robust livelihoods for all actors engaged in food systems, especially small-scale food producers, based on fair trade, fair employment and fair treatment of intellectual property rights
Production systems	Improve landscape and dietary diversity
	Safeguard Globally Important Agriculture Heritage Systems (GIAHS) in traditional and mixed food systems
	Provide incentives to protect wild foods, local agrobiodiversity in traditional food systems
	Improve the links of local farms to school meals
	Promote urban agriculture in mixed and modern food systems
	Improving women producers' livelihoods
	Redirect agricultural research and development for diets
	Scale up climate-smart, nutrition-sensitive approaches
Availability of food	Ensure more sustainably produced, nutritious food is available in the country/region, on markets/in stores
	Address food deserts and food swamps in mixed and modern food systems
	Encourage healthier diets through public procurement of foods
Access to food	Ensure that food producing households have more sustainably produced, nutritious food in their houses (ready for use)

Pathway Coverage

Projects covered	State covered	Partner Covered
10/10	16/16	6/6

Deep Dive into the participation within the pathway

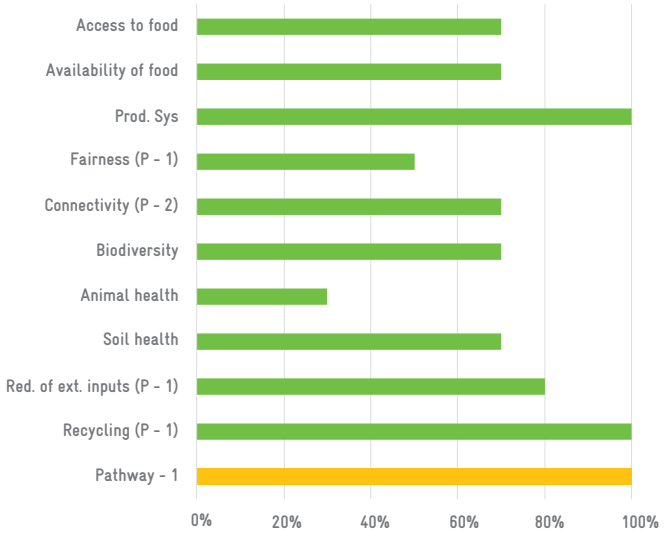
As per principles:

This pathway included 10 principles and 20 activities. It was covered by all the ten projects in all 16 states and amongst all the 6 political partners. The projects which reported having a focus on this pathway included SuATI, SENU, OHA, ERADA, NERAQ, SAFAL, DPP Spices, FES, GIC-India and ProSoil.

However, at the level of principles, there was a scope of enhancing focus on animal health, fairness, access to food, availability of food, connectivity, biodiversity and soil health.

At the level of activities, recycling was significantly covered to the extent of 90%. Out of 8 activities, 3 were being undertaken by at least 80% of projects. The remaining activities were being undertaken by 50% of the projects. Activities pertaining to availability of food were included by more than 60% of the projects.

Engagement level of projects in various principles



As per activities:

All projects were requested to mention the status of engagement in various activities aligned to the principles and pathways. The projects identified each activity as either under planning (P) or ongoing (O) or completed (C) or not covered. The shaded table below show the engagement status against each activity for the projects while presenting an overall cluster level snapshot.

Principle	Activity	SuATI	SENU	OHA[12]	ERA DA	NE RAQ	SAFAL	DPP Spices	Pro Soil	FES	GIC-India
Recycling	Focus on preferential use of local renewable resources	P	P	P	O	O	O	O	O	O	O
	Closure (as far as possible) of nutrients and biomass resource cycles	P	O	P	O	O	O	O	O	O	
Reduction of external inputs	Reducing or eliminating dependency on purchased/external inputs and increased self-sufficiency	P	O	P			O	O	O	O	O
Soil health	Focus on soil health and functioning for improved plant growth, particularly by managing organic matter and enhancing soil biological activity	P	O	P			O	O	O	O	
Animal health	Focus on animal health and welfare			P	P				C		
Biodiversity	Work on diversity of species, functional diversity and genetic resources Also, maintained overall agroecosystem biodiversity in time and space at field, farm and landscape scales	P	P	P		O		O	O	O	

12 All the details mentioned in this table for the OHA Project haven't been decided yet by the nodal ministry.

Principle	Activity	SuATI	SENU	OHA[12]	ERA DA	NE RAQ	SAFAL	DPP Spices	Pro Soil	FES	GIC-India
Connectivity	Ensure proximity and confidence between producers and consumers through promotion of fair and short distribution networks and by re-embedding food systems into local economies	P	O		P		O		C	O	O
Fairness	Focus on dignified and robust livelihoods for all actors engaged in food systems, especially small-scale food producers, based on fair trade, fair employment and fair treatment of intellectual property rights	P	O			O		O		O	
Production systems	Improve landscape and dietary diversity	P	O	P	P		O	O	O	O	
	Safeguard Globally Important Agriculture Heritage Systems (GIAHS) in traditional and mixed food systems	P		P			O	O		P	
	Provide incentives to protect wild foods, local agrobiodiversity in traditional food systems					O	O	O	O	O	
	Improve the links of local farms to school meals	P								P	
	Promote urban agriculture in mixed and modern food systems									O	
	Improving women producers' livelihoods	P	O	P	O	O	O	O	O	P	O
	Redirect agricultural research and development for diets	O	O	P			O		C		
	Scale up climate-smart, nutrition-sensitive approaches	P	P	P	P		O	O	O	O	P
Availability of food	Ensure more sustainably produced, nutritious food is available in the country/region, on markets/in stores	P			O	O	O	O		P	
	Address food deserts and food swamps in mixed and modern food systems									O	
	Encourage healthier diets through public procurement of foods	P	O								
Access to food	Ensure that food producing households have more sustainably produced, nutritious food in their houses (ready for use)	P	O	P			O	O	O	P	

P Planned, O Ongoing, C Completed

Potential Synergies

In terms of scope of building synergy, this pathway was found to be well represented across states and partners and may thus serve as the starting point for convergence and synergy among projects. However, unless greater engagement is demonstrated by projects and partners towards connectivity, animal health and fairness principles, the scope for synergistic growth will remain curtailed especially with respect to pathways 6 (Food Consumption) and 10 (Inclusive Growth).

Pathway-2: Agroecosystems' Synergy

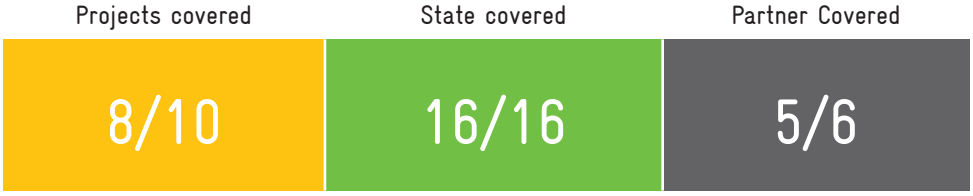
Pathway Definition

If positive ecological interaction, integration and complementarity among the elements of agroecosystems (animals, crops, trees, soil and water) with a landscape approach can create ***synergies***, then the effects for sustainable food supply will be even further enhanced.

Pathway Structure

Principle	Activity
Synergies	Enhance positive ecological interaction, synergy, integration, and complementarity among the elements of agroecosystems (animals, crops, trees, soil and water)

Pathway Coverage

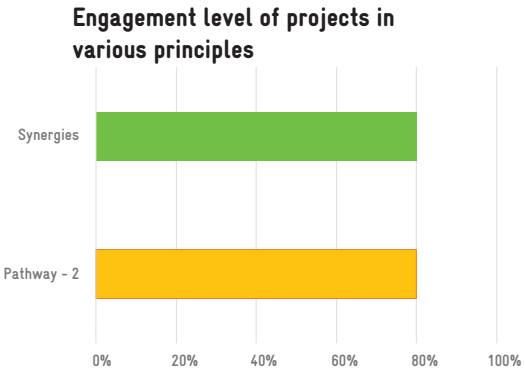


Pathway Status

As per principles:

This pathway comprised of 1 principle and 1 activity, was covered by 8 out of 10 projects in all 16 states and had an uptake by 5 out of 6 political partners. The projects which covered this pathway were SuATI, OHA, ERADA, SAFAL, DPP Spices, ProSoil and FES.

In order to reveal the unique strengths of the cluster with respect to this pathway, a more detailed analysis would be required to understand how the projects have worked on developing agroecosystems' synergies.



As per activities:

All projects were requested to mention the status of engagement in various activities aligned to the principles and pathways. The projects identified each activity as either under planning (P) or ongoing (O) or completed (C). The shaded table below show the status against each activity and project while presenting an overall cluster level snapshot.

Principle	Activity	SuATI	SENU	OHA	ERA DA	NE RAQ	SAFAL	DPP Spices	Pro Soil	FES	GIC-India
Synergies	Enhance positive ecological interaction, synergy, integration and complementarity among the elements of agroecosystems (animals, crops, trees, soil and water)	P		P	P	O	O	O	O	O	

P Planned, O Ongoing, C Completed

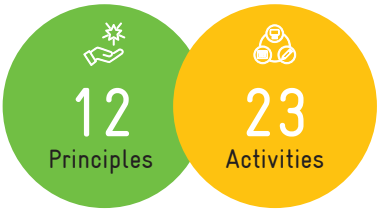
Potential Synergies

This pathway has a significant role in building synergy since it brings together the various components under a landscape approach. It may serve as the basis for identifying commonalities among projects and developing a common strategic outlook at the cluster level. Examining opportunities in project SuATI may provide pointers for developing cluster level directions.

Pathway-3: Food Supply Chain

Pathway Definition

If in addition to the primary production, **storage and trade**, **packaging and processing**, **retail and marketing** of food also follow the principles of ***recycling*** and ***reduction of external inputs*** and will ensure **food quality and safety** while preventing food losses, then the whole **food supply chain** will be more sustainable. Markets need to ensure **physical access** to **acceptable** and **affordable food** (economic access) for those consumers who do not produce themselves. Appropriate **information, guidelines and advertising** can and must be designed to support this connectivity and fairness as well as the functioning of markets. A proactive approach to ***connectivity*** links producers and consumers both in rural areas and from rural to urban areas and ensures proximity and confidence between them (i) through promotion of ***fair*** and short distribution networks and market access and (ii) by re-embedding food systems into local economies.



