CGIAR

INITIATIVE ON
Nature-Positive Solutions

CGIAR Initiative on Nature-Positive Solutions

ANNUAL TECHNICAL REPORT 2022

CGIAR Technical Reporting 2022

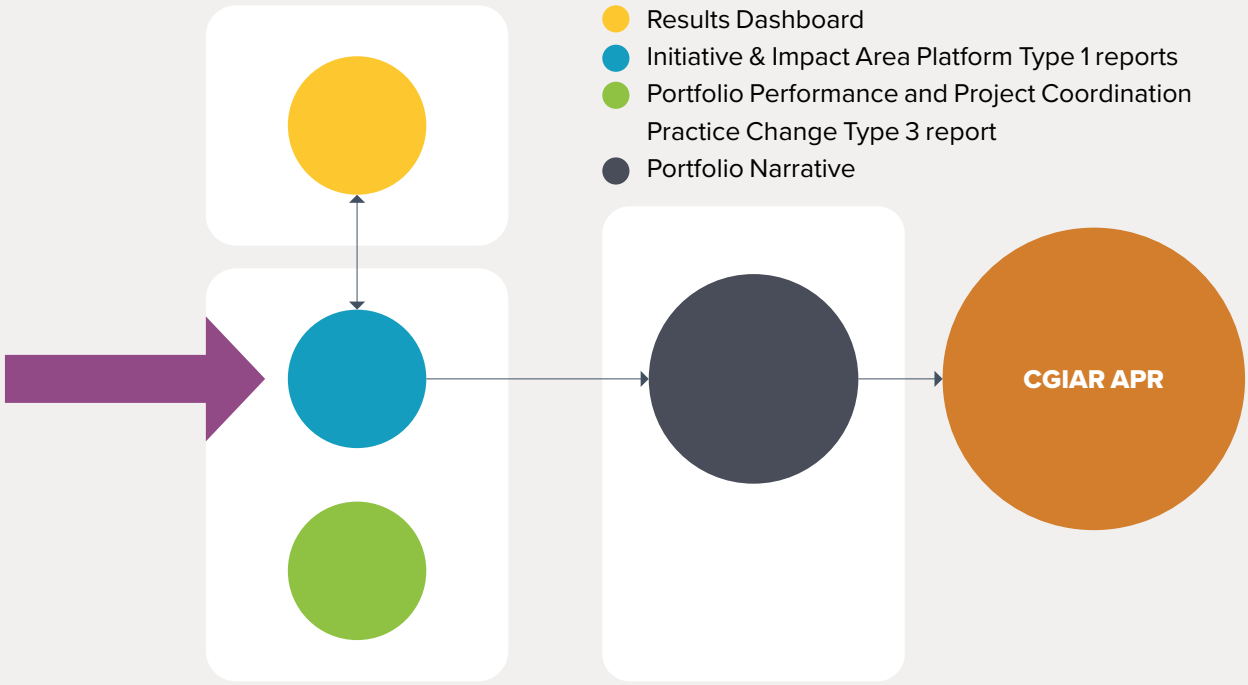
CGIAR Technical Reporting has been developed in alignment with the CGIAR Technical Reporting Arrangement.

This Initiative report is a Type 1 report and constitutes part of the broader CGIAR Technical Report. Each CGIAR Initiative submits an annual Type 1 report, which provides assurance on Initiative-level progress towards end-of-Initiative outcomes.

The CGIAR Technical Report comprises:

- Type 1 Initiative and Impact Area Platform reports, with quality assured results reported by Initiatives and Platforms available on the CGIAR Results Dashboard.
- The Type 3 Portfolio Performance and Project Coordination Practice Change report, which focuses on internal practice change.
- The Portfolio Narrative, which draws on the Type 1 and Type 3 reports, and the CGIAR Results Dashboard, to provide a broader view on portfolio coherence, including results, partnerships, country and regional engagement, and synergies among the portfolio's constituent parts.

The CGIAR Technical Report constitutes a key component of the CGIAR Annual Performance Report (APR).



US$	2022	2023	2024
Proposal Budget from initial submission	US$6,618,670	US$8,566,576	US$9,920,427
Approved 2022 Budget	US$4,430,996		

2022 Disbursement Target based on Approved FinPlan

Section 1 Fact sheet

Initiative name	Nature-Positive Solutions for Shifting Agrifood Systems to More Resilient and Sustainable Pathways
Initiative short name	Nature-Positive Solutions
Action Area	Resilient Agrifood Systems
Geographic scope	**Countries targeted in the proposal:** Burkina Faso; Colombia; India; Kenya; The Socialist Republic of Viet Nam **Countries with results reported in 2022:** Bangladesh; Bhutan; Bolivia; Burkina Faso; Burundi; China; Colombia; Ecuador; Ethiopia; Ghana; Guatemala; Honduras; India; Indonesia; Jordan; Kenya; Lao People's Democratic Republic; Malawi; Nepal; Nigeria; Peru; Rwanda; South Africa; South Sudan; Tanzania, United Republic; The Islamic Republic of Iran; The Socialist Republic of Viet Nam; Togo; Uganda; Zimbabwe
Start date	April 1, 2022
End date	Dec. 31, 2025
Initiative Lead	Carlo Fadda (c.fadda@cgiar.org)
Initiative Deputy	Solomie Gebrezgabher (s.Gebrezgabher@cgiar.org)
Measurable three-year End of Initiative outcomes (EOI-Os)	**EOI-O 1:** Women and men smallholder farmers, local communities, and National Agricultural Research and Extension Systems (NARES) in five low- and middle-income countries (LMICs) use National Policies and Strategies (NPS) stress-tested and validated by Nature-Positive Solutions to improve landscape-scale management of biodiversity for food and agriculture (BFA) via the farm-scale entry points of water, soil, waste, and land restoration.
	EOI-O 2: Women and men (including smallholder farmers) in five LMICs use Nature-Positive Solutions innovations and pathways to engage more directly in, and benefit more equitably from, value chains based on the outputs of biodiversity conservation, innovative rural waste management technologies, and circular economy principles.
	EOI-O 3: National Agricultural Research System (NARS) and other development actors in five LMICs systematically adopt participatory, multi-disciplinary approaches that make research more impactful, relevant to local AFS contexts and smallholder needs, and sustainable through local actor take-up.

	EOI-O 4: National and subnational policymakers in five LMICs acknowledge that true cost accounting should and will be applied to AFS-related policy formation.
	EOI-O 5: Public and private investment actors use Nature-Positive Solutions evidence, tools, and methodologies to gain a better understanding of the business case for NPS in five countries: Burkina Faso, Colombia, India, Kenya, and Viet Nam
OECD DAC Climate marker adaptation score*	**Score 1: Significant:** The activity contributes in a significant way to any of the three CGIAR climate-related strategy objectives – namely, climate mitigation, climate adaptation, and climate policy, even though it is not the principal focus of the activity.
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OECD DAC Gender equity marker score*	**Score 1A: Gender accommodative/aware:** Gender equality is an objective, but not the main one. The Initiative/project includes at least two explicit gender-specific outputs and (adequate) funding and resources are available. Data and indicators are disaggregated by gender and analyzed to explain potential gender variations and inequalities.
Website link	https://www.cgiar.org/initiative/12-nature-positive-solutions-enhancing-productivity-and-resilience-safeguarding-the-environment-and-promoting-inclusive-community-growth/

*The Organisation for Economic Co-operation and Development (OECD) Development Assistance Committee (DAC) markers refer to the OECD DAC Rio Markers for Climate and the gender equality policy marker. For climate adaptation and mitigation, scores are: 0 = Not targeted; 1 = Significant; and 2 = Principal.
The CGIAR GENDER Impact Platform has adapted the OECD gender marker, splitting the 1 score into 1A and 1B. For gender equality, scores are: 0 = Not targeted; 1A = Gender accommodative/aware; 1B = Gender responsive; and 2 = Principal.
These scores are derived from Initiative proposals, and refer to the score given to the Initiative overall based on their proposal.

Section 2 Initiative progress on science and towards End of Initiative outcomes

Young women herding native cattle in a tribal village adjoining Western Ghats, Maharashtra, India
Photo credit: 2022 Alliance of Bioversity International and CIAT / Christopher Kettle

Overall summary of progress against the theory of change

The main objective of 2022 was to introduce the concept of nature-positive Solutions to stakeholders in five countries, and to develop a roadmap in each country for its implementation. Against this goal, we have made very significant progress toward all End of Initiative (EOI) outcomes. Given the transformational ambition of the Initiative, we focused on co-developing and co-designing the interventions based on specific needs of countries and locations. We focused our efforts on the following stakeholders: farmers and farmers' organizations, research centers, policymakers, and the private sector.

We engaged with representatives of farmers' groups in four of the five target countries (with the exclusion of Colombia) to understand the current practices and assess how nature-positive approaches can contribute to transition to more sustainable practices (linked to EOI outcomes 1 and 2). We discussed pathways to achieve economically viable nature-positive systems, by identifying a preliminary value chain to focus on, and how we can create economies of scale for selected value chains. In practical terms, we identified potential value chains not only for crops, but also for trees and waste. These are a combination of staple (sorghum, millets, rice), high-value (fruits and vegetables), and traditional crops (traditional vegetables, roots and tubers, legumes). We have also promoted the informal seed system as a way to make selected varieties and crops available to the farmers and make these systems financially viable. With respect to value chains for agricultural waste, we identified and assessed resource recovery and repurposing waste for use as energy, feed, bio-fertilizers, and consumer and industrial product applications (linked to EOI outcome 2). We agreed that resource recovery from waste will also provide input for biodiversity management, as well as restoration of degraded land. An important area of discussion was about selecting tree species to be used in restoration which can have multiple uses and benefits to the communities, in terms of food and nutrition security (fruits, including wild fruits) and/or non-timber products that can be promoted

for the market. We also agreed that it is important to promote the development of value chains for indigenous tree species for community-based entrepreneurial nurseries. In addition, we discussed how to promote new value chains for indigenous species with high-nutrient content, medicinal properties, or which are valuable for livestock fodder (linked to EOI outcome 2). The initial discussion during the inception meetings was followed by further meetings to refine the approach. As a result, several technical protocols were developed and can be found here.

Working on complex planning of ecosystem services through the land/water/biodiversity integrated approach requires better coordination of different NARS departments. Also, developing a culture of participatory research will foster the behavior change we aim to achieve in EOI outcome 1. In 2022, we undertook discussions with the main national research centers in all the Initiative's target countries and drafted agreements with three of the centers to develop a full research framework for nature-positive implementation (linked to EOI Outcome 1). We discussed the need to co-develop more trans-disciplinary research programs and identify under-investigated research areas, for example minor crops, which have great potential to contribute to food and nutrition security, resilience, and country-specific livelihoods. These agreements and the one with the remaining national research centers (INERA in Burkina Faso, Agrosavia in Colombia, IARC in India, KALRO in Kenya and VAAS in Vietnam), will be finalized in 2023.

Governments are also important stakeholders; in Burkina Faso and Kenya we have identified multi-stakeholder platforms – involving private and public sectors, NGOs, and governments – through which we can operate, aiming at ensuring policies and incentives conducive to nature-positive production systems are in place, including, when possible, through payment schemes or supporting farming in their green economy transition (linked to EOI outcomes 1 and 5). Two such platforms are Intersectoral Forum on Agrobiodiversity and Agroecology (ISFAA) (Kenya) and the Neglected Species platform (Burkina Faso). In Kenya, we supported county planning government meetings in three of the selected districts (Kajiado, Vihiga, and Kisumu), ensuring the inclusion of nature-positive approaches in the priority areas for the counties (linked to EOI outcomes 1 and 5). Furthermore, in our engagement with policymakers at inception workshops in the five Initiative countries, we presented the true cost accounting (TCA) and started jointly developing an analytical framework. We discussed with each country the need for a mechanism that values externalities from agriculture and ecosystem services (linked to EOI outcome 4). The advantage of TCA is that it captures both the negative environmental, health, and social externalities as well as the positive ones, providing a broader perspective of agricultural impact on both the environment and society. Other approaches, such the Integrated Valuation of Ecosystem Services and Tradeoffs (InVEST), more specifically target ecosystem services, with a visual representation, through integration of remote sensing approaches, of the flow of ecosystem services. The draft model structure has been set up and model input data acquired. Those tools will be used to raise policymaker awareness of food system trade-offs. In addition, we are aware that market approaches do not always work. With policymakers we have discussed the feasibility of payment schemes, using as a model the Payments for Agrobiodiversity Conservation Services (PACS). The model uses public funds, in-kind compensation, and farmer group arrangements based on conservation tenders. It is an incentive mechanism that focuses on threatened plant and animal genetic resources with high public good values (e.g., food security, climate change, biodiversity). PACS provides incentives to farmers for in situ/on-farm agrobiodiversity conservation. It also covers a wide range of conservation and use management topics, such as prioritization, conservation target setting, facilitating access to threatened seed varieties, accounting for social equity, and monitoring and

Field Visit in Son La Province July 2022, Vietnam. Photo credit: 2022 Alliance of Bioversity International and CIAT / Eleonora De Falcis.

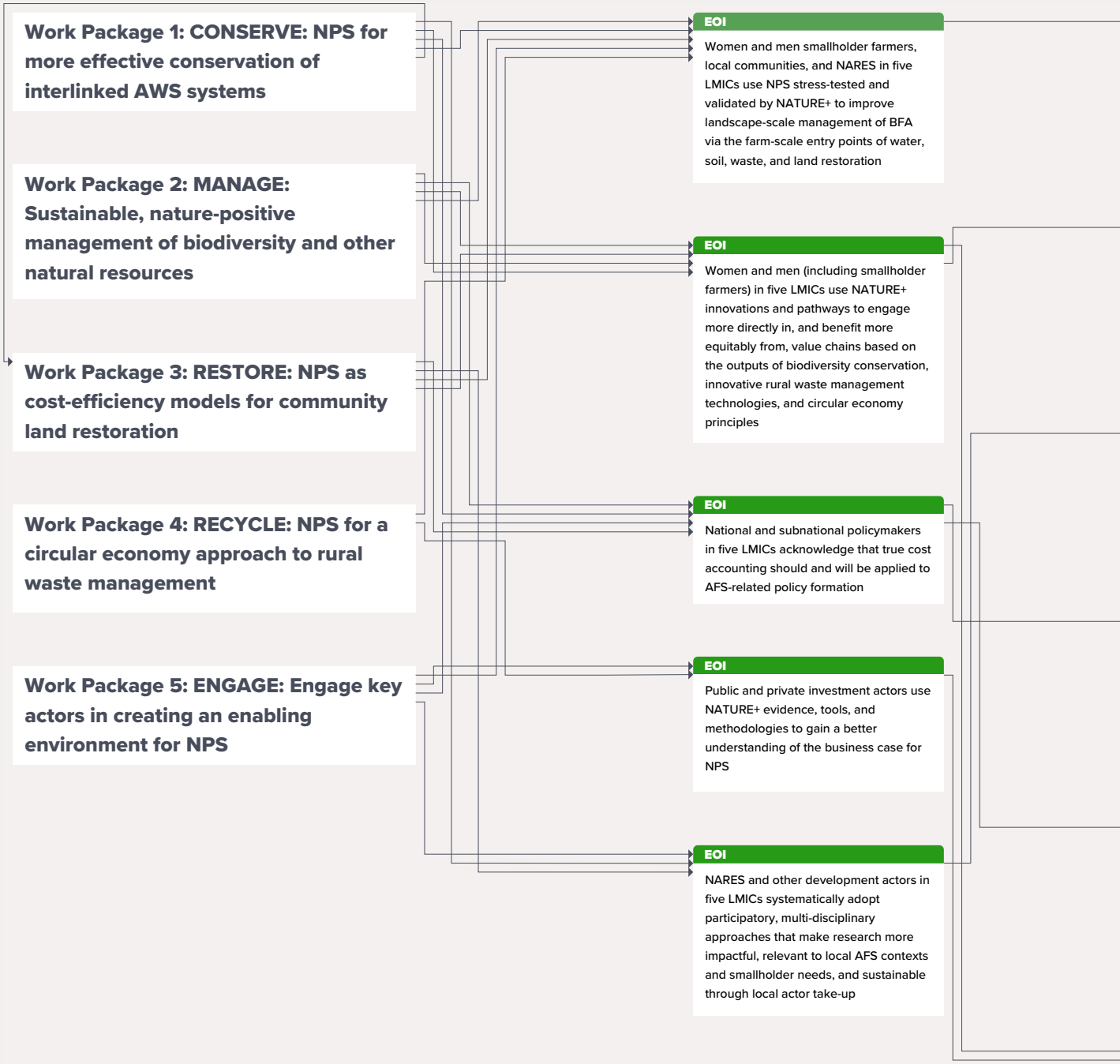
facilitating value chain development. Another model, the AGUAPAN case, based on voluntary benefit sharing mechanisms for so-called custodian farmers, will be scaled in Colombia based on experiences gained in Peru. It relies on private sector funds and direct monetary incentives for organized custodian farmers. In 2022, both the PACS and AGUAPAN models were systematized toward scaling in NATURE+ sites and presented as replicable models at the UN Biodiversity COP15 in Montreal, Canada.

Lastly, private sector engagement is key to scaling nature-positive solutions. Novel approaches to food processing are needed to better use the many crops and varieties grown by farmers and introduce them into the retail chain. Working with innovative companies is essential. Examples of our engagement this year include working with Dash Crop in Kenya, which produces blended flour from minor crops, and Mace Foods, a company that dries vegetables to extend their shelf life (linked to EOI outcome 2). Two key innovative approaches developed and promoted by the Nature-Positive Solutions Initiative, based on experience in Latin America, AGUAPAN and PACS, are ready for scaling (linked to EOI outcomes 2 and 3). However, before we can make significant progress towards these outcomes, we need to see results from the TCA, InVEST, and choice experiments in order to develop sound and scientifically based investment plans. Below we describe the two methodologies developed so far. Banks and other investors will be targeted using results from the same tools to invest on green economy transition and carbon markets.

The idea of integrating soil, water, biodiversity, and waste into a common implementation framework is innovative and complex. We have thus far developed three protocols through consultative workshops, covering all aspects of the Initiative. These protocols will form the basis for discussing action plans within the multi-stakeholder platforms and will be presented as an integrated plan for managing all aspects within the selected communities (linked to EOI outcomes 1 and 2). For agricultural waste, we developed protocols and business models for different uses of waste, including waste for bio-inputs for agriculture and energy, feed, and consumer and industrial application (linked to EOI outcome 2). Similarly, on biodiversity, we developed protocols for an in situ/ex situ integrated conservation strategy, participatory selection of crops and varieties, and development and strengthening of informal seed systems (linked to EOI outcomes 3 and 5). Innovative research includes a broader use of participatory action research, research on minor crops, and trans-disciplinary research on integrating agronomy and soil biodiversity in intercropping and crop-rotation research. For farmers, we started conversations in all five countries on what it entails to adopt and use integrated practices. On crop selection, it needs to include adaptation to local conditions, but also have climate-change adaptation and market potential. We also started collecting relevant information needed to create the decision support for target countries called Diversity4Restoration, which we will use to enable species selection for local restoration context and seed sourcing (linked to EOI outcome 2). In terms of innovative payment approaches, we proposed two different solutions, AGUAPAN and PACS, presented above (linked to EOI outcomes 3 and 5).

Initiative-level theory of change diagram

This is a simple, linear, and static representation of a complex, non-linear, and dynamic reality. Feedback loops and connections between this Initiative and other Initiatives' theories of change are excluded for clarity.