Pathway Structure

Principle	Activity
Storage and trade	Reduce food losses and waste
	Preserve food safety during storage and distribution in traditional and mixed food systems
Packaging and processing	Preserve food safety during storage and distribution in traditional and mixed food systems
	Facilitate as appropriate, the use of food fortification in traditional and mixed food systems
Retail and marketing	Focus on improving connectivity of smallholders to markets in traditional and mixed food systems
	Encourage supermarkets to procure "healthier" foods in mixed and modern food systems
	Support farmer connectivity through information technology
Recycling	Focus on preferential use of local renewable resources
	Closure (as far as possible) of nutrients and biomass resource cycles
Reduction of external inputs	Reduce or eliminate dependency on purchased/external inputs and increased self-sufficiency
Food supply chains	Ensure developing a chain from production systems (see pathway 1) through storage and trade, packaging and processing to retail and marketing (see above)
Physical access to food	Address food deserts and food swamps in mixed and modern food systems
	encourage healthier diets through public procurement of foods
Economic access to food (affordability)	Promote healthier diets through discriminatory trade policies
	Encourage healthier diets through taxes and subsidies
	Promoted healthier diets through price promotions in mixed and modern food systems
	Understood the effect of remittances on nutrition status in traditional food systems
Acceptability	Ensure that People's attitudes about attributes of their local food environment and whether the given supply of products meets their personal standards; can be influenced through promotion, information, guidelines, and advertising
Promotion, information, guidelines and advertising	Promoted healthier food options
	Strengthened regulations for advertising and marketing
	Increased transparency of information on labels
Connectivity	Ensure proximity and confidence between producers and consumers through promotion of fair and short distribution networks and by re-embedding food systems into local economies
Fairness	Focus on dignified and robust livelihoods for all actors engaged in food systems, especially small-scale food producers, based on fair trade, fair employment and fair treatment of intellectual property rights

Pathway Coverage

Projects covered	State covered	Partner Covered
4/10	11/16	3/6

Pathway Status

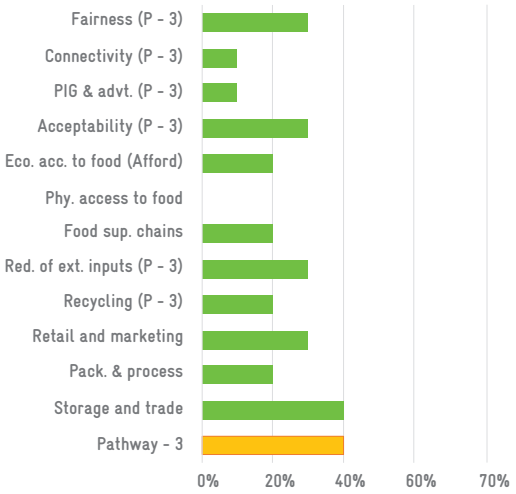
As per principles:

This pathway with 12 principles and 23 activities, was covered by 4 out of 10 projects, in 11 out of 16 states with an uptake by 3 out of 6 political partners. The projects working along this pathway were SAFAL, NERAQ, DPP Spices and GIC-India.

60% of the projects did not cover this pathway. Physical access to food was not a focus of 4 out of 10 projects. Out of 12 principles under this pathway, 7 were not being covered by most of the projects.

At the level of activities, storage and trade was covered by 4 out of 10 projects. In addition, activities related to fairness, acceptability, reduction of external inputs, and retail and marketing were covered by 3 out of the 4 projects.

Engagement level of projects in various principles



As per activities:

All projects were requested to mention the status of engagement in various activities aligned to the principles and pathways. The projects identified each activity as either under planning (P) or ongoing (O) or completed (C). The shaded table below show the status against each activity and project while presenting an overall cluster level snapshot.

Principle	Activity	SuATI	SENU	OHA	ERA DA	NE RAQ	SA-FAL	DPP Spic-es	Pro Soil	FES	GIC-India
Storage and trade	Reduce food losses and waste						O				O
	Preserve food safety during storage and distribution in traditional and mixed food systems					O		O			
Packaging and processing	Preserve food safety during storage and distribution in traditional and mixed food systems							O			O
	Facilitate as appropriate, the use of food fortification in traditional and mixed food systems										
Retail and marketing	Focus on improving connectivity of smallholders to markets in traditional and mixed food systems						O	O			O
	Encourage supermarkets to procure "healthier" foods in mixed and modern food systems										
	Support farmer connectivity through information technology						P	O			C
Recycling	Focus on preferential use of local renewable resources							O			O
	Closure (as far as possible) of nutrients and biomass resource cycles							O			
Reduction of external inputs	Reduce or eliminate dependency on purchased/ external inputs and increased self-sufficiency						O	O			O

Principle	Activity	SuATI	SENU	OHA	ERA DA	NE RAQ	SA-FAL	DPP Spic-es	Pro Soil	FES	GIC-India
Food supply chains	Ensure developing a chain from production systems (see pathway 1) through storage and trade, packaging and processing to retail and marketing (see above)						O	O			
Physical access to food	Address food deserts and food swamps in mixed and modern food systems										
	encourage healthier diets through public procurement of foods										
Economic access to food (affordability)	Promote healthier diets through discriminatory trade policies										
	Encourage healthier diets through taxes and subsidies										
	Promoted healthier diets through price promotions in mixed and modern food systems						P				
	Understood the effect of remittances on nutrition status in traditional food systems					P	P				
Acceptability	Ensure that People's attitudes about attributes of their local food environment and whether the given supply of products meets their personal standards; can be influenced through promotion, information, guidelines, and advertising					P	P	P			
Promotion, information, guidelines and advertising	Promoted healthier food options						O				
	Strengthened regulations for advertising and marketing										
	Increased transparency of information on labels						O				
Connectivity	Ensure proximity and confidence between producers and consumers through promotion of fair and short distribution networks and by re-embedding food systems into local economies						O				
Fairness	Focus on dignified and robust livelihoods for all actors engaged in food systems, especially small-scale food producers, based on fair trade, fair employment and fair treatment of intellectual property rights					O	O	O			

P Planned, O Ongoing, C Completed

Potential Synergies

A value chain focused orientation would enable projects to build on the principles and action the activities of this pathway and identify commonalities and complementarities with pathways 1 (production systems), 6 (food consumption), 9 (support systems – agroecology adoption) and 10 (inclusive growth).

Pathway-4: Economic Gains

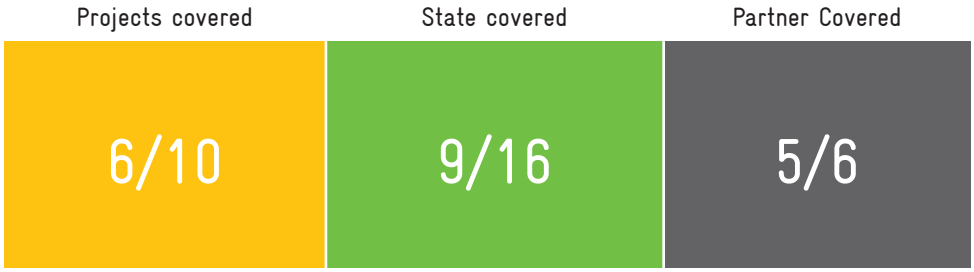
Pathway Definition

If these changes in the food supply chain can be realised, then farmers and other business actors can save on external inputs and realise **economic gains** that can be invested in further improvements in agroecology and improved diets or other elements of the food system.

Pathway Structure

Principle	Activity
Economic gains	Reinvest in agroecology by realising changes in the food supply chain and saving on external inputs and realising economic gains for the farmers and business actors
	Reinvest in improved diets by realising changes in the food supply chain and saving on external inputs and realising economic gains for the farmers and business actors
	Reinvest in other elements of the food system (e.g., food supply chain) by realising changes in the food supply chain and saving on external inputs and realising economic gains for the farmers and business actors

Pathway Coverage



Pathway Status

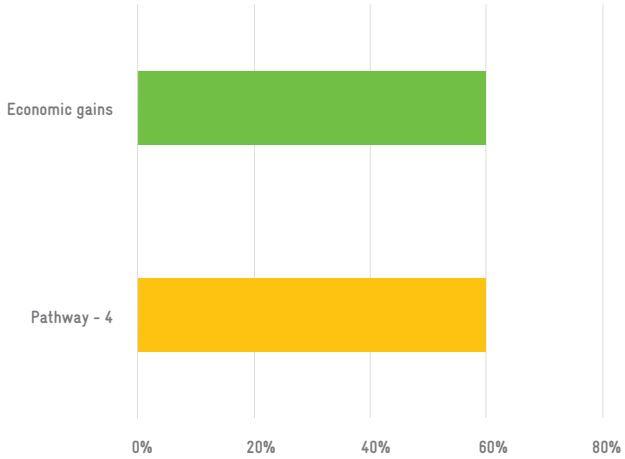
As per principles:

This pathway comprised of 1 principle and 3 activities was covered by 6 out of 10 projects in 9 out of 16 states with an uptake by 5 out of 6 political partners. The projects that reported having a focus on this pathway were SENU, OHA, SAFAL, DPP Spices, ProSoil and GIC-India.

At the level of principles, 40% of the projects did not have a focus on economic gains.

At the level of activities, only 1 out of 3 activities had less than 30% coverage.

Engagement level of projects in various principles



As per activities:

All projects were requested to mention the status of engagement in various activities aligned to the principles and pathways. The projects identified each activity as either under planning (P) or ongoing (O) or completed (C). The shaded table below show the status against each activity and project while presenting an overall cluster level snapshot.

Principle	Activity	SuATI	SENU	OHA	ERA DA	NE RAQ	SA-FAL	DPP Spic-es	Pro Soil	FES	GIC-India
Economic gains	Reinvest in agroecology by realising changes in the food supply chain and saving on external inputs and realising economic gains for the farmers and business actors		O	P			O	O	O		O
	Reinvest in improved diets by realising changes in the food supply chain and saving on external inputs and realising economic gains for the farmers and business actors		O				O	O	O		
	Reinvest in other elements of the food system (e.g., food supply chain) by realising changes in the food supply chain and saving on external inputs and realising economic gains for the farmers and business actors						O	O			

P Planned, O Ongoing, C Completed

Potential Synergies

The cluster may deliberate on bridging the gaps at the principle and activity level for increasing wider adoption among the projects.

All 6 projects having a focus on this pathway, may find it useful to collaborate across states to learn from each other about the scope, opportunities and challenges related to interventions targeted at enhancing economic gains.

Pathway-5: Economic Diversification

Pathway Definition

If ***economic diversification*** of on-farm incomes is realised, then small-scale farmers have greater financial independence, value addition opportunities, and choices while enabling them to respond to demand from consumers.

Pathway Structure

Principle	Activity
Economic diversification	Ensure the provision of on-farm incomes (ensuring that small-scale farmers have greater financial independence and value addition opportunities while enabling them to respond to demand from consumers)

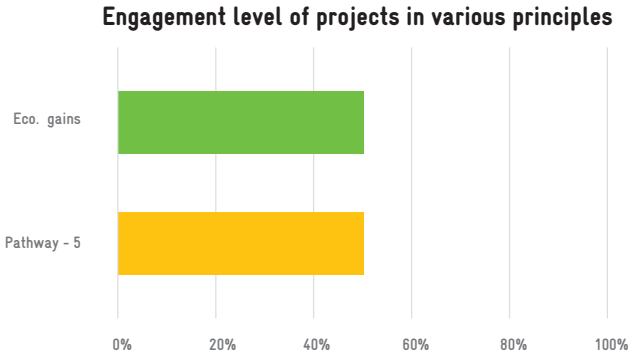
Pathway Coverage

Projects covered	State covered	Partner Covered
5/10	12/16	4/6

Pathway Status

As per principles:

This pathway was made up of 1 principle and 1 activity which was covered by 5 out of 10 projects in 12 out of 16 states in joint collaboration with 4 out of 6 political partners. The projects incorporating this pathway were SuATI, ERADA, SAFAL, DPP Spices and GIC-India.



As per activities:

All projects were requested to mention the status of engagement in various activities aligned to the principles and pathways. The projects identified each activity as either under planning (P) or ongoing (O) or completed (C). The shaded table below show the status against each activity and project while presenting an overall cluster level snapshot.