EOI — End of Initiative outcome

AA — Action Area

IA — Impact Area

SDG — Sustainable Development Goal

- Nutrition, Health, and Food Security
- Poverty Reduction, Livelihoods, and Jobs
- Gender Equality, Youth, and Social Inclusion
- Climate Adaptation and Mitigation
- Environmental Health and Biodiversity

Teams from CGIAR's three Action Areas — System Transformation, Resilient Agrifood Systems and Genetic Innovation — worked to develop an improved set of Action Area outcomes in October 2022. Since this was near the end of the reporting cycle for 2022, it was decided not to update the theories of change based on these new Action Area outcomes.
The exception to this is Genetic Innovation — for this Action Area, as the new outcomes had already been widely discussed among the relevant Initiatives, and with its advisory group of funders and other stakeholders, the decision was made to update their outcomes in time for the 2022 reporting cycle.

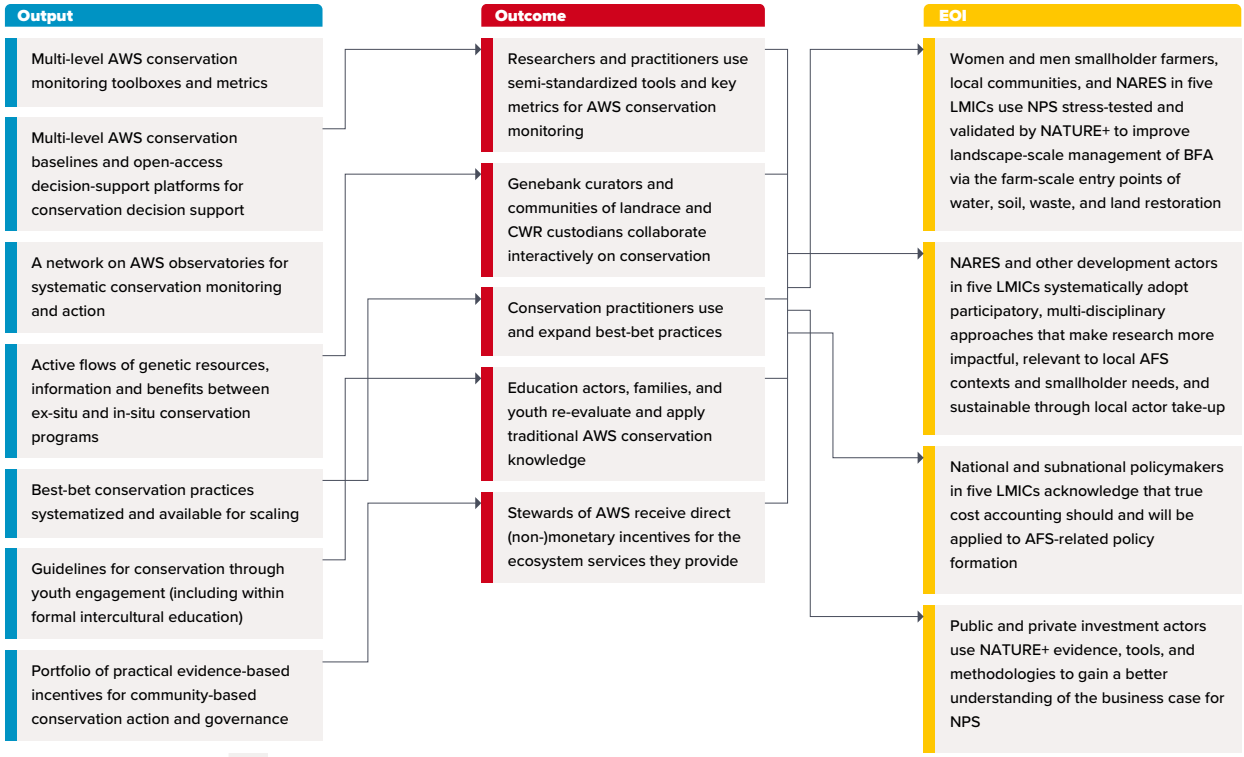
Progress by End of Initiative outcome

EOI-O 1: Women and men smallholder farmers, local communities, and NARES in five LMICs use NPS stress-tested and validated by Nature-Positive Solutions to improve landscape-scale management of biodiversity for food and agriculture (BFA) via the farm scale entry points of water, soil, waste, and land restoration.	This outcome is based on participatory action research that ensures the co-development of the intervention portfolio for the integrated management of soil/water/waste/biodiversity. In 2022, through Initiative inception meetings and stakeholder group interactions in all five target countries, we significantly advanced our understanding of the priorities and the options toward co-development of the intervention portfolio for the integrated management of soil/water/waste/biodiversity. Protocols for conservation strategies, participatory variety selection and breeding, and seed systems have been developed for all countries. For trees, we have started collecting the species and ethnobotanical information needed to create diversity for restoration.
EOI-O 2: Women and men (incl. smallholder farmers) in five LMICs use Nature-Positive Solutions innovations and pathways to engage more directly in, and benefit more equitably from, value chains based on the outputs of biodiversity conservation, innovative rural waste-management technologies, and circular economy principles.	Transition toward nature-positive production requires economic returns for the smallholder farmers and the other value-chain actors. Value chains are seen as one way to transform food systems, by focusing on under-researched crops with the potential to be resilient, more nutritious, and can potentially contribute to food security. Food produced should minimize exposure to hazards like pesticide residues, (thus also enhancing food safety), while offering attributes that are relevant for consumers and markets. In 2022, we selected the priority crops (mostly those with market potential) for most of the sites. We also identified some private sector actors in Kenya, Burkina Faso, and Viet Nam to develop the value chain. From previous engagement, farmers are already linked to these actors.
EOI-O 3: NARS and other development actors in five LMICs systematically adopt participatory, multi-disciplinary approaches that make research more impactful, relevant to local AFS contexts and smallholder needs, and sustainable through local actor take-up	The transformation we aim to achieve starts from strengthening research to enable a trans-disciplinary transition and embracing research that is not a priority under current strategies. This includes a participatory approach to include traditional and indigenous knowledge in the solutions we propose. To achieve this outcome, in addition to NARS, in 2022 we have started working with development partners, so that they appreciate the complexity of promoting nature-positive capacity development for the farmers. We have also laid important foundations toward outcome achievement by engaging in discussions with Mercy Corps, Practical Action, PELUM, Afrique Vert, among others.

EOI-O 4: National and subnational policymakers in five LMICs acknowledge that TCA should and will be applied to AFS-related policy formation	In 2022, we engaged with policymakers in the five Initiative countries, discussing the need for a mechanism that values externalities from agriculture and ecosystem services. TCA captures negative, positive, environmental, and social externalities, thus providing a broader perspective of agricultural impact on the environment and society. We also proposed two key innovative payment approaches (AGUAPAN and Payments for Agrobiodiversity Conservation Services (PACS)) developed and promoted by the Initiative. These interactions and approaches lay strong foundations for next steps, such as TCA data collection in Viet Nam and Kenya in 2023. As we present results to policymakers and other stakeholders, it will be important to also explore the replicability of the approach. At the same time, we need to have a measure of the value of ecosystem services, both positive and negative, to ensure the government balance sheet can take them into account for planning purposes.
EOI-O 5: Public and private investment actors use Nature-Positive Solutions evidence, tools, and methodologies to gain a better understanding of the business case for NPS	In addition to the value-chain approaches described earlier, we made good progress this year through payment for ecosystem services through two stated-preference choice experiment surveys for farmers and the public in western Kenya.

Section 3 Work Package-specific progress

Work Package 1:
CONSERVE: NPS for more effective conservation of interlinked AWS systems

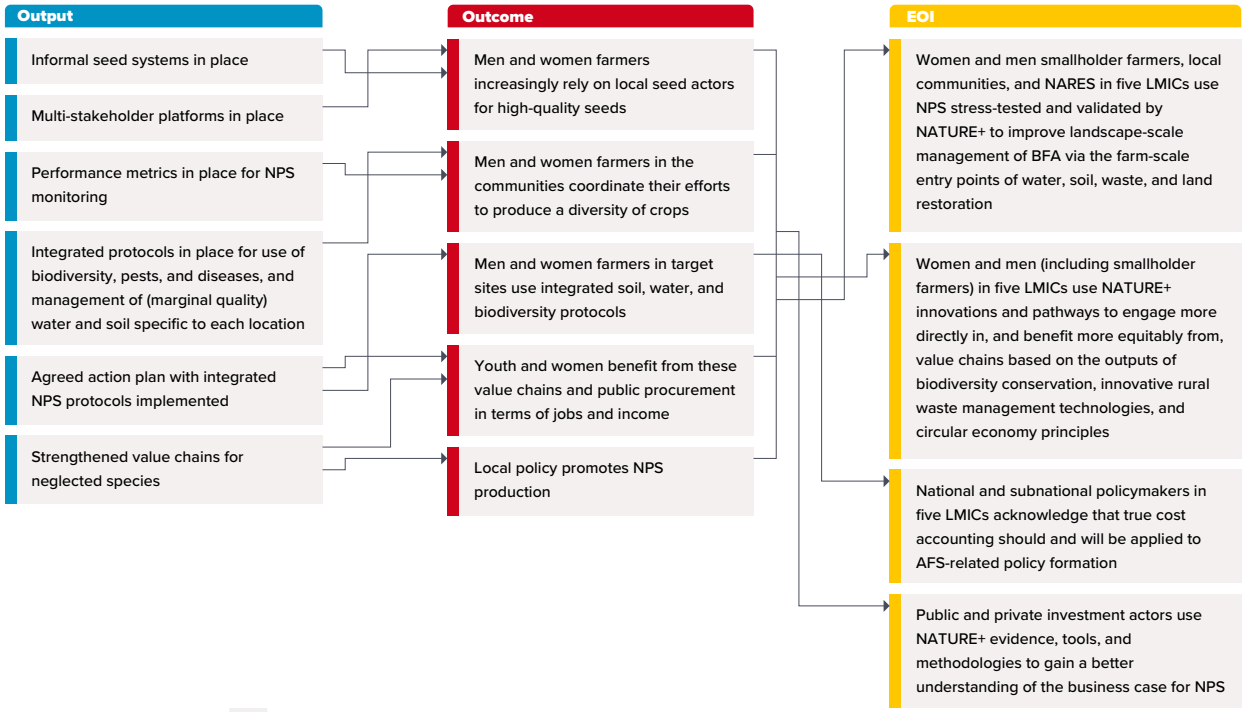


Work Package 1 progress against the theory of change

In 2022, we have made significant advances in the following areas of WP1:

- We have coordinated and formulated agreements between national genebanks and the Initiative toward integrated conservation linking ex- and in-situ approaches in Viet Nam and Colombia, and we are in conversation with the genebanks of Kenya and India.
- We have developed a framework paper between the CGIAR's genebank platform and the Initiative to specify the functions of integrated conservation: back-up, monitoring, complementary knowledge, reciprocity (under review).
- We have developed an on-farm conservation-monitoring toolbox, including ten tools for diversity assessments in key hotspots. Tools include genetic fingerprinting, cataloguing and pGIS, among others, to assess the spatial distribution of landraces. Most tools were published as PDF files in Spanish, with the full launch of a website in Spanish and English foreseen for 2023. Examples include: rapid diversity assessment, field trials and morphological descriptors, plant photography, qualitative red listing, learning projects through education, among others.
- Nature-Positive Solutions and the Seed Equal Initiative co-developed a citizen science tool for diversity monitoring (with WP1 developing a knowledge portal for potato landraces).
- We developed rapid baselines for sites in two out of the five Initiative target countries.
- We developed a proof-of-concept study with a 100-year timeline to infer upon the conservation status of landrace conservation (preservation, loss, enrichment) in one of the world's global potato hotspots. The proof-tested approach can now be applied and expanded to other crops and regions. Databases were uploaded onto the Dataverse platform (examples are: Prove of concept study for in-depth hotspot-level ABD/varietal diversity timeline comparison: dataset Vargas (1949-1954) occurrence, and Prove of concept study for in-depth hotspot-level ABD/varietal diversity timeline comparison: dataset 5-cell method).
- We documented two Payment for Agrobiodiversity Conservation models developed in Peru for replication in Initiative countries: PACS and AGUAPAN models using public and private funds respectively (Resilient, healthy, and sustainable food systems for biodiversity conservation and use 2030 Action Targets: A global collection of good practice cases).

Work Package 2:
MANAGE: Sustainable, nature-positive management of biodiversity and other natural resources

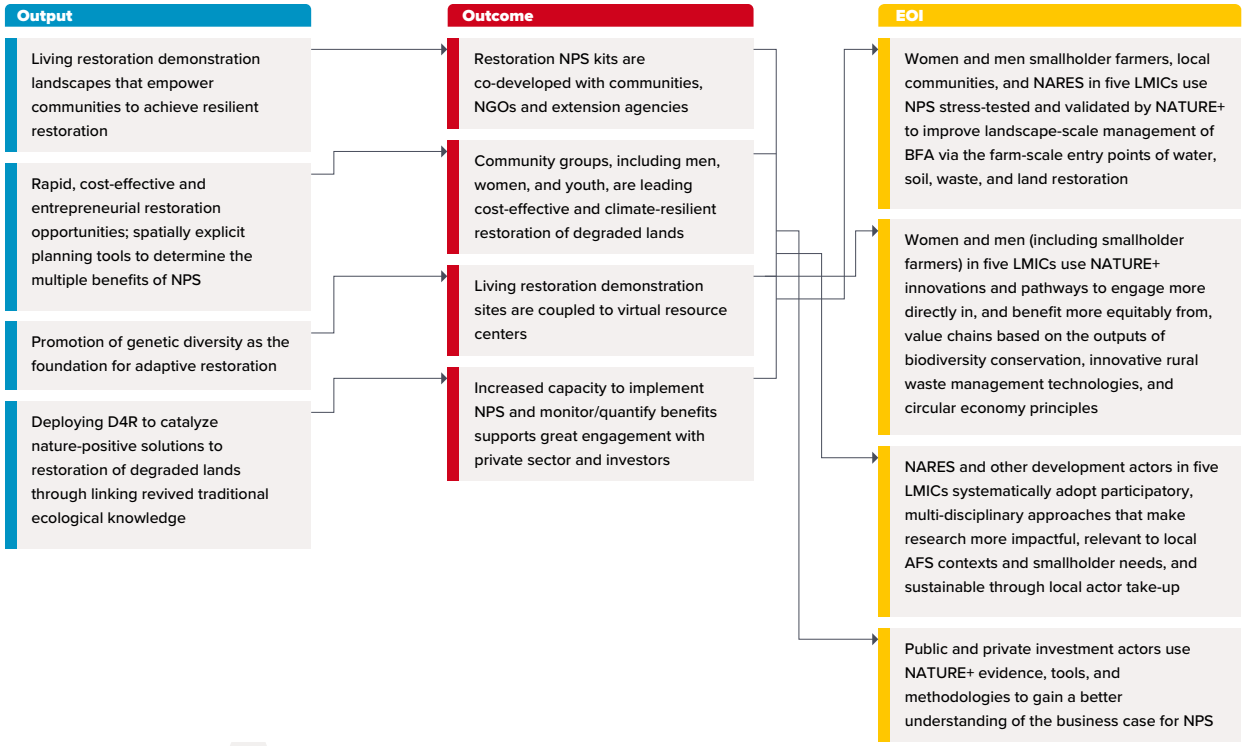


Work Package 2 progress against the theory of change

The objectives of WP2 have been fully achieved.

- Evidences on the methodology to be used for the improvement of Neglected and Underutilized Species was published, including from different countries.
- We developed protocols to implement integrated approaches, identified sites in each country, and initiated engagement with national and local stakeholders. In addition, in most of the sites, we started identifying key value chains.
- We have advanced our contacts with the private sector in Kenya for the production of resilient crops, as well as cash crops like pyrethrum for production of bio-pesticide.
- In all countries, through our inception workshops, we laid the foundations to develop the multi-stakeholder platforms through which the Initiative will be implemented. This has different levels of engagement in different countries, but stakeholders in all the target countries have expressed a strong interest in collaborating on nature-positive agriculture, which emerged during both the preparation (2021) and inception phases (2022).
- We developed protocols for the different research areas covered by the Work Package on biodiversity, establishment of community seed banks, as well as preliminary work on soil. Regarding the informal seed systems, we have conducted a quick review of legislations in the five target countries to assess the enabling environment. In addition, we have produced scientific reviews of the importance of informal seed systems for vegetables and in East Africa.
- We have made headway on identifying value chains for the different countries – particularly focusing on minor, high-value crops such as fruits and vegetables, as critical entry points and methodologies to develop the value chains.
- We developed important partnerships, such as the one with Wageningen University and Research (WUR) to design farming systems that are nature-positive and identify critical indicators to measure success.
- Finally, we received a small grant from the United Nations Environment Programme (UNEP) to perform a stocktaking of nature-positive practices (see Annex 1). This is also important for building the partnership between this initiative and UNEP.

Work Package 3:
RESTORE: NPS as cost-efficiency models for community land restoration



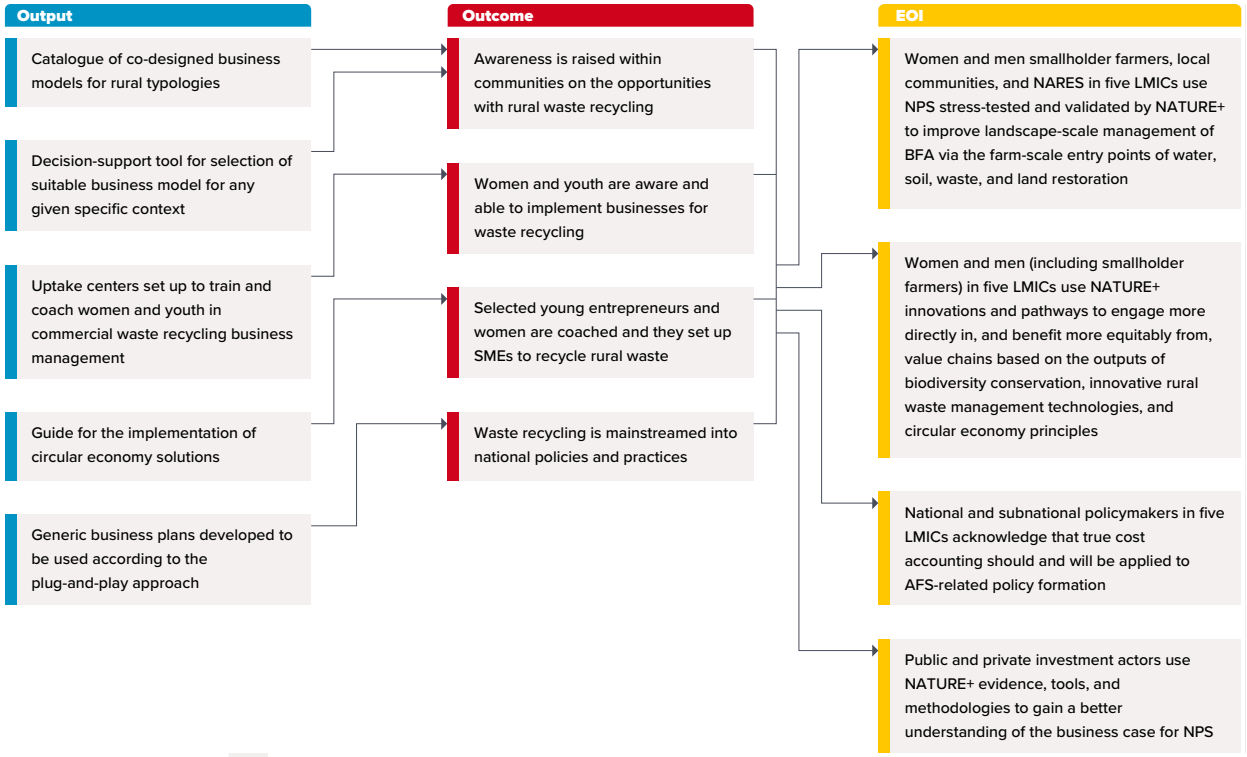
Work Package 3 progress against the theory of change

WP3 is well on track and has exceeded expectations in multiple countries.