Principal	Activity	SuATI	SENU	OHA	ERA DA	NE RAQ	SAFAL	DPP Spices	Pro Soil	FES	GIC-India
Economic diversification	Ensure the provision of on-farm incomes (ensuring that small-scale farmers have greater financial independence and value addition opportunities while enabling them to respond to demand from consumers)	P			O		O	O			P

P Planned, O Ongoing, C Completed

Potential Synergies

Unless the cluster ensures a broader outlook among all its projects encompassing various components under the landscape approach, it will not be easy for the projects to walk along this pathway. Learnings from projects like ERADA (Enhancing Rural Resilience through Appropriate Development Actions) may be considered while designing or reorienting projects under this cluster.

Pathway-6: Food Consumption

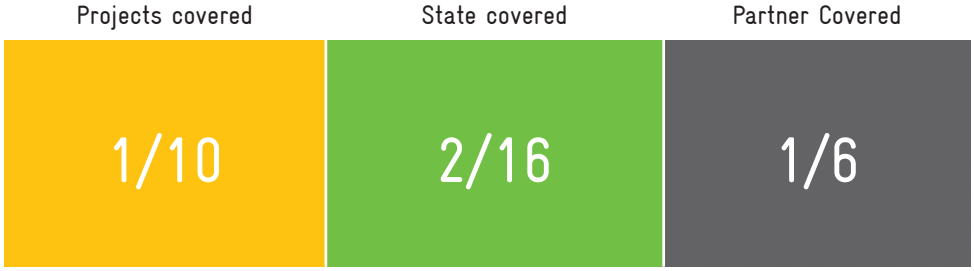
Pathway Definition

If the **consumer behaviour** positively reacts to the more sustainable and nutritious food supply, **diets** will be improved in quality, quantity, diversity, safety and adequacy – either directly through the consumption of own production or indirectly through savings from less external input or incomes that are generated in the food supply chain or through economic diversification.

Pathway Structure

Principle	Activity
Consumer behaviour	Sensitize the consumers in choosing where, how and what food to acquire, prepare, cook, store and eat
	Create awareness of the impact of the choices
Diets	Ensure quantity (adequate food energy, sufficient macro- and micronutrients)
	Ensure quality (macro- and micronutrients; absence of unspecified or unhealthy additives, e.g., trans fats, and of "anti-nutrients" or components within foods that interfere with the absorption of key nutrients, e.g., phytates)
	Ensure diversity (variety of nutrient-dense foods from basic food groupings, incl. vegetables, fruits, whole grains and cereals, dairy foods and animal- and plant-based protein foods)
	Ensure safety (safe to consume, no contamination)
	Ensure healthy, diversified, seasonally and culturally appropriate food
Promotion, Information, guidelines and advertising	Promote healthier food options
	Strengthen regulations for advertising and marketing
	Increase transparency of information on labels

Pathway Coverage

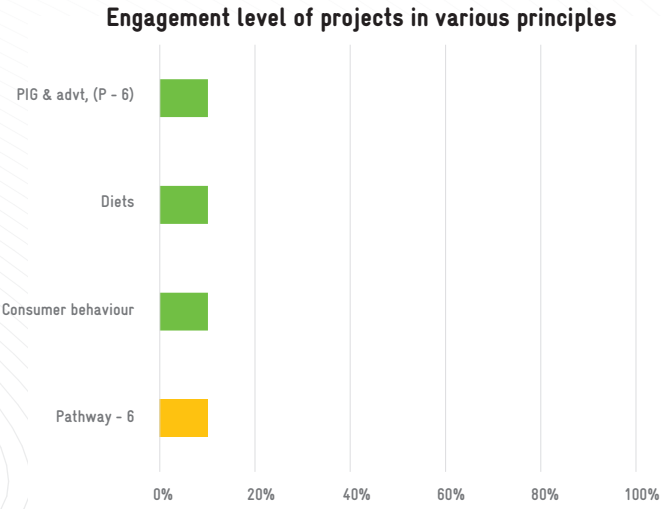


Pathway Status

As per principles:

This pathway was built on 3 principles and 10 activities, and was covered by 1 out of 10 projects, in 2 out of 16 states engaging 1 out of 6 political partners. Only project SENU reported a focus on this pathway covering 2 states (Madhya Pradesh and Maharashtra) in collaboration with the Ministry of Women and Child Development.

Nine (9) out of 10 projects had no focus on the principles and activities of this pathway. At an activity level, except promotion and advertisement, the other two activities consumer behaviour and diets were not a focus of the project covering this pathway.



As per activities:

All projects were requested to mention the status of engagement in various activities aligned to the principles and pathways. The projects identified each activity as either under planning (P) or ongoing (O) or completed (C). The shaded table below show the status against each activity and project while presenting an overall cluster level snapshot.

Principal	Activity	SuATI	SENU	OHA	ERA DA	NE RAQ	SAFAL	DPP Spices	Pro Soil	FES	GIC-India
Consumer behaviour	Sensitize the consumers in choosing where, how and what food to acquire, prepare, cook, store and eat		O								
	Create awareness of the impact of the choices		O								
Diets	Ensure quantity (adequate food energy, sufficient macro- and micronutrients)		O								
	Ensure quality (macro- and micronutrients; absence of unspecified or unhealthy additives, e.g., trans fats, and of "anti-nutrients" or components within foods that interfere with the absorption of key nutrients, e.g., phytates)		O								
	Ensure diversity (variety of nutrient-dense foods from basic food groupings, incl. vegetables, fruits, whole grains and cereals, dairy foods and animal- and plant-based protein foods)		O								
	Ensure safety (safe to consume, no contamination)		P								
	Ensure healthy, diversified, seasonally and culturally appropriate food		O								
Promotion, Information, guidelines and advertising (P-6)	Promote healthier food options		O								
	Strengthen regulations for advertising and marketing										
	Increase transparency of information on labels										

P Planned, O Ongoing, C Completed

Potential Synergies

Consumer focused interventions may be a point of deliberations within the cluster. It may be useful for the cluster to reflect on learnings from SENU (Securing Nutrition, Enhancing Resilience) to guide other projects to evolve from production systems centric approach to FST (food systems transformation) approach. To begin with, projects with deep engagement with pathways 1 and 2 may be encouraged to adapt and adopt learnings from SENU.

Pathway-7: Nutrition and Health

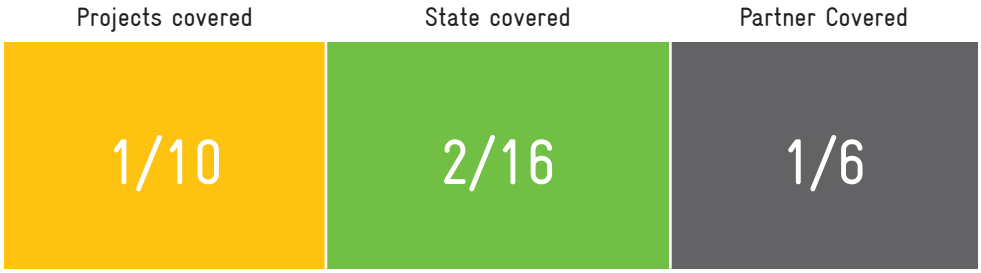
Pathway Definition

If diets are improved in this way, the **positive nutrition and (diet related) health outcomes** and **broader economic, social and environmental impacts** can be expected.

Pathway Structure

Principle	Activity
Nutrition outcomes	Ensure eliminating under five years of age mortality, stunting, wasting and overweight; adult overweight and obesity; women of reproductive age anaemia; and overall vitamin A deficiency
Health outcomes (diet related)	Ensure controlling diet-related non-communicable diseases (NCDs) such as diabetes, coronary heart disease, cancer and stroke
Broader economic impacts	Reduce influences of agriculture and food production (incl. reduction in food losses and waste) on income, employment, economic growth, poverty
Broader social impacts	Achieve social equity positively impacting vulnerable groups such as those living in poverty, women, children, smallholders, fisher folk, forest dwellers, gatherers, hunters, indigenous people, rural landless, urban jobless
Broader environmental impacts	Reduce influences of diets (and the production of its components) on water, land use, biodiversity, other resources, and climate change

Pathway Coverage



Pathway Status

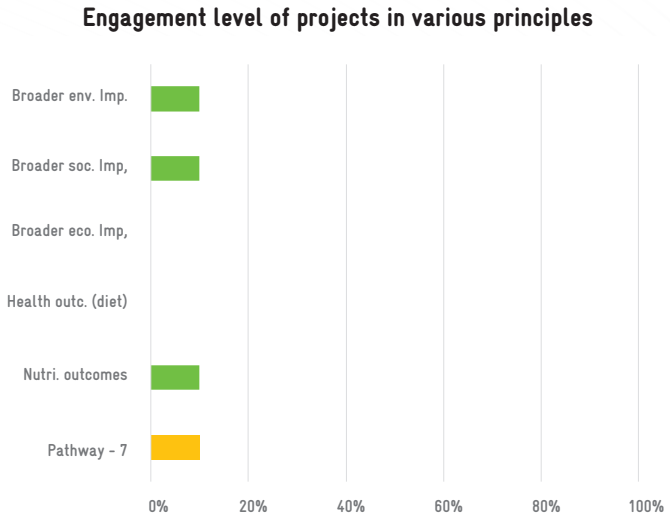
As per principles:

This pathway, comprised of 5 principles and 5 activities, was covered by 1 out of 10 projects, in 2 out of 16 states engaging 1 out of 6 partners. Only project SENU reported having a focus on this pathway.

At the level of both principles and activities, this pathway was of low priority among the projects.

As per activities:

All projects were requested to mention the status of engagement in various activities aligned to the principles and pathways. The projects identified each activity as either under planning (P) or ongoing (O) or completed (C). The shaded table below shows the status against each activity and project while presenting an overall cluster level snapshot.



Principle	Activity	SuATI	SENU	OHA	ERA DA	NE RAQ	SAFAL	DPP Spices	Pro Soil	FES	GIC-India
Nutrition outcomes	Ensure eliminating under five years of age mortality, stunting, wasting and overweight; adult overweight and obesity; women of reproductive age anaemia; and overall vitamin A deficiency		O								
Health outcomes (diet related)	Ensure controlling diet-related non-communicable diseases (NCDs) such as diabetes, coronary heart disease, cancer and stroke										
Broader economic impacts	Reduce influences of agriculture and food production (incl. reduction in food losses and waste) on income, employment, economic growth, poverty										
Broader social impacts	Achieve social equity positively impacting vulnerable groups such as those living in poverty, women, children, smallholders, fisher folk, forest dwellers, gatherers, hunters, indigenous people, rural landless, urban jobless		O								
Broader environmental impacts	Reduce influences of diets (and the production of its components) on water, land use, biodiversity, other resources, and climate change		O								

P Planned, O Ongoing, C Completed

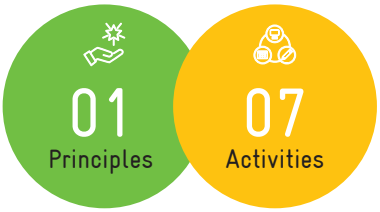
Potential Synergies

Since all the projects were stated to be working with marginalised and poorer segments, the scope to include nutrition as a component under the projects was high. The cluster may consider the learnings from SENU to enrich and evolve its other projects to promote nutrition and health. However, lack of engagement by SENU on two principles namely broader economic impact and health outcomes may limit the synergistic impact in this case.

Pathway-8: Policy and Governance

Pathway Definition

If appropriate **policy and governance**, taking these agroecological principles and food systems dimensions into account, is ensured, then the chances for agroecological transformation of food systems to become a success are much higher than without such a favourable political environment.



Pathway Structure

Principle	Activity
Policy and governance	Ensure land and natural resource governance for agroecological transformation
	Ensure land and natural resource governance for food systems transformation
	Ensure land and natural resource governance for nutrition outcomes
	Ensure land and natural resource governance for (diet related) health outcomes
	Ensure land and natural resource governance for economic impacts
	Ensure land and natural resource governance for social impacts
	Ensure land and natural resource governance- for environmental impacts

Pathway Coverage

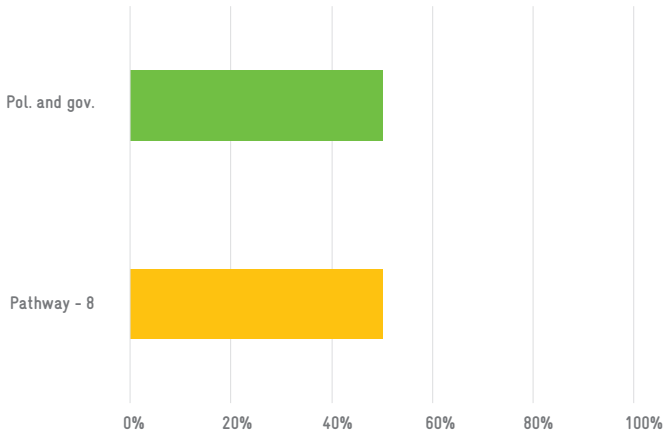
Pathway Status

As per principles:

This pathway was comprised on 1 principle and 7 activities, and covered by 5 out of 10 projects, in 10 out of 16 states working jointly with 4 out of 6 partners. The projects incorporating this pathway included SuATI, OHA, NERAQ, ProSoil and FES.

At the activity level, out of 7 activities, four (4) had less than 40% participation and two (2) activities reported more than 80% participation.

Engagement level of projects in various principles



As per activities:

All projects were requested to mention the status of engagement in various activities aligned to the principles and pathways. The projects identified each activity as either under planning (P) or ongoing (O) or completed (C). The shaded table below show the status against each activity and project while presenting an overall cluster level snapshot.

Principal	Activity	SuATI	SENU	OHA[13]	ERA DA	NE RAQ	SAFAL	DPP Spices	Pro Soil	FES	GIC-India
Policy and governance	Ensure land and natural resource governance for agroecological transformation	P		P		O			O	O	
	Ensure land and natural resource governance for food systems transformation	P							O	O	
	Ensure land and natural resource governance for nutrition outcomes									O	
	Ensure land and natural resource governance for (diet related) health outcomes			P						O	
	Ensure land and natural resource governance for economic impacts									O	
	Ensure land and natural resource governance for social impacts					O				O	
	Ensure land and natural resource governance- for environmental impacts			P		O			O	O	

P Planned, O Ongoing, C Completed

Potential Synergies

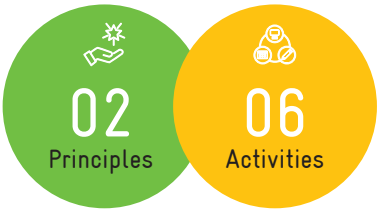
To strengthen coverage and activities related to this pathway, the cluster may consider creating a dedicated mechanism for collating and consolidating learnings from projects, pertaining to collaborating with political partners for policy and governance related interventions, beyond the ambit of each project separately.

13 All the details mentioned in this table for the OHA Project haven't been decided yet by the nodal ministry.

Pathway-9: Support Systems – Agroecology Adoption

Pathway Definition

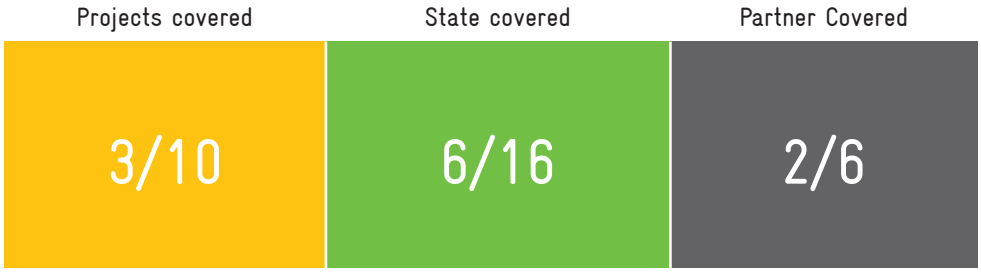
If other **systems supporting food production/the food supply chains**, e.g., economic systems (including agriculture and agribusiness) and energy systems, also apply the 13 principles of agroecology, then the transformative effects on food systems will even be stronger.



Pathway Structure

Principle	Activity
Systems supporting food production/food supply chains	Ecosystem support
	Economic system support: agriculture
	Economic system support: agribusiness
	Energy system support
	Others (if relevant): human system, health system
13 principles of agroecology (as relevant)	See above and below (all other pathways)

Pathway Coverage

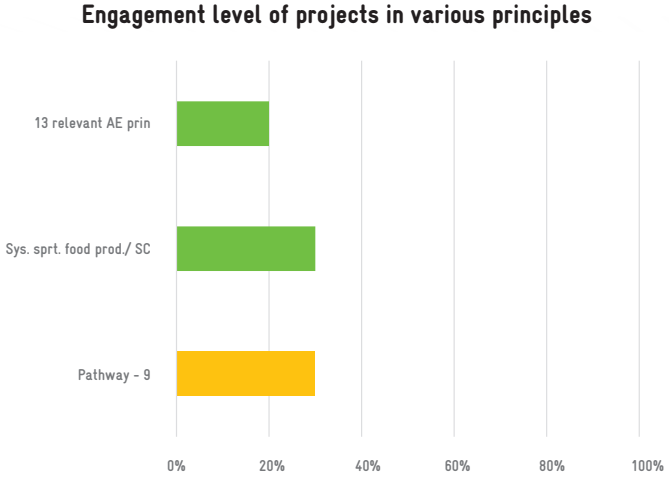


Pathway Status

As per principles:

This pathway was comprised of 2 principles and 6 activities, and covered by 3 out of 10 projects, in 6 out of 16 states engaging 2 out of 6 political partners. The projects focusing on this pathway were OHA, ERADA and FES.

At the activity level, while all the three projects had systems supporting FP & FSC, however only one project was found to be committed fully at the activity level, and the remaining three had only partial commitment.



As per activities:

All projects were requested to mention the status of engagement in various activities aligned to the principles and pathways. The projects identified each activity as either under planning (P) or ongoing (O) or completed (C). The shaded table below show the status against each activity and project while presenting an overall cluster level snapshot.

Principle	Activity	SuATI	SENU	OHA	ERA DA	NE RAQ	SAFAL	DPP Spices	Pro Soil	FES	GIC-India
Systems supporting food production/food supply chains	Ecosystem support			P	P					O	
	Economic system support: agriculture			P						O	
	Economic system support: agribusiness				O					O	
	Energy system support				O						
	Others (if relevant): human system, health system			P						O	
13 principles of agroecology (as relevant)	See above and below (all other pathways)			P						O	

P Planned, O Ongoing, C Completed

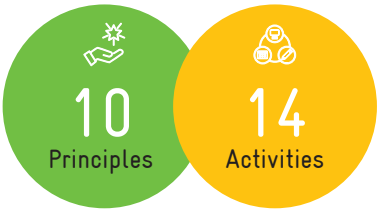
Potential Synergies

The cluster may deliberate on establishing a working mechanism to bring together the systemic focus of its political partners based on the potential of its projects to collaborate among themselves focusing on multi-sectoral engagements.

To enhance agroecology adoption, all projects under 'the Cluster' may consider incorporating activities for promoting the concept of agroecology and food systems with their respective political partners by learning from the experiences of ERADA and FES.

Pathway-10: Inclusive Growth

Pathway Definition



If these key elements of the 'WHAT' are realised in such a way (the 'HOW') that gender sensitivity, inclusiveness, do-no-harm, ***co-creation*** and sharing ***of knowledge*** and innovations, ***social values*** of local communities and provision of healthy, diversified, seasonally and culturally appropriate ***diets*** (see pathway 6), ***fairness*** (see pathway 1), ***connectivity*** (see pathway 1), strengthened social organization and ***participation*** in decision-making by food producers and consumers prevail, then the pathway to sustainable food systems is paved.

Pathway Structure

Principle	Activity
Gender Sensitivity	Work on needs, rights, division of labour, power relations, and (in)equalities of women/girls and men/boys are (i) taken into consideration and (ii) gaps addressed
Inclusiveness	Participation of all population groups, esp. vulnerable and often neglected groups, in processes, decision-making and benefits
Do-no-harms	Understood unintended consequences of the project on the relationships between groups of people in the given context are (i) taken into consideration, and (ii) addressed
Co-creation of knowledge	Co-creation and horizontal sharing of knowledge, including local and scientific innovation, especially through farmer-to-farmer exchange
Social values	Ensure that the food systems are based on the culture, identity, tradition, social and gender equity of local communities
Diets (healthy, diversified, seasonally and culturally appropriate)	Ensure quantity (adequate food energy, sufficient macro- and micronutrients)
	Ensure quality (macro- and micronutrients; absence of unspecified or unhealthy additives, e.g., trans fats, and of "anti-nutrients" or components within foods that interfere with the absorption of key nutrients, e.g., phytates)
	Ensure diversity (variety of nutrient-dense foods from basic food groupings, incl. vegetables, fruits, whole grains and cereals, dairy foods and animal- and plant-based protein foods)
	Ensure safety (safe to consume, no contamination)
	Ensure healthy, diversified, seasonally and culturally appropriate food
Acceptability (P- 10)	Ensure that People's attitudes about attributes of their local food environment and whether the given supply of products meets their personal standards; can be influenced through promotion, information, guidelines, and advertising (see next point)
Fairness (P- 10)	Focus on dignified and robust livelihoods for all actors engaged in food systems, especially small-scale food producers, based on fair trade, fair employment and fair treatment of intellectual property rights
Connectivity (P- 10)	Ensure proximity and confidence between producers and consumers through promotion of fair and short distribution networks and by re-embedding food systems into local economies
Participation	Ensure social organization and greater participation in decision-making by food producers and consumers to support decentralized governance and local adaptive management of agricultural and food systems

Pathway Coverage

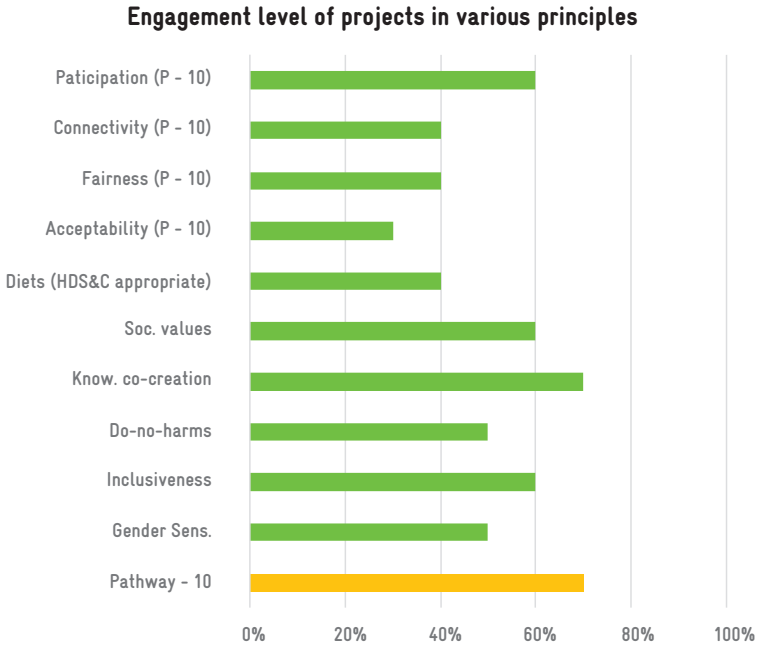
Pathway Status

As per principles:

This pathway was comprised of 10 principles and 14 activities which were covered by 7 out of 10 projects in 12 out of 6 states working jointly with 5 out of 6 political partners. The projects walking along this pathway included SuATI, SENU, ERADA, NERAQ, ProSoil, FES and GIC-India.