Key results over the last year:

- We have coordinated and established Letters of Agreement with key national partners in all target countries, to identify sites for living restoration labs.
- We have completed seed system assessments for native tree species' genetic diversity in Burkina Faso, Kenya, and India, for both formal and informal systems, to understand critical barriers to integrate tree genetic diversity, with a focus on youth and women in the forest genetic resources value chain.
- We have conducted stakeholder mapping and engagement with restoration learning labs, bringing together communities, public administrators, scientists, investors, private sector, and policymakers, to discuss the value of restored ecosystem services and incentives (linked to WP5). We have also organized workshops with key restoration partners to understand lessons learned from past restoration efforts in Burkina Faso and Kenya. Moreover, we have held discussions on selection of sites as living labs for restoration in 2023 for Burkina Faso, Colombia, and Viet Nam.
- We have conducted training and awareness-raising on the use of the Diversity for Restoration (D4R) decision support tool for indigenous tree species selection for restoration and agroforestry interventions for nature-positive solutions, to restore degraded lands across different landscapes in Burkina Faso and India.
- One PhD student started research on evaluation of pollination services, and pollinator-friendly nature-positive solutions in Kenya; three PhD students started working on indigenous fruit tree conservation, production, and value chains in India.
- We have conducted an evaluation of functional traits of native trees (180 spps) for D4R in India.
- We validated demand for restoration by investors and local communities in Burkina Faso, Kenya and Viet Nam. However, decision-making on restoration is clearly influenced by costs and needs.

Work Package 4:
RECYCLE: NPS for a circular economy approach to rural waste management

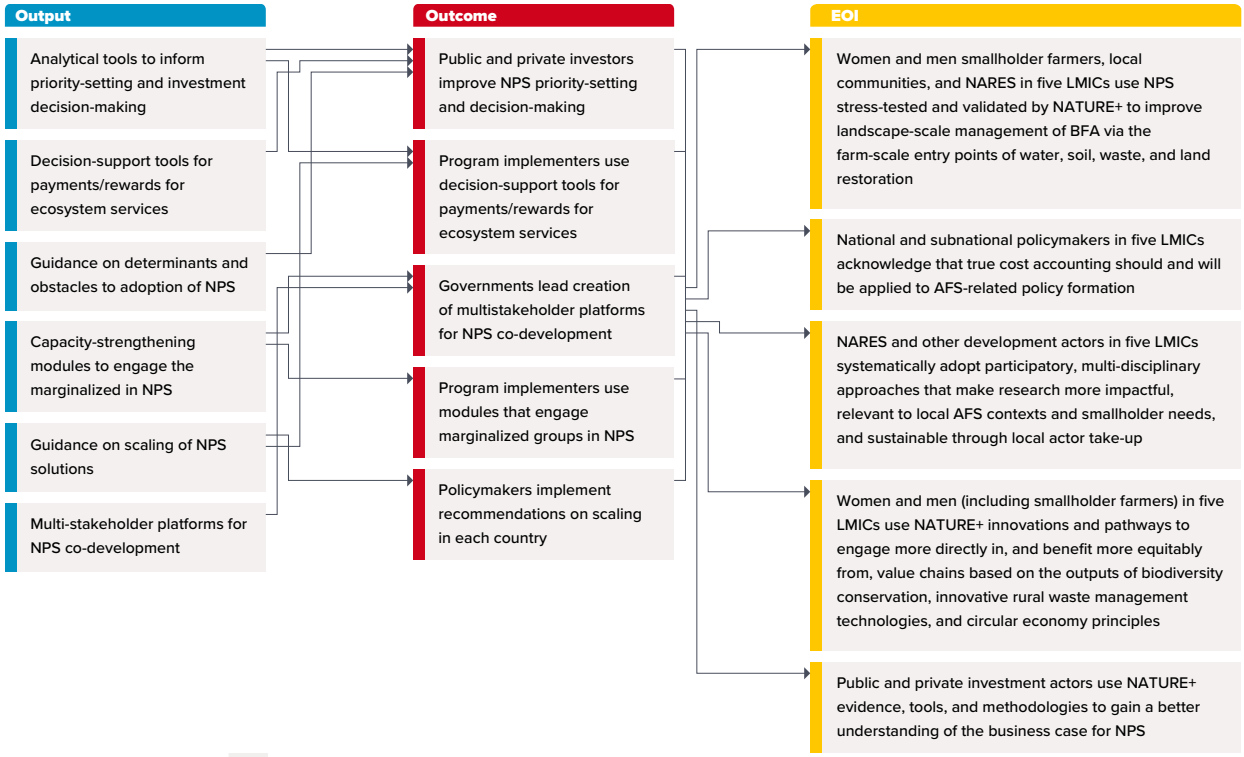


Work Package 4 progress against the theory of change

For WP4, we have made good progress toward End of Initiative outcomes:

- We have completed country investment climate (enabling environment) assessments for circular bioeconomy (CBE) in Burkina Faso, India, and Kenya. As part of identifying and adapting suitable CBE innovation bundles for each target country, we have identified and analyzed 24 CBE business models across the five target countries. We have published the country investment climate reports and the CBE business models:
  - Investment climate assessment for circular bioeconomy - review of national policies and strategies in Kenya (cgiar.org)
  - Investment climate assessment for circular bioeconomy sector in India: an assessment of the institutions, policies, regulations and financial environment (cgiar.org)
  - Enabling environment for circular bioeconomy sector in Burkina Faso (cgiar.org)
  - Emerging circular bioeconomy business models - consumer products from agricultural waste: cases from Kenya and India (cgiar.org)
  - Circular bioeconomy business models – energy recovery from agricultural waste: cases from Kenya and Burkina Faso (cgiar.org)
  - Circular bioeconomy business models – recovering food products to reduce agricultural waste: cases from Burkina Faso, India, Kenya and Vietnam (cgiar.org)
- We have initiated engagement with national and local stakeholders through a stakeholder workshop to present, validate, and promote CBE models in the target countries.
- We have completed an irrigation suitability mapping for the five target countries, that will contribute to the cross-cutting soil and water management aspects of the Work Package.
- All assumptions hold in all target countries:
- Countries have some experience with recycling.
- There is a demand for recycling solutions.
- Training center to be hosted in existing training center.
- The policy framework does not prevent implementation of waste recycling.

Work Package 5:
ENGAGE: Engage key actors in creating an enabling environment for NPS



Work Package 5 progress against the theory of change

To answer the research questions, we developed data-collection instruments to be used in the five Initiative countries. These included four qualitative data-collection tools (key informant interviews, focus group discussion on nature-positive solutions, and participatory and sex-disaggregated seasonal calendars and resource mapping), a household-level baseline survey, a community survey, and a workers' survey for TCA. We recruited data-collection firms in India, Kenya, and Viet Nam, and worked with country and CGIAR partners in the three countries to validate the instruments. We drafted an analytical framework for TCA and acquired data for InVEST modeling. We conducted a literature review and set up a database for ecosystem services valuation in Kenya and Viet Nam. We conducted stated-preference surveys among farmers and the public in Western Kenya regarding economic valuation of ecosystem services and published a report.

These activities and others provided good progress in 2022 toward the End of Initiative outcomes. We produced 13 key results, which can all be found in the Results Dashboard: six knowledge and seven other products – four journal articles (e.g., Bt cotton area contraction drives regional pest resurgence, crop loss, and pesticide use, and How Do Game Design, Gender, and Players' Backgrounds Affect Behavior in Framed Field Experiments? Evidence from Community Forestry in India), three project reports, four stakeholder meeting reports, one presentation, and one database.

- Our Work Package assumptions mainly hold true. Assumption 1 is there is political stability – this holds true, except in the case of Burkina Faso. Assumption 2 is that governments and the private sector are willing to invest funds in solutions – this holds and initial discussions with subnational governments in Kenya show a willingness to invest. Assumption 3 is that solutions respect and build on local social groups and address power inequities – the underlying approach to solutions is participatory and inclusive. Two key results under assumption 3 had significant gender components:
- The project report "Farmer and general public economic valuation of ecosystem services in the context of agroecological practice adoption in Western Kenya" examined differences in women's and men's willingness to adopt nature-positive solutions or ecosystem services.
- The journal article "Agro-biodiversity in national pathways for food system transformation: the case of West Africa" is relevant because neglected and underutilized species can be cultivated in small plots, diversify diets for vulnerable groups, and create economic opportunities.

Work Package progress rating

WORK PACKAGE	TRAFFIC LIGHT / RATIONALE
1	WP1 is on track. Foundations were laid for the groundwork in 2023: baselines, tools, partnerships, and site selection.
2	WP2 is well on track to establish the required partnerships for implementation, including with NARS, policymakers, and the private sector. In addition, having developed the protocols for different interventions, we can start discussing implementation plans.
3	WP3 is on target with critical partnerships and platforms established for key activities in 2023: establishment of living labs, capacity development on nature-positive practices, tools developed, and carbon evaluation of nature-positive intervention conducted.
4	In 2022, we focused on identifying existing CBE innovations in the target countries to inform the co-design, implementation, and scaling-up of the CBE models. We have identified and analyzed 24 CBE business models across the five target countries. We have also identified and engaged local partners in all the target countries to implement the CBE models through the establishment of innovation hubs in 2023.
5	While baseline data collection was delayed by a couple of months, existing results already provide analytical tools for priority-setting and investment decisions, guidance for adoption of nature-positive solutions, and decision tools for ecosystem services. We have established multi-stakeholder platforms in each country, and we are implementing and collating capacity modules to engage marginalized groups in nature-positive solutions.