At the level of principles, acceptability was found to be least addressed. Connectivity, fairness, diets (HDS&CA-healthy, diversified, seasonally and culturally appropriate) had lower coverage by the projects under this pathway. However, knowledge co-creation had 100% coverage.

At the activities level, HDS&CA had five (5) activities of which none of the activities had more than 60% of the projects participating in it. Out of this 60%, two (2) activities had less than 30% participation.



As per activities:

All projects were requested to mention the status of engagement in various activities aligned to the principles and pathways. The projects identified each activity as either under planning (P) or ongoing (O) or completed (C). The shaded table below show the status against each activity and project while presenting an overall cluster level snapshot.

Principle	Activity	SuATI	SENU	OHA	ERA DA	NE RAQ	SAFAL	DPP Spices	Pro Soil	FES	GIC-India
Gender Sensitivity	Work on needs, rights, division of labour, power relations, and (in)equalities of women/girls and men/boys are (i) taken into consideration and (ii) gaps addressed	P	O		O				O	P	
Inclusiveness	Participation of all population groups, esp. vulnerable and often neglected groups, in processes, decision-making and benefits	P	O		O	O			O	O	
Do-no-harms	Understood unintended consequences of the project on the relationships between groups of people in the given context are (i) taken into consideration, and (ii) addressed	P	O			O			O	O	
Co-creation of knowledges	Co-creation and horizontal sharing of knowledge, including local and scientific innovation, especially through farmer-to-farmer exchange	P	O		P	O			C	O	O
Social values	Ensure that the food systems are based on the culture, identity, tradition, social and gender equity of local communities	P	O		P	O			O	O	

Principle	Activity	SuATI	SENU	OHA	ERA DA	NE RAQ	SAFAL	DPP Spices	Pro Soil	FES	GIC-India
Diets (healthy, diversified, seasonally and culturally appropriate)	Ensure quantity (adequate food energy, sufficient macro- and micronutrients)		O			P				O	
	Ensure quality (macro- and micronutrients; absence of unspecified or unhealthy additives, e.g., trans fats, and of "anti-nutrients" or components within foods that interfere with the absorption of key nutrients, e.g., phytates)		O							O	
	Ensure diversity (variety of nutrient-dense foods from basic food groupings, incl. vegetables, fruits, whole grains and cereals, dairy foods and animal- and plant-based protein foods)	P	O							O	
	Ensure safety (safe to consume, no contamination)	P								P	
	Ensure healthy, diversified, seasonally and culturally appropriate food	P	O			O				P	
Acceptability (P-10)	Ensure that People's attitudes about attributes of their local food environment and whether the given supply of products meets their personal standards; can be influenced through promotion, information, guidelines, and advertising (see next point)	P	O		P						
Fairness (P-10)	Focus on dignified and robust livelihoods for all actors engaged in food systems, especially small-scale food producers, based on fair trade, fair employment and fair treatment of intellectual property rights	P	O		P					P	
Connectivity (P-10)	Ensure proximity and confidence between producers and consumers through promotion of fair and short distribution networks and by re-embedding food systems into local economies	P	O		P					P	
Participation (P-10)	Ensure social organization and greater participation in decision-making by food producers and consumers to support decentralized governance and local adaptive management of agricultural and food systems	P	O		P	P			O	P	

P Planned, O Ongoing, C Completed

Potential Synergies

The cluster may reflect on finding ways to motivate and guide its projects to enhance their engagement across the principles of this pathway before looking for synergistic opportunities. Learnings from SENU, ERADA and FES may be collated and presented to other projects thus helping them identify the possibilities of increasing the levels of engagement for principles having low engagement within the projects of the cluster.

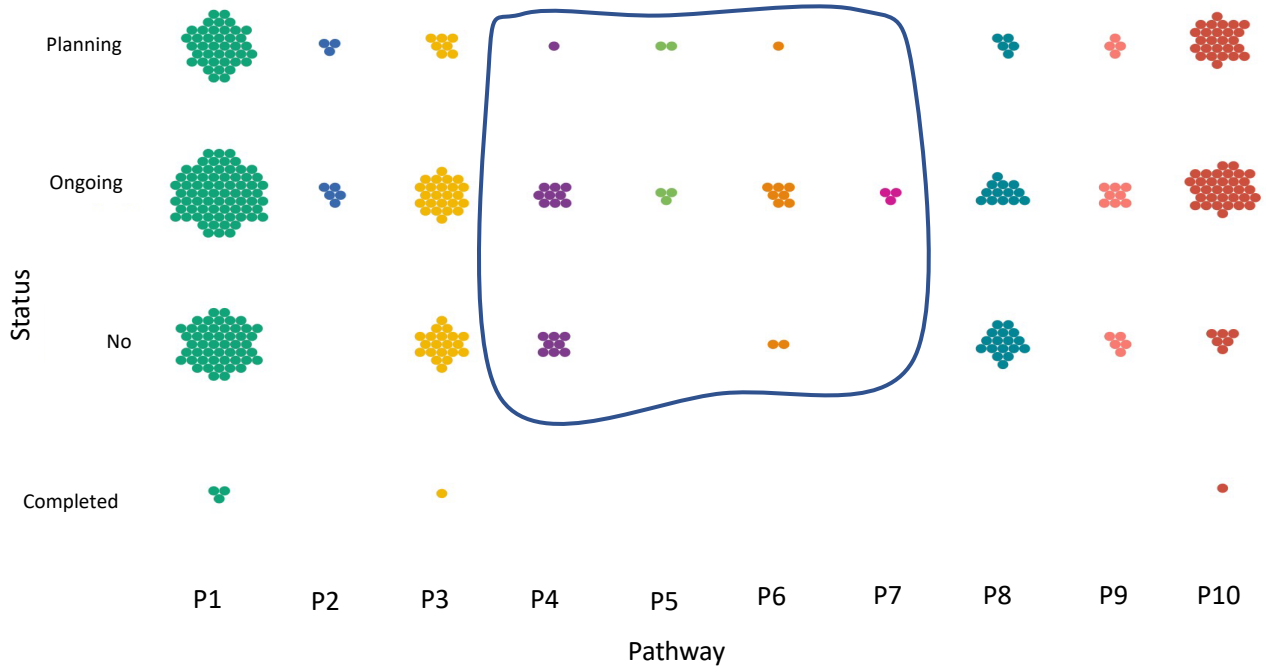
4.3 Pathways and Activities

This section presents the distribution of activities across pathways and their stage of completion within the project, with the purpose of generating discussion and action within 'the Cluster' for consolidating, accelerating and diversifying activities to build robust pathways for agroecology-based food systems transformation.

Distribution and Maturity of Activities

At the level of activities, mapping to ascertain the status of the projects, revealed that within the projects which participated in this Cluster Portfolio Analysis, very few activities were completed so far. ProSoil project has ensured few activities reached the stage of completion. There has been a strong coverage of Pathway 1. The coverage of activities under PW 4, 5, 6 and 7 have remained suboptimal.

Pathways and distribution of activities



Activities Having No Evidence in the Cluster

Significantly, this may be an agenda for deliberation within 'the Cluster', some activities had no evidence in 'the Cluster'. These are related to pathways 3, 6 and 7, and these are presented in table 4 overleaf.

TABLE 4: Activities that were not reported within the Cluster

Pathway 3 – Food Supply Chain	• Facilitated, as appropriate, the use of food fortification in traditional and mixed food systems. • Encouraged supermarkets to procure "healthier" foods in mixed and modern food systems. • Addressed food deserts and food swamps in mixed and modern food systems. • Encouraged healthier diets through public procurement of foods. • Promoted healthier diets through discriminatory trade policies. • Encouraged healthier diets through taxes and subsidies. • Strengthened regulations for advertising and marketing.
Pathway 6 – Food Consumption Behaviour	• Strengthened regulations for advertising and marketing. • Increased transparency of information on labels.
Pathway 7 – Nutrition and Health	• Ensured controlling diet-related non-communicable diseases (NCDs) such as diabetes, coronary heart disease, cancer and stroke • Reduced Influences of agriculture and food production (incl. reduction in food losses and waste) on income, employment, economic growth, poverty.

5 Takeaways

5.1 Emerging Cluster Narrative

At the Cluster level, while the overall coverage of most pathways was satisfactory, data analysis suggested that coverage at the level of activities across all pathways seemed sub optimal and there may be a high likelihood for identifying opportunities for increasing the coverage of principles and activities within each pathway. In a nutshell, with respect to building the cluster narrative for promoting food systems transformation based on agroecology principles, the positive indications were:

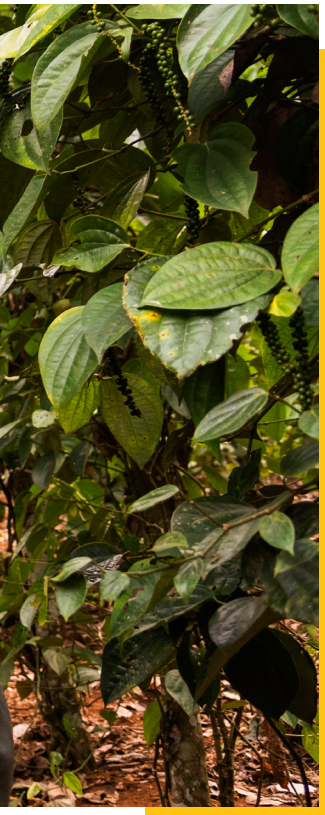
i. The cluster reported a strong focus on building stronger production systems along Agroecological principles.

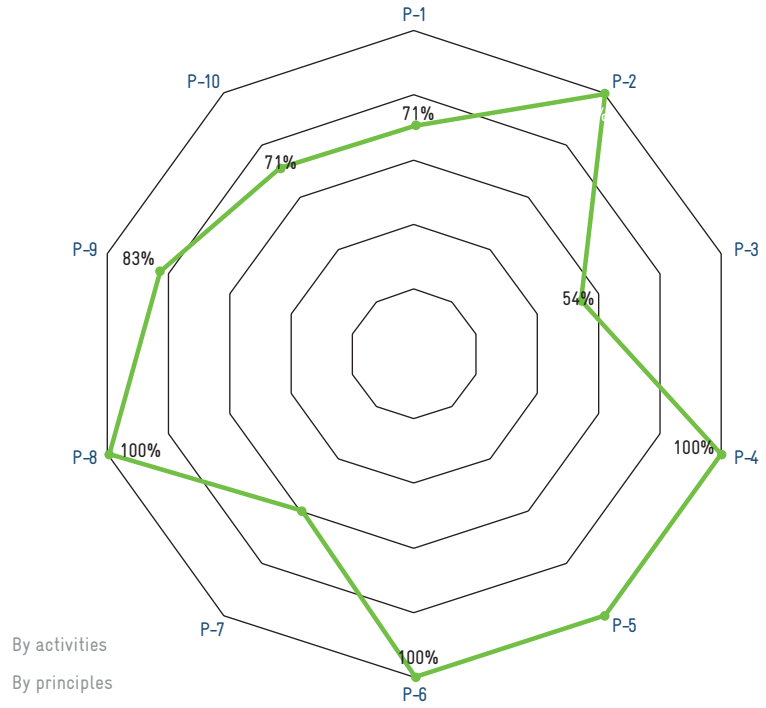
ii. A deep focus on pathway 2 (Agroecosystems' synergy) was reported.

iii. Government being a significant partner, pathway 8 (Policy and Governance) was well developed within 'the Cluster'.

iv. Due to strong working relation with CSOs, pathway 10 (Inclusive growth) has been a major focus for 'the Cluster', and

v. Pathway 3 (Food supply chain) was an important part of projects focused on value chain development.





Further deliberations may be undertaken by 'the Cluster' for:

i. Increasing the coverage of pathways 4 & 5 (Economic gain and Economic diversification respectively) which was reported as a focus by only 50% of the projects.

ii. Enhancing the focus on Pathway 7 (Nutrition and Health), as currently only 1 project, SENU is focusing on it

iii. Strengthening activities for 'connecting consumers'.

iv. Deepening focus on building Pathway 9 (AE Adoption Support Systems) that entails collaborating with diverse set of stakeholders.

5.2 Potential Synergies

In exploring potential intra and inter cluster synergies, 'the Cluster', GIZ's Core Group anchoring FST integration may lead the process of reflection, rethinking and redesign at three below mentioned levels. In addition, the Core Group may also deliberate on the development of an FS/AE index for measuring progress towards achieving Food Systems Transformation of each of their projects in India. The tool should be shared with other stakeholders working on AE-FST space for measuring the progress.

At Project Level

Synergy may be explored by three types of projects which are a) System focused, b) Component focused and c) Value chain focused.

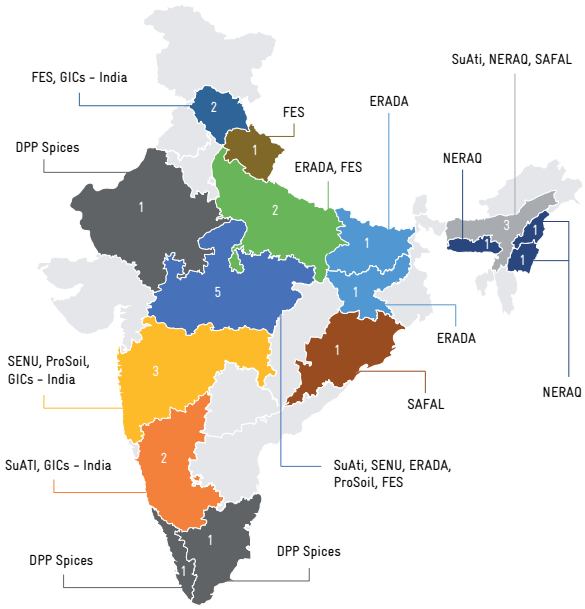
TABLE 5: Opportunities for exploring project level synergy

System Focused	Component Focused	Value Chain Focused
SuATI: Agroecology based transformation	ERADA: Livelihoods (diversification & alternatives)	SAFAL: Sustainable aquaculture – Fish value chain
SENU: Nutrition and diet	NERAQ: Aquatic Ecosystem Conservation	DPP Spice: Spices (Sustainable farming)
OHA: Institutions	ProSoil: Soil (protection and rehabilitation)	GIC – India: Potato, Tomato, Apple (Agri-innovations)
	FES: Water (Forest Ecosystems Approach)	

- At cluster level, a consultative mechanism may be established to identify the opportunities of learning and resource sharing among projects based on similarities of geography, nature of beneficiaries, partners and implementation architecture.
- This consultative mechanism may facilitate the design and revisions (if any) undertaken by projects to ensure that the Food System Transformation mandate is addressed through an AE centric engagement at the project level.

At State level

- Madhya Pradesh (MP), Maharashtra, Assam have more than 3 projects and offer opportunities to work in a comprehensive manner to address various aspects of AE & FS.
- MP, which has 5 projects, may be taken up as a model state to detail out potential areas for building synergies among projects and states.
- The states with single projects may be prioritized for additional interventions keeping in view the possibilities for synergistic implementation.
- Some projects may be motivated to look through a regional approach to encompass adjacent states to achieve greater impact through synergies with existing projects.



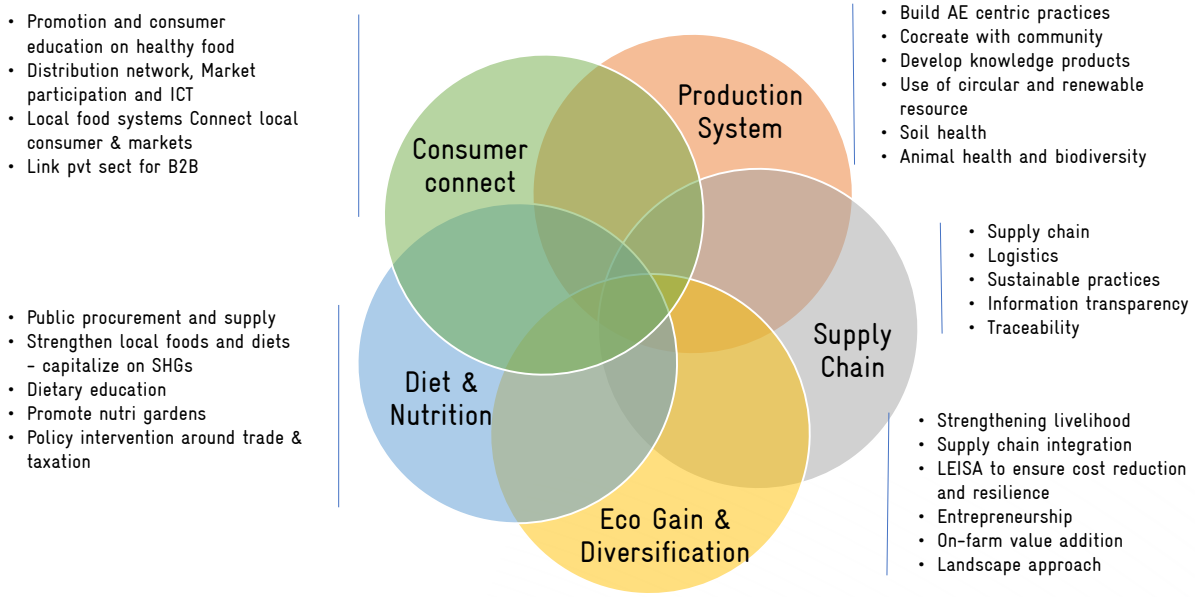
At Programmatic Level

In order to build a strong focus on Food Systems the cluster may prioritize five (5) core areas as captured below:

- **Production system:** Co-create with community to create a fusion of indigenous knowledge with sustainable modern technologies, for implementing practices aimed at improving soil health and increased use of circular and renewable resources.
- **Supply Chain:** Develop sustainable practices for enhancing transparency and traceability in the food supply chain.
- **Economic gains and diversification:** Adopting a landscape approach for strengthening livelihoods by increasing profitability and resilience of production systems and promoting entrepreneurship.
- **Diet and Nutrition:** Increasing access of producers to nutritious locally grown and procured foods
- **Consumers connect:** Enhancing consumer awareness regarding healthy food and promoting Business to Business (B2B) linkages among private players.

The same has been captured in the diagram below.

Potential synergies at the level of programmatic domains



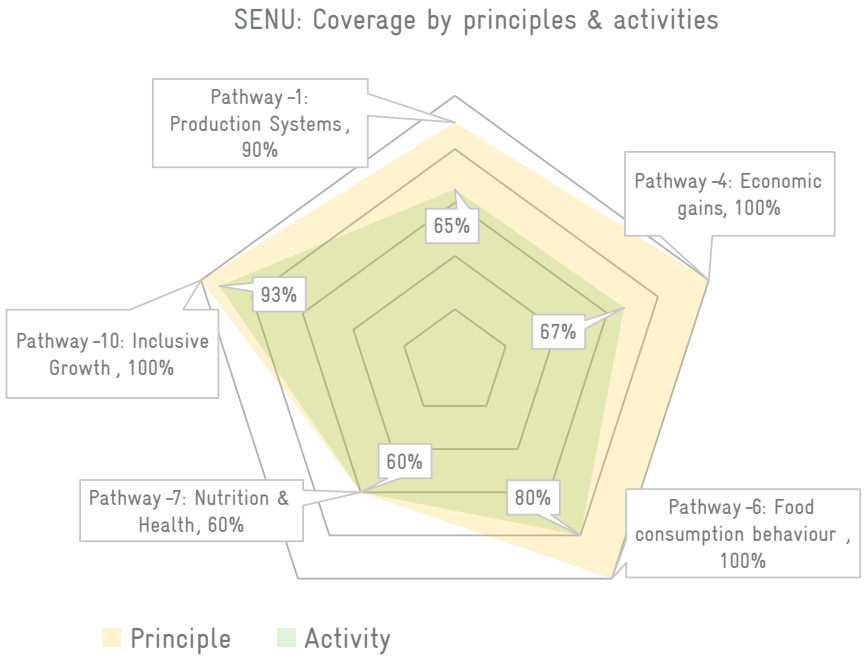
6 Evolved Initiatives

6.1 SENU[14]: An Emerging Case for FST

In order to improve year-round availability and access to diverse and nutritious foods and also economically empower women with the confluence of agroecology, nutrition, livelihood, and women empowerment in being synergistic and mutually beneficial approach, SENU project implements 350 Community Nutrition Gardens (CNGs) in Madhya Pradesh through implementation partners and in collaboration with MGNREGA, 18 CNGs per block. The Community Nutrition Gardens are generally established over one (1) hectare of land. Since the focus is on improving nutritional security among rural households, fruit trees and vegetables are being majorly grown in the CNGs. The project has converged with the government and Gram panchayats to provide the government and community common lands on lease to the SHG/ Cluster Level Federation (CLF) for establishing CNGs. CNGs are nurtured by women from SHGs, trained in crop planning, manufacturing bio-inputs, managing soil health, and intercultural operations. The SHG women distribute the work among themselves and allocate their personal time to maintain the gardens. Additionally, the project has also created convergence with MGNREGA, to provide wages to women for garden maintenance and monetary incentives to take care of the plants.

14 https://snrd-asia.org/securing-nutrition-enhancing-resilience-india/

Under the intervention, the focus is also on creating awareness among rural households regarding the importance of dietary diversity. The project has collaborated with the Anganwadi Workers (AWW) to provide nutrition and hygiene education to SHG members. The project understood that only providing education and creating awareness would not solve the issues of malnutrition and it would be necessary to provide the households with access to nutritious food items. With the aforementioned objectives, CNGs are being established under the aegis of SENU. Upon harvesting the produce from the nutrition gardens, the SHG women distribute the produce among themselves and in some cases, also supply to the local schools and other households at market rates. The CNGs have not only helped in improving the nutritional status among the SHG women but also, allowed them to make extra income through their efforts.