KEY	
On track	• Annual progress largely aligns with Plan of Results and Budget and Work Package theory of change • Can include small deviations/issues/ delays/risks that do not jeopardise success of Work Package
Delayed	• Annual progress slightly falls behind Plan of Results and Budget and Work Package theory of change in key areas • Deviations/issues/delays/risks could jeopardise success of Work Package if not managed appropriately
Off track	• Annual progress clearly falls behind Plan of Results and Budget and Work Package theory of change in most/all areas • Deviations/issues/delays/risks do jeopardise success of Work Package

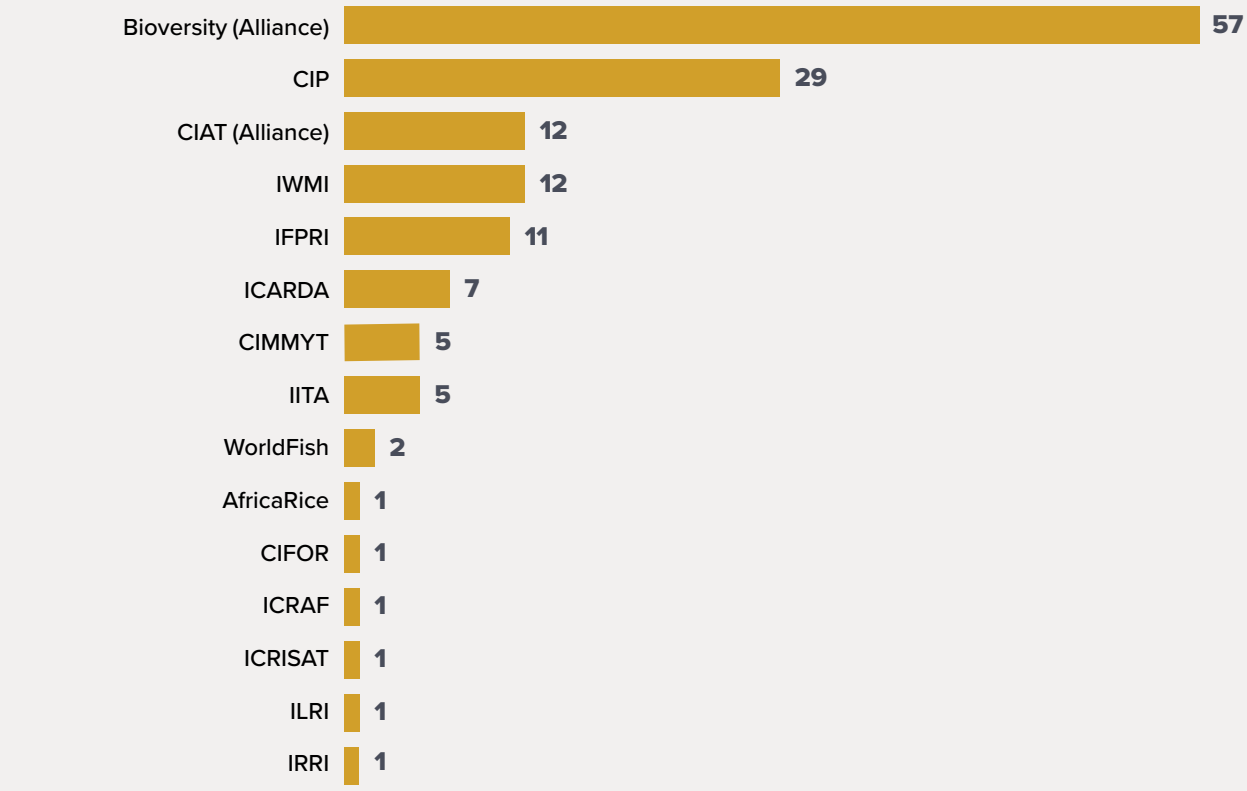
Section 4 Initiative key results

This section provides an overview of 2022 results reported by Nature-Positive Solutions. These results align with the CGIAR Results Framework and Nature-Positive Solutions theory of change. Further information on these results is available through the CGIAR Results Dashboard.

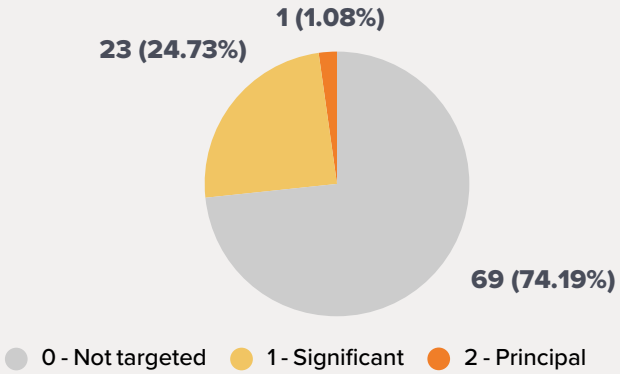
Overview

Results	Outputs					Outcomes	
93	8 SDGs	5 Capacity sharing for development	13 Innovation development	51 Knowledge products	20 Other outputs	2 Innovation use	2 Policy change

Contributing CGIAR Centers



Results by gender tag

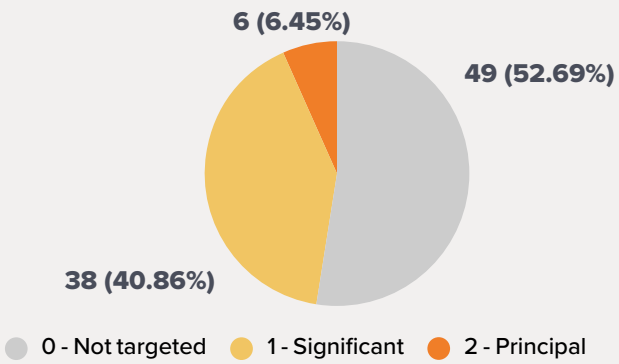


0 = Not targeted: The activity/result does not target gender equality.

1 = Significant: The activity/result contributes in significant ways to gender equality, even though it is not the principal focus of the activity.

2 = Principal: Gender equality is the main objective of the activity/result and is fundamental in its design and expected results.

Results by climate change tag

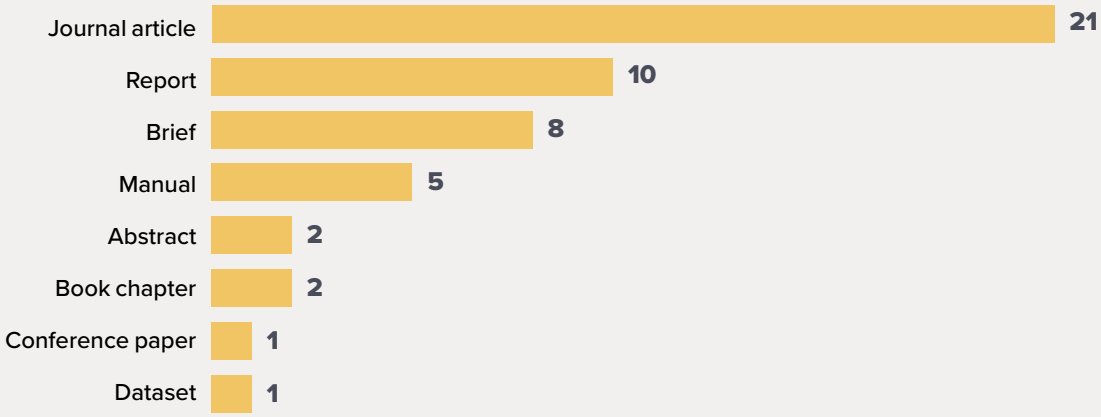


0 = Not targeted: The activity does not target climate mitigation, adaptation, and climate policy goals of the CGIAR as put forward in its strategy.

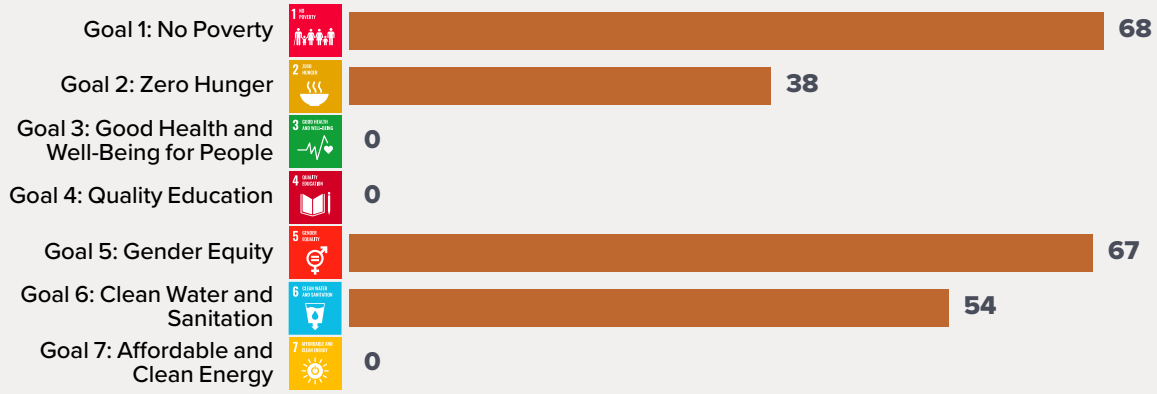
1 = Significant: The activity contributes in significant ways to either one of the three CGIAR climate-related strategy objectives — namely, climate mitigation, climate adaptation, and climate policy, even though it is not the principal focus of the activity.

2 = Principal: The activity is principally about meeting either one of the three CGIAR climate-related strategy objectives — namely, climate mitigation, climate adaptation, and climate policy, and would not have been undertaken without these objectives.