These CNGs also act as demo plots to disseminate training to other farmers and SHGs on better agricultural practices as well as on enhancing dietary diversity. Based on the learnings from this pilot, GIZ has influenced the Government of Madhya Pradesh and State Rural Livelihoods Mission (SRLM) to include Community Nutrition Gardens (CNGs) into their development programs.

The SENU project is uniquely placed in terms of addressing nutritional needs of marginalized communities - a core element of food systems. Top five (5) pathways SENU focuses on are Production System, Economic Gain, Diet and Nutrition, Consumer Behaviour and Inclusive Growth.

SENU champions a gender inclusive approach for nutritional security. Community nutrition gardens are managed by women owned SHGs ensuring the principle of fairness. The project promotes economic diversification by promoting additional livelihood sources among the project communities and also, building resilience. SENU builds on social values and diets by promoting local and diversified foods among the farming households. The project establishes demo plots for knowledge dissemination and building capacities of community resources persons to provide training through co-creation of knowledge, convergence and dialogue with PRIs and Government departments for setting up community nutrition gardens on common lands.

SENU has prioritised interventions around the following 5 Pathways. Namely - Production Systems (PW1), Economic gains (PW4), Food consumption behaviour (PW6), Nutrition & Health (PW7) and Inclusive Growth (PW10).

Pathway	Principles covered	Activities covered
Production Systems (PW1),	9/10	13/20
Economic gains (PW4),	1/1	2/3
Food consumption behaviour (PW6	3/3	8/10
Nutrition & Health (PW7	3/4	3/5
Inclusive Growth (PW10)	10/10	13/14

At the level of Pathways SENU has a greater coverage. SENU offers unique opportunity to other projects to deep dive into Pathway 6 and 7 which are around consumer behaviour and nutrition and health. Activities under these pathways may help other projects in the cluster to adopt.

However, at the activity level SENU has few key areas to demonstrate under Pathway 1. While it is a unique initiative having a focus on PW 6 and 7, SENU still needs to focus more on the same. Some of the core areas SENU may introduce its activities to emerge more stronger are given below.

Pathway	Principles	Activities
Production Systems (PW1)	Animal health	No activity has been undertaken under the Animal health
	Production systems	1/2 of the identified activities have been undertaken and rest are not covered
	Availability of food'	1/3 of the identified activities have been undertaken and rest are not covered
Economic gains (PW4)		Activities around reinvesting in food supply chain and saving on external inputs to achieve economic gains for the farmers and business actors was not undertaken=
Food consumption behaviour (PW6)	Promotion, Information, guidelines and advertising'	1/3 of the identified activities undertaken rest are not covered; Activities around 'strengthening regulations for advertising and marketing', and 'increasing transparency of information on labels' were not undertaken
Nutrition & Health (PW7)		Activities under 'Health outcomes (diet related)' and 'Broader economic impacts' dimensions were not covered
Inclusive Growth (PW10)		'Diets (healthy, diversified, seasonally and culturally appropriate)' – Activity related to ensuring food safety (safe to consume, no contamination) were not undertaken

SENU project has mostly covered the various activities under the principles under focus. Activities missed out are mostly of relevant to niche settings and is not likely to be relevant to most project settings. Market and supply chain centric activities could have been brought more under focus. The project has the potential to strengthen the FS model by leveraging core strengths of other projects like SuATI, ProSOIL and ERADA, to name a few.

Potential for synergies: Other projects may learn from SENU for building an AE based approach to promote nutrition gardens and involving community in planning, execution and knowledge dissemination.

6.2 ProSoil: An Emerging Case for FST

The project "Soil protection and rehabilitation of degraded soil for food security in India (ProSoil)" is being implemented by Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH on behalf of German Federal Ministry for Economic Cooperation and Development (BMZ) in partnership with National Bank for Agriculture and Rural Development (NABARD). The major activities undertaken within the ProSoil project in India.

1. **Competences for soil protection:** Farmers receive soil health cards, are trained in implementing soil protection practices and management of home gardens. Coordinated guidelines for soil protection ensure the sustainability and replicability of measures and create convergence with national programmes.

2. **Digital solutions for sustainable soil management:** The digital consulting system "niceSSM" uses digital-analogue consulting and monitoring instruments related to soil protection through the state agricultural consulting system. It generates professional feedback to farmers and adapts advisory content to local needs.

3. **Closing nutrient cycles to enhance soil fertility**: The Urban-Rural Nutrient and Carbon Cycle (URNCC) initiative establishes sustainable market-oriented approaches and new business models for the use of compost in rural areas and value chains for the recycling of nutrients and carbon from cities.

4. **Landscape and land use planning**: Large-scale planning integrates soil protection and soil fertility management through establishing landscape planning into water catchment areas.

Regions
5 districts in the state of Maharashtra and
2 districts in the state of Madhya Pradesh.

Duration
May 2015 – June 2023

Budget
EUR 22.235.000 EUR

Commissioning party
German Federal Ministry of Economic Cooperation and Development (BMZ)

Implementation partners
National NGOs (WOTR, BAIF and FES)
National and international research: Birla Institute for Technology and Science, Indian Institute for Soil Science, International Crops Research Institute for the Semi-Arid Tropics, International Water Management Institute

Lead executing agency
National Bank for Agriculture and Rural Development (NABARD)

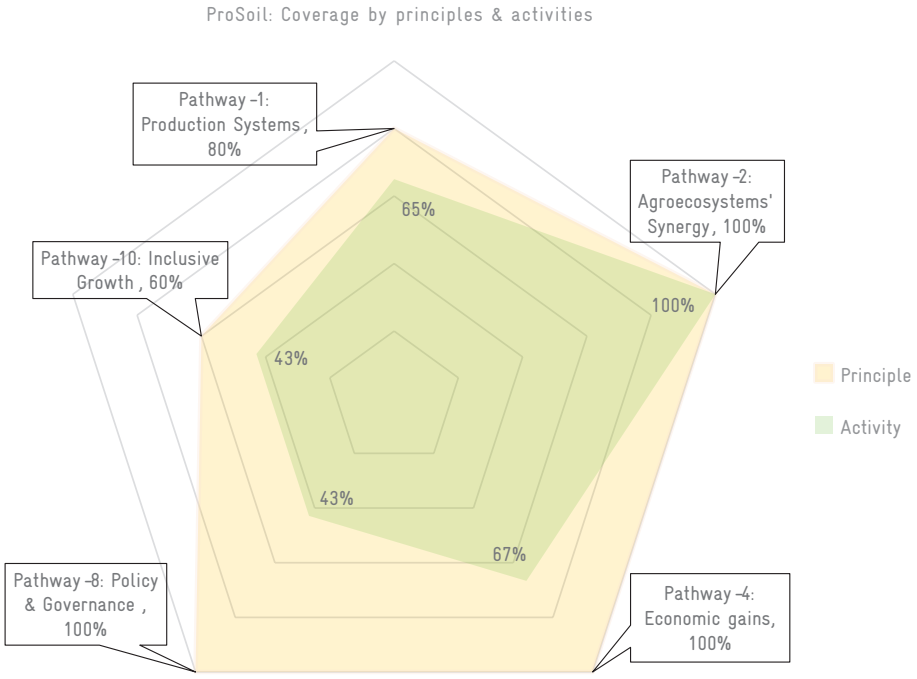
Target group
Smallholder farmers in the two states

Source:- https://www.giz.de/en/downloads/ProSoil_Factsheet_Indien_en_Nov2019.pdf

Pathway	Principles covered	Activities covered
Production Systems (PW1),	8/10	14/20
Agroecosystems' Synergy (PW2)	1/1	1/1
Economic gains (PW4),	1/1	2/3
Policy & Governance (PW8)	1/1	3/7
Inclusive Growth (PW10)	6/10	6/14

ProSoil has prioritised interventions around the following 5 Pathways namely, Production Systems (PW1), Agroecosystems' Synergy (PW2), Economic gains (PW4), Policy & Governance (PW8) and Inclusive Growth (PW10).

Pathway	Principles	Activities
Production Systems (PW1)	Fairness	No activity undertaken
	Availability of food'	No activity undertaken
	Production systems'	of the identified activities have been undertaken rand est are not covered
Economic gains (PW4)	Economic gains	No activity around reinvesting in food supply chain and saving on external inputs to achieve economic gains for the farmers and business actors was not undertaken
Food consumption behaviour (PW6)	Promotion, Information, guidelines and advertising'	of the identified activities undertaken rest are not covered; Activities around 'strengthening regulations for advertising and marketing', and 'increasing transparency of information on labels' were not undertaken
Policy and Governance (PW8)		of the identified activities undertaken rest are not covered; Activities around 'ensuring land and natural resource governance' leading to better nutrition outcomes, health outcomes, and economic and social impacts were not undertaken
Inclusive Growth (PW10)	Diets (healthy, diversified, seasonally and culturally appropriate)	No activity undertaken
	Acceptability	No activity undertaken
	Fairness	No activity undertaken
	Connectivity	No activity undertaken



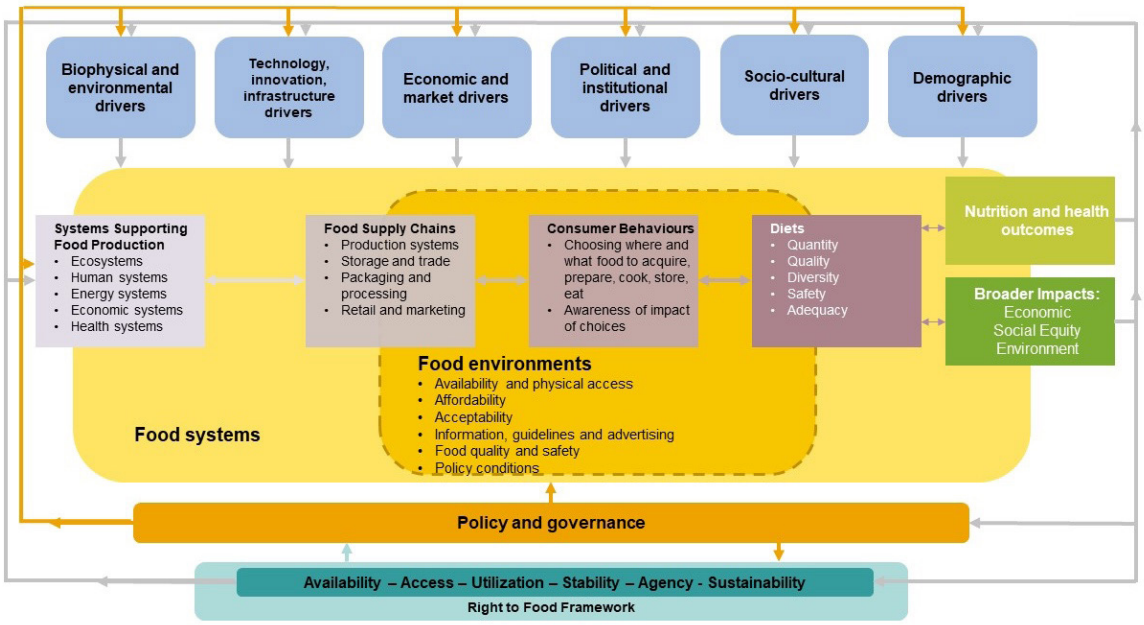
ProSoil project has covered select dimensions and activities under the principles it focussed on. It is one of the few projects to cover 'animal health' dimension. Besides certain niche activities, mainstream activities related to food availability were not under ProSoil's purview. Focus on market and consumer connect were not prioritised under the project and could have been focussed more.

7

Annexures

Annexure 7.1: Sustainable Food Systems Framework and Principles of Agroecology

1. Sustainable Food Systems Framework



2. Thirteen (13) Principles of Agroecology

Principle	Description
1. Recycling	Preferentially use local renewable resources and close as far as possible resource cycles of nutrients and biomass.
2. Input reduction	Reduce or eliminate dependency on purchased/external inputs and increase self-sufficiency.
3. Soil health	Secure and enhance soil health and functioning for improved plant growth, particularly by managing organic matter and enhancing soil biological activity.
4. Animal health	Ensure animal health and welfare.
5. Biodiversity	Maintain and enhance diversity of species, functional diversity and genetic resources and thereby maintain overall agroecosystem biodiversity in time and space at field, farm and landscape scales.
6. Synergy	Enhance positive ecological interaction, synergy, integration and complementarity among the elements of agroecosystems (animals, crops, trees, soil and water).
7. Economic diversification	Diversify on-farm incomes by ensuring that small-scale farmers have greater financial independence and value addition opportunities while enabling them to respond to demand from consumers.
8. Co-creation of knowledge	Enhance co-creation and horizontal sharing of knowledge including local and scientific innovation, especially through farmer-to-farmer exchange.
9. Social values and diets	Build food systems based on the culture, identity, tradition, social and gender equity of local communities that provide healthy, diversified, seasonally and culturally appropriate diets.
10. Fairness	Support dignified and robust livelihoods for all actors engaged in food systems, especially small-scale food producers, based on fair trade, fair employment and fair treatment of intellectual property rights.
11. Connectivity	Ensure proximity and confidence between producers and consumers through promotion of fair and short distribution networks and by re-embedding food systems into local economies.
12. Land and natural resource governance	Strengthen institutional arrangements to improve, including the recognition and support of family farmers, smallholders and peasant food producers as sustainable managers of natural and genetic resources.
13. Participation	Encourage social organization and greater participation in decision-making by food producers and consumers to support decentralized governance and local adaptive management of agricultural and food systems.

Sources: GIZ. 2020 and HLPE. 2019

Annexure 7.2: Detail Description of Ten Projects

PROJECT	DESCRIPTION / OBJECTIVE
SuATI: Support to Agroecological Transformation Processes in India	Objective & Approach: The objective of SuATI is to strengthen agroecological transformation processes of agricultural and food systems at national and state level in India through five interlinked output areas: 1. Improve knowledge on agroecological and similar sustainable agricultural practices: SuATI aims to improve the exchange and coherent application of knowledge on agroecological practices by supporting knowledge platforms and networks on agroecology, developing training modules and capacity building, incl. peer-to-peer approaches, and facilitating national and state-level research partnerships on evidence of agroecological approaches. 2. Support implementation of agroecological programmes with focus on market development, crop and income diversification at state level: SuATI strengthens the implementation of agroecological approaches with a focus on market development, thereby reinforcing a core idea of agroecology – the link between producers and consumers. Support is provided in the identification and upscaling of successful agroecological business models through farmer. organisations, the enhancement of consumer awareness as well as advice to state departments on the agroecological orientation of programmes. 3. Anchor agroecological principles and approaches in national programmes: At national level, SuATI works with the MoA&FW, NABARD and the National Rural Livelihood Mission (NRLM) of MoRD to anchor agroecological principles. in national programmes and support their operationalisation. Focus is placed on cross-sectoral and cross-policy exchanges and the translation of resulting recommendations into action. 4. Demonstrate landscape-based planning, implementation and monitoring of agroecological approaches: In cooperation with NABARD, SuATI supports the strategic and technical requirements for landscape-based planning, implementation and monitoring of agroecological approaches in NRM projects. This includes digital and participatory planning methods for implementation and impact monitoring, capacity enhancement of various target groups and local innovations. 5. Strengthen Indo-German dialogue and cooperation on agroecology: As anchor project for the Indo-German Lighthouse "Agroecology and Sustainable Management of Natural Resources", SuATI supports intersectoral policy and technical dialogues on agroecology to create additional acceptance and stimulate joint initiatives. A flexible funding mechanism allows for rapid and demand-driven responses to opportunities that arise from policy dialogues and multistakeholder processes under the Lighthouse.

PROJECT	DESCRIPTION / OBJECTIVE
SENU: Securing Nutrition, Enhancing Resilience	The Indo-German project 'Securing Nutrition, Enhancing Resilience (SENU) – India' implemented by Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH in collaboration with the Ministry of Women and Child Development (MWCD), Government of India is part of a global programme being implemented in 10 countries including India. The programme is part of the special initiative "Transformation of Agricultural and Food Systems" by the German Federal Ministry for Economic Cooperation and Development (BMZ) and is co-financed by the Bill and Melinda Gates Foundation. The project aims to improve the nutrition situation of 424,000 women of child-bearing age, pregnant and lactating women, and 86,000 young children (6-23 months) from vulnerable communities in the states of Madhya Pradesh and Maharashtra, India. **NUTRITION-SENSITIVE INTEGRATED APPROACH** In six districts (Barwani, Khandwa, Sheopur and Chhatarpur in Madhya Pradesh), the project is implementing a nutrition-sensitive integrated approach linking nutrition education with a multisectoral Community Nutrition Garden initiative and nutrition sensitive micro-planning at community level. In two districts (Washim and Nandurbar districts) of Maharashtra, the project focuses on nutrition education. The project implements a systematic capacity building and training in 10 Utkarsh districts of ICDS frontline workers and adolescent skilling programme to support MWCD´s Mission Poshan 2.0. The project also strengthens nutrition governance through addressing supply chain and demand gaps in government social safety net programs.
OHA: One Health and Agroecology	Objective: Improve the institutional framework for reducing risks to human, animal and environmental health. Objective: The objective of the project is to strengthen the livelihoods of vulnerable households based on locally available natural resources and developmental support programmes.
ERADA: Enhancing Rural Resilience through Appropriate Development Actions	ERADA is operational on a national level and in eight blocks across eight aspirational districts in four Indian states namely Bihar, Jharkhand, Madhya Pradesh and Rajasthan. Approach: The project is strengthening livelihoods for women, youth, migrants and vulnerable communities in rural areas to enhance their income generation opportunities, thus providing them the opportunity to stay back and not migrate out of distress and be better positioned for upcoming pandemics and other crises. The project aims at the long-term, sustainable strengthening of the local natural resource base, through Mahatma Gandhi NREGA. This includes digital and institutional infrastructure measures that improve the natural resource base to be climate change resilient as well as agroecological approaches that make the use of the resource base more resilient, through adapted cultural techniques and varieties. The project will strengthen the convergence of different government support programmes for the conservation and sustainable management of the natural resource base, augmenting sustainable livelihoods and strengthening rural resilience.
NERAQ: Protection and Sustainable Management of Aquatic Resources in the North Eastern Himalayan Region of India	The project is helping to ensure the retention and sustainable use of this region's unique ecosystems, which form the basis for the livelihoods of millions of people. Capacity-building in the affected Indian administrative and research institutions, as well as local user groups, aims to provide the resources and skills needed for the participative development of protective and sustainable usage models for aquatic natural resources in selected sections of rivers in four states. These usage models are then tested in the context of pilot projects. The establishment of local and international networks promotes knowledge sharing and the dissemination of good practice. The long-term goal of the project is to ensure the protection & sustainable management of aquatic freshwater ecosystems and thus the livelihoods of the riparian communities. Thus, the project aims to strengthen the knowledge and management capacities of state and local stakeholders for the protection and sustainable, climate-friendly management of aquatic freshwater ecosystems.
ProSoil: Soil Protection and Rehabilitation of Degraded Soil for Food Security	In India, the project is implemented by GIZ together with the National Bank for Agriculture and Rural Development (NABARD). It is being implemented in seven districts in Maharashtra and Madhya Pradesh and aims to protect or rehabilitate 153,000 ha of land by 2024. ProSoil is also developing and testing innovative and scalable approaches for sustainable soil management. It provides (digital) expert advisories on agroecological practices and climate-smart farming.

PROJECT	DESCRIPTION / OBJECTIVE
FES: Sustainable Management of Forest Ecosystem Services	The project "Sustainable Management for Forest Ecosystem Services" aims to strengthen forest and agroforest management to integrate the Forest Ecosystems (FES) approach with emphasis on water availability. The orientation towards sustainability in the FES concept serves both directly to the sustainable availability and protection of natural resources. The project supports increased orientation of forest and agroforest management towards FES, with a focus on water availability. It also contributes to climate resilience since climate change is endangering the availability of ecosystem services.
SAFAL: Sustainable Aquaculture for Food and Livelihood	SAFAL is a module of the Global Programme for Sustainable Fisheries and Aquaculture (GP Fish) commissioned and financed by the BMZ as part the Special Initiative 'One World – No Hunger' (SEWOH). SAFALs objective is to provide more fish products and higher income from sustainable and resource-efficient pond-based aquaculture for the food-insecure population in Assam and Odisha. The module promotes availability and access to fish as a nutrient-rich food, contributing to Sustainable Development Goal (SDG) 2 (zero hunger). The module also contributes to SDG 1 (no poverty) through productivity enhancement activities, improved business skills and promotion of income generating activities. Target groups are small-scale fish producers, Farmer Producer Organisations (FPOs), multipliers and policymakers. The political partner is the Ministry of Fisheries, Animal Husbandry and Dairying (MoFAHD), Government of India.
DPP Spices: DPP Spices Project on Establishing Sustainable Spice Supply Chain in four states of India	Objective: The project aims to strengthen the production of cardamom, cumin and turmeric in four states of India, by increasing the capacities of spice farmers and making the production practices economically, socially and environmentally more sustainable. Approach: Capacity development programme targeting spice farmers over four years covering approximately 10,000 ha to be integrated in AVT McCormick's supply chain in four states of India. This approach will: • Strengthen farmers skills on sustainable spice farming practices and agri-business management • Introduce a sub-set of farmers to organic farming practices • Build industry-wide capabilities around sustainable spice farming by providing buy-back arrangements and market access to the farming communities engaged in sustainable production of spices.
GIC: GIC for the Agriculture and Food Sector	Roughly half of India's population is engaged in the agriculture and food sector. As there is great potential for growth, the Indian government has set itself an ambitious goal: 'Doubling Farmers Income by 2022' and establishing 10.000 Farmer Producer Organisations by 2024. As a result, farmers will have better collective strength for improved access to quality inputs and sales markets. Working in line with these initiatives, the Green Innovation Centre India aims at increasing the yield and income of small holder farmers as well as the turnover of rural enterprises. By addressing common challenges such as inadequate inputs, price volatilities, storage constraints, and the occurrence of pests and diseases, the project disseminates innovative solutions along the value chains of three crops: potato, tomato, and apple. Within the activities, a special focus is set on women and youth. Innovations in the agriculture and food sector help increase smallholder income, boost employment and improve regional food supply in selected rural target regions. Therefore, the Green Innovation Centre India targets to create 1,800 new jobs for eco-preneurs, especially for youth and women and to provide training and education for 139,000 farmers. Through targeted training approaches, women entrepreneurship is promoted. In addition, the goal is to advise on Good Agricultural Practices (GAP) and to support the setting up of farmers organisations. The establishment of sustainable economic relationships between farmers and off-traders is a focus area.

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