Knowledge products by category



Sustainable Development Goals contributions

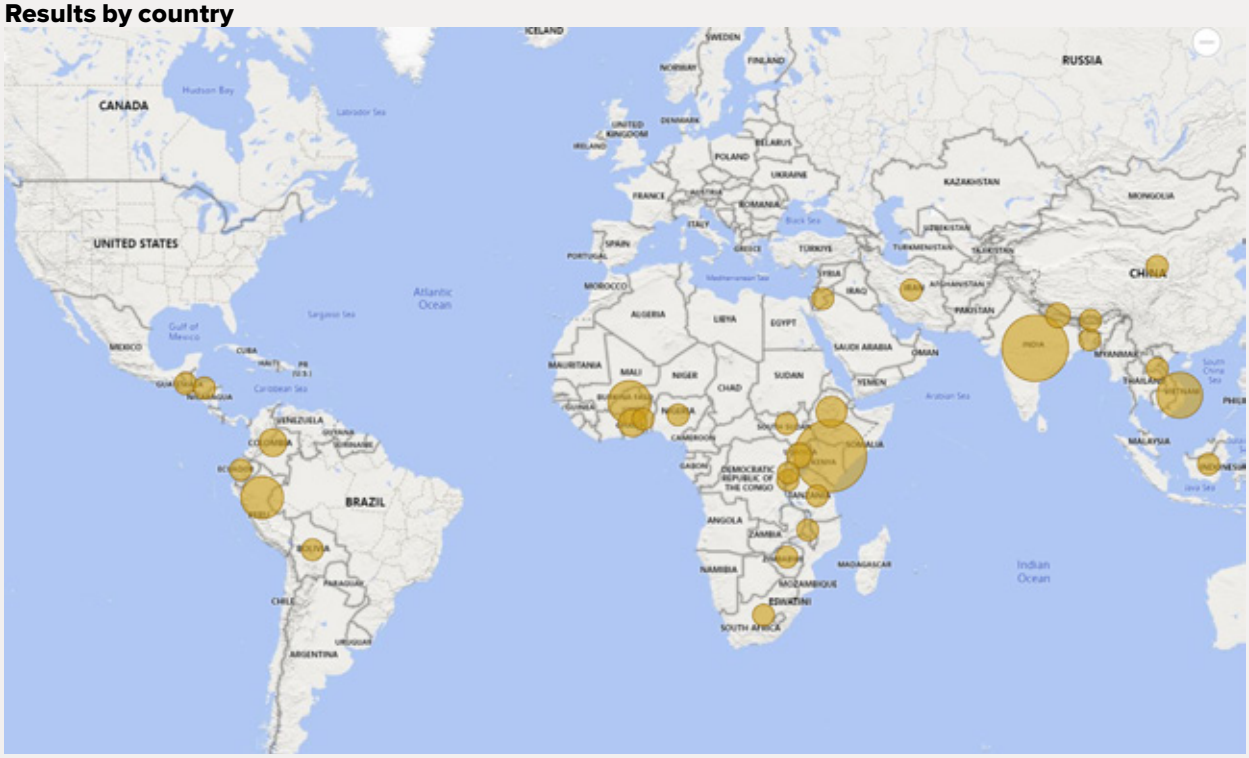


Innovations by readiness level

Pipeline overview
Number of innovations

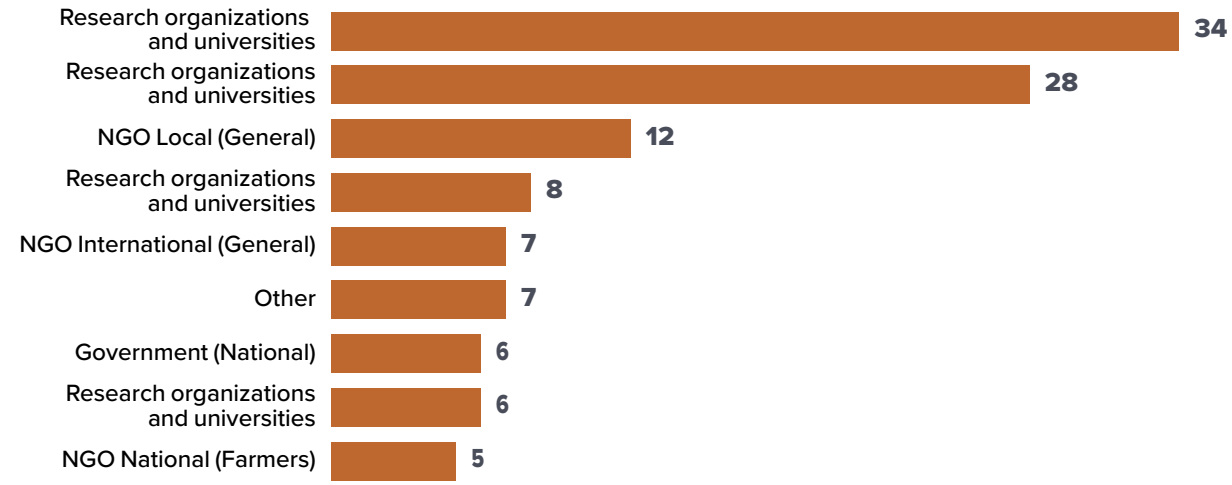
9	PROVEN INNOVATION – The innovation is validated for its ability to achieve a specific impact under uncontrolled conditions	2
8	UNCONTROLLED TESTING – The innovation is being tested for its ability to achieve a specific impact under uncontrolled conditions	0
7	PROTOTYPE – The innovation is validated for its ability to achieve a specific impact under semi-controlled conditions	2
6	SEMI-CONTROLLED TESTING – The innovation is being tested for its ability to achieve a specific impact under semi-controlled conditions	2
5	MODEL/EARLY PROTOTYPE – The innovation is validated for its ability to achieve a specific impact under fully-controlled conditions	2
4	CONTROLLED TESTING – The innovation is being tested for its ability to achieve a specific impact under fully-controlled conditions	1
3	PROOF OF CONCEPT – The innovation's key concepts have been validated for their ability to achieve a specific impact	1
2	FORMULATION – The innovation's key concepts are being formulated or designed	0
1	BASIC RESEARCH – The innovation's basic principles are being researched for their ability to achieve a specific impact	2
0	IDEA – The innovation is at idea stage	1

Results by country



Section 5 Impact pathway integration – External partners

Results by partner type



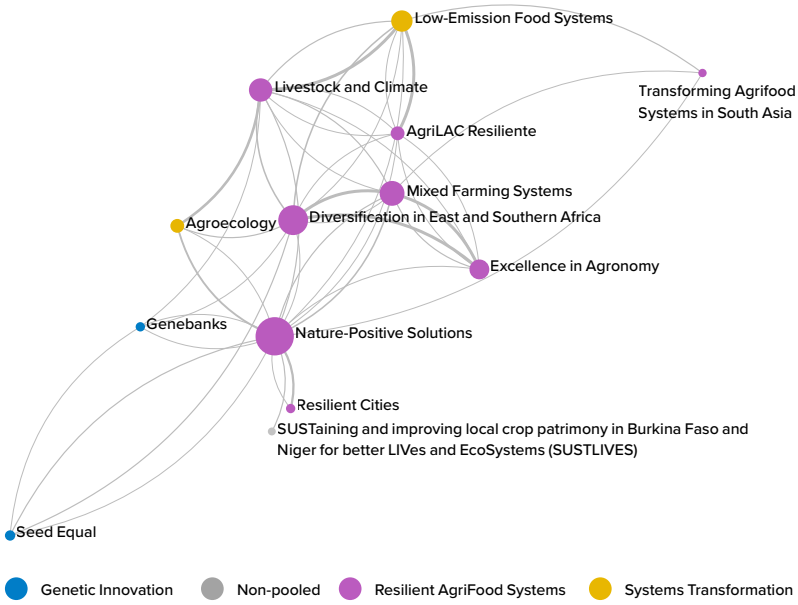
Partners by country

Partnerships and Nature-Positive Solutions' impact pathways

There are two main pillars on partnership with external actors. One is a solid research partnership with international and national universities to respond to NARS demand. The other is ensuring that the CGIAR Research Initiative on Nature-Positive Solutions has the required support and enabling environment, which includes policymakers, extension services, and other development partners and the private sector. All of these stakeholder groups are critical to implementing the Initiative at scale, and during this first year of implementation we made progress to varying degrees in all the target countries. Although complex to manage, we find a multi-stakeholder platforms approach the most suitable. However, establishing new platforms is time-consuming and complex, hence we linked up with existing ones. In Kenya and Burkina Faso, we identified existing platforms that agreed to include a nature-positive agenda in their work. For the other countries, we are exploring options. Within the platforms, we have identified specific partners to work with. For example, in Kenya we are working more directly with Participatory Ecological Land Use Management (PELUM) – a network of Civil Society Organizations and NGOs –and World Wide Fund for Nature (WWF) and in Burkina Faso with Afrique Vert as local development partners. In addition, we started identifying suitable private sector actors for the diverse products we aim to produce, which are not standard, build on agrobiodiversity, and aim at improving nutrition and food security. It is critical to engage with the food-processing industry to identify suitable technologies for developing new and nutritious food. This approach will create an enabling environment with raised awareness of the different stakeholders, nationally and locally, and to contact private sector actors that can help develop the value chains for the selected commodities.
As for research, our trans-disciplinary approach requires adding agendas in the NARS that are not currently present. We started conversations around the research approach of the Initiative in different countries, to ensure that we can jointly develop a research strategy around the use of agrobiodiversity and the traditional crops to address resilience, and food and nutrition security.

This will require putting in place a crop improvement strategy for such crops. This should be carried out hand-in-hand with soil and water research, to be able to identify the most suitable agronomic practices for these crops, which includes the development of targeted biofertilizer from the recycling of waste, as well as the use of soil microbiology, including amendment to boost plant vigor and health. This needs to be combined with collaborating with socioeconomists in NARS. Some models and tools will involve international universities as partners.

Section 6 Impact pathway integration – CGIAR portfolio linkages



Name	Action Area	Total connections	Total results
Nature-Positive Solutions	RAFS	43	65
Diversification in East and Southern Africa	RAFS	11	48
Mixed Farming Systems	RAFS	9	38
Livestock and Climate	RAFS	11	35
Low-Emission Food Systems	ST	8	31

Note: Initiatives, non-pooled projects, and the connections are sized by the number of results. The table includes the given initiative's top connections and is sorted by Total Results. The network and summary table include all connections for the given initiative, as well as the connections between the given initiative's connections (i.e. the ego network)

Portfolio linkages and Nature-Positive Solutions' impact pathways

The Initiative is well integrated within the CGIAR portfolio. It has collaborated with the Initiatives on **Aquatic Foods** and **Transforming Agrifood Systems in South Asia**, aimed at positioning CGIAR in the area of sustainable agriculture. Collaboration with **Agroecology** and **Low-Emission Food Systems** in system transformation and sustainable intensification and excellence in agronomy is critical to define different pathways and a framework to make agriculture more sustainable and reduce its negative impacts/the negative impacts generated by it. We realize that these frameworks are different and apply differently depending on the enabling factors, country demand, and type of agriculture implemented in a given context. Yet, the different approaches promoted by each of these Initiatives are aiming at similar goals and impacts. Collaboration happens at the level of practices, as well as developing a partially overlapping monitoring mechanism for similar sets of indicators. We also linked with **Resilient Cities** to best develop the circular economy strategies, which is a significant part of the Nature-Positive Solutions Initiative. Finally, we have engaged in areas of collaboration with Seed Equal and genebanks in the **Genebanks** Initiative. With Seed Equal, we aim to seek out opportunities for integrated seed systems. Nature-Positive Solutions has a strong emphasis on developing and strengthening informal seed systems, which will operate in a context in which more formal systems are present, hence the need to collaborate to develop strong integrated seed systems. Nature-Positive Solutions aims to increase diversity, including genetic diversity, in production systems. National and international genebanks are vast repositories of such diversity. There is growing consensus among current literature that this diversity needs to be and can be better used for adaptation to climate change. Nature-Positive Solutions is equipped with ready-to-use innovations to deploy this diversity among farmers and to be integrated within crop improvement programs. With the **Genebanks** Initiative we are collaborating on how we can improve direct use of material conserved in genebanks as part of a broader framework for integrated in-situ and ex-situ conservation.

Section 7 Adaptive management

RECOMMENDATION	SUPPORTING RATIONALE
Shift to country-led Initiative implementation	Following the first year of implementation of the Initiative, where the main focus was on setting up the country teams and kick-starting the work, the second year will provide the opportunity to empower the country teams and shift the focus from Work Package-led to country-led implementation. This will involve a review of the team set-up and communications toward a higher degree of responsibility of the country representatives, with clear tasks and activities assigned in each of the countries. The budget responsibility remains with Work Package leads, but, once agreed, the budget will be considered as allocated to the country.
Focus on external communication and fundraising	Initiative partners agree that a greater focus must be placed on communicating at global, country, and Work Package levels. No specific communication budget was earmarked for year 1, but a dedicated communication budget is planned for 2023 to support this goal. Communication will allow us to (i) communicate progress and achievements more broadly, and (ii) contribute to fundraising. Within the Initiative, we also agreed that should there be an appropriate call, we will try to develop a joint proposal between the majority of participating Centers. The Initiative will strategically prioritize activities to align with the given budget. As part of the communication drive, we discussed using the term "NATURE+" for visibility, which we find more compelling than Nature-Positive Solutions.
Enhance communication between the Work Packages and within the Initiative team	Another reason to delegate more responsibility to the countries is to ensure that a smoother, integrated implementation can be achieved. The strength of the Initiative is presenting a comprehensive strategy to make selected sites nature-positive. In other words, within the same community, we need a combination of conservation, management, restoration, and a circular economy. This requires a high level of integration and communication. To achieve this, we will implement a revised team structure to enable smoother information-sharing, we will strengthen linkages with existing bilateral projects, and we will shift from Work Package leads' meetings to broader management team meetings.
Adaptive and reactive strategy to manage the budget reduction	The budget gap remains a concern, particularly for implementation and to respond to all demands from partners in the five countries. We have reduced implementation intensity without reducing countries or communities as an adaptive strategy. We have agreed to strengthen collaboration to reduce to a minimum duplication of efforts (e.g., combining workshops for several Work Packages) and to search for and secure additional resources to close the funding gap.

Section 8 Key result story

Fuel wood collections in small holder farming systems just outside Ouagadougou, Burkina Faso.
Photo credit: 2022 Alliance of Bioversity International and CIAT / Christopher Kettle

The Alliance of Bioversity International and CIAT and United Nations Environment Programme (UNEP) rate top 20 net-positive practices in agriculture

A trailblazing agreement with UNEP allows scientists with the CGIAR Research Initiative on Nature-Positive Solutions to identify the best net-positive agricultural practices. The work could guide a decade of implementation of agricultural change to make food production biodiversity-friendly, climate-resilient and pollution-free.

The research will guide context-specific implementation of nature-based solutions in agriculture that will benefit individual farmers, communities, and regions, potentially reversing decades of negative impacts associated with unsustainable farming practices.

There is no shortage of ways to produce food in a manner that benefits nature, nor lack of urgency for requiring food systems to undergo radical transformation. But what evidence supports the

best practices that can be implemented at scale as part of the food system transformation? A new project within CGIAR's Nature-Positive Solutions Initiative aims to answer that question – and to debunk a few myths along the way.

Funded by UNEP, the project aims to untangle existing evidence for the common practices pitched today as net-positive. Agroecology, sustainable intensification, and conservation, regenerative, organic, and climate-smart agriculture, are a few examples.

produce net-positive outcomes for nature and smallholders."

The complete analysis will arm partner organizations like UNEP with the information needed to pursue policies that boost net-positive agriculture in Asia, Africa, and Latin America.

Be positive

This work is part of a global effort to understand and implement much-needed changes in food systems. Much of today's agriculture is unsustainable, as evidenced by stagnant yields, poor soils, conflict related to water resources (much of which is polluted by agriculture), biodiversity loss, and widespread food and nutritional insecurity.

But there are reasons for optimism. The extent to which food production suffers from – and contributes to – the global climate crisis is better understood today than even just a few years ago.

> **"The project will provide tangible information for smallholder farmers, governments, and investors to understand and better implement net-positive agricultural practices. We want to focus on practices, not concepts, and demonstrate what actions can produce net-positive outcomes for nature and smallholders."**
>
> **Carlo Fadda, leader of the Nature-Positive Solutions Initiative and the Agrobiodiversity research area of the Alliance of Bioversity International and CIAT**

"The project will provide tangible information for smallholder farmers, governments, and investors to understand and better implement net-positive agriculture practices," explains Carlo Fadda, an Alliance of Bioverwity International and CIAT researcher and leader of the Nature-Positive Solutions Initiative. "We want to focus on practices, not concepts, and demonstrate what actions can

The first United Nations Food Systems Summit in 2021 showed there is global support for making agriculture less of a burden on nature while improving food security and nutrition.

The Nature-Positive Solutions analysis will show where there is strong evidence that a particular practice is net-positive. Preliminary results show that, for example, no-till farming provides cascading benefits that start with improved soil quality and can lead to increased production, food security, and financial gains for farmers.

The analysis will also help debunk myths related to upending the status quo in agriculture. One example is the view that increasing crop diversity leads to decreased yields when evidence shows this is not always true.

Other practices still need to point to overall wins, but this isn't necessarily because the practices don't work. A lack of evidence points to the need for more research to fill knowledge gaps or to properly understand why, and under what contexts, a practice labeled "sustainable intensification," for example, might have undesirable tradeoffs. Understanding the downside of any net-positive intervention will be critical as implementation increases in the coming years.

Positive outcomes

Through the exploration of almost 10,000 research articles, 20 of the most common practices that can be considered nature-positive, climate-negative (meaning the activity does not contribute to exasperating climate change or may mitigate it through increased on-farm greenhouse gas capture) and pollution-free solutions will be analyzed.

Expected results include an easy-to-use table that lists different practices and the confidence that the current evidence points to the pillars of net-positive agriculture, including the three listed above (nature-positive, climate-negative and pollution-free) and several elements related to farmer well-being.

The table will provide guidance on what agricultural practices are to be avoided or can be used in a complementary fashion. It will also grade agricultural practices, ranging from "high agreement" resulting from high-quality evidence to "unresolved" regarding the scientific consensus and quality evidence.

The analysis will outline limitations on implementation of sustainable agricultural practices faced by farmers and others in the food system. It will help policymakers understand potential hurdles to implementation and develop strategies to address these. Finally, the analysis will produce several narratives related to the evidence that supports or contests the net-positive credentials of each practice.

"The value of this information is hard to understate," says Fadda. "With increased clarity on what types of agricultural activities are best for nature, the climate, nutrition, and food security for the most vulnerable, the Alliance and its partners can implement actions that will provide multiple benefits even in the face of increasing climate and social challenges."

LINKS TO IMPACT AREAS

Primary Impact Area:

Other relevant Impact Area(s):
None

GEOGRAPHIC SCOPE

Region(s): Global

KEY CONTRIBUTORS

Contributing Initiative(s): Nature-Positive Solutions
Contributing Center(s): Primary: Alliance of Bioversity International and CIAT — CIAT Regional Hub Contributing Centres: AfricaRice, CIMMYT, CIP, ICARDA, ICRISAT, IITA, ILRI, IRRI
Contributing external partner(s): United Nations Environment Programme (UNEP)

LINK TO CGIAR RESEARCH PROGRAMS

None

Annex 1

Stock-taking foundational evidence for 'Biodiversity Friendly, Climate Resilient and, Pollution Free' agriculture across scales. Preliminary results - report January 2023

We would like to thank all funders who supported this research through their contributions to the CGIAR Trust Fund.

COVER PHOTO: Lebanon 9
Photo credit: R. Ziade/ICARDA.