NATURE+: Nature-positive Solutions for Shifting Agrifood Systems to More Resilient and Sustainable Pathways

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Proposal

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Initiative name	NATURE+: Nature-positive Solutions for Shifting Agrifood Systems to More Resilient and Sustainable Pathways
Primary Action Area	Resilient Agrifood Systems
Geographic scope	Burkina Faso, Colombia, India, Kenya and Vietnam
Budget	US$25.1 million

1. General information

- Initiative name: NATURE+: Nature-positive Solutions for Shifting Agrifood Systems to More Resilient and Sustainable Pathways
- Primary CGIAR Action Area: Resilient Agrifood System
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2. Context

2.1 Challenge statement

The eyes of the world are on **Nature-Positive Solutions** (NPS). In prioritizing the mass-scale production of cheap and plentiful food, **industrial agriculture** has inflicted a disastrous cost on both the environment and humans. In terms of its **impact on nature**, industrial agriculture drives 80% of deforestation, threatens 86% of the 28,000 species currently at risk of extinction (through habitat conversion and pollution), is responsible for significant loss of crop and genetic diversity and up to 37% of global greenhouse gas emissions (GHGE), accelerates land degradation and land-use change, and uses 70% of global water resources withdrawn. In terms of its **impact on humans**, the homogenization of our food sources and diets has resulted in dramatically reduced (a) nutrition outcomes for families, particularly for women and children, and (b) farming incomes due to impoverished soil and water health, reduced crop resistance to pests and diseases, and poor waste management, which have collectively reduced the resilience of smallholder farming systems (Figure 1).

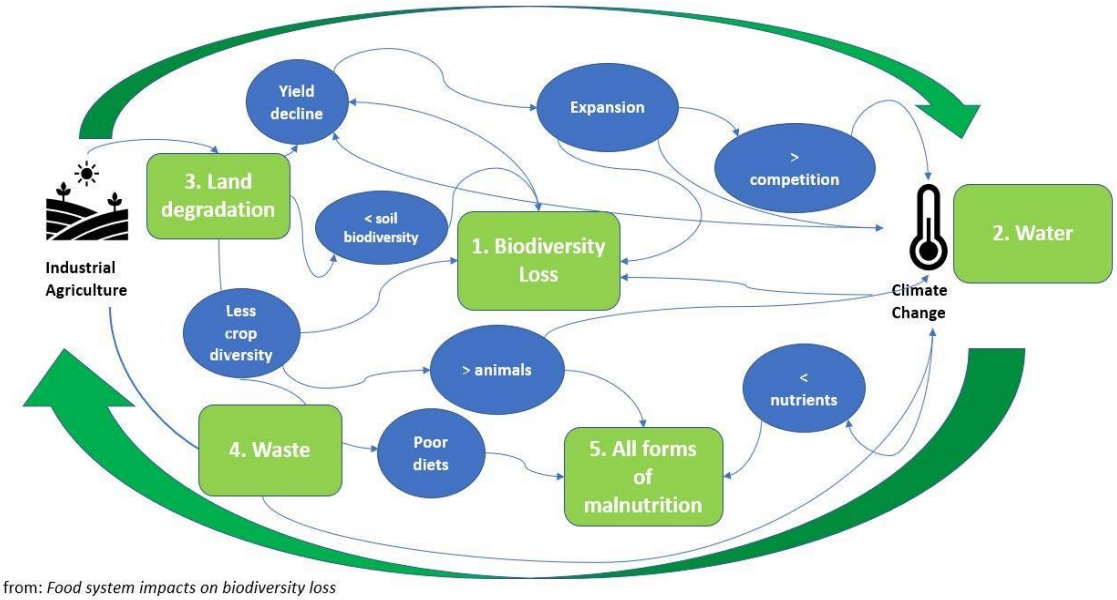
The circularity of these problems is exacerbated by misaligned public policies and economic incentives that incentivize production of the cheapest food possible, at the (long-term) cost of both nature and humans. Not accounting for the true cost of food in AFS makes it challenging for public and private sector actors to design incentives and investments that encourage smallholder farmers to shift to NPS-based pathways on-farm, with the result that smallholders continue to be pushed towards adoption of agricultural practices more suited to industrial systems.

Recently, however, there has been a seismic shift in thinking on how to (re)organize our agricultural production systems, partly prompted by the structural fault lines and vulnerabilities of industrial agriculture laid bare by the COVID-19 pandemic, and partly by formal recognition by the 2021 UN Food Systems Summit (UNFSS) that nature-positive production (NPP) is one of five critical pathways to sustainable food systems. This momentum was sustained by 92 governments and 95 high-profile corporations pledging urgent action and investment at UKCOP26 to protect nature, pursue nature-positive pathways, and shift to more sustainable ways of farming.

While much of the business case for NPS is in place — the 2020 World Economic Forum's "The Future of Nature and Business Report" suggests that NPS-focused stimulus packages could enable people to tap into an estimated *395 million new NPS-driven jobs* by 2030 — the actionable science (evidence and tools) required to support NPS planning by the agricultural research for development (AR4D) community lags behind. Herein lies the challenge.

The CGIAR is uniquely well-placed to play a leading role in NPS development, thanks to its many decades of research and thought leadership in this very arena. However, gaps between

research and impact at scale remain. The next three years represent a critical opportunity for CGIAR to expand its partnerships with conservation and other downstream AR4D partners and together take the lead on stress-testing, packaging, and scaling NPS best practices in forms (technologies, innovations, tools) that can help smallholder farming communities shift towards producing food in a nature-positive way. NATURE+ will produce actionable science that enables the CGIAR and broader AR4D ecosystem to plan for nature-positive agricultural interventions that **promote productivity in parallel with ZERO biodiversity loss, ZERO deforestation, ZERO land degradation, MINIMAL carbon and water footprint, ENHANCED water- and nutrient-cycle management, and ENHANCED equity outcomes.**



Modified from: *Food system impacts on biodiversity loss*

Figure 1. Current industrial food systems

2.2 Measurable 3-year (end-of-Initiative) outcomes

NATURE+ (Figure 2) adopts a **stepwise approach** to achieving outcomes, based on what we know to be realistic over the initial three-year period (2022–2025) and in the longer-term (2025–2030):

EOI Outcome 1: Women and men smallholder farmers, local communities, and NARES in five LMICs use NPS stress-tested and validated by NATURE+ to improve landscape-scale management of biodiversity for food and agriculture (BFA) via the farmscale entry points of water, soil, waste, and land restoration.

EOI Outcome 2: Women and men (incl. smallholder farmers) in five LMICs use NATURE+ 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 Outcome 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 (2022–2025), to be followed by (in the 2025–2030 cycle) NARS entrenching best practices in participatory, multi-disciplinary research as a systemic norm.

EOI Outcome 4: National and subnational policymakers in five LMICs acknowledge that true cost accounting should and will be applied to AFS-related policy formation (2022–2025), followed by realignment of economic incentive schemes and policy by policy actors to account for the true cost of food (2025–2030).

EOI Outcome 5: Public and private investment actors use NATURE+ evidence, tools, and methodologies to gain a better understanding of the business case for NPS (2022–2025), to be followed (in the 2025–2030 cycle) by investment actors being assisted to reorient investment streams towards participatory action research (PAR), innovation development, piloting, and scaling of NPS (biodiversity, waste, water, and soil).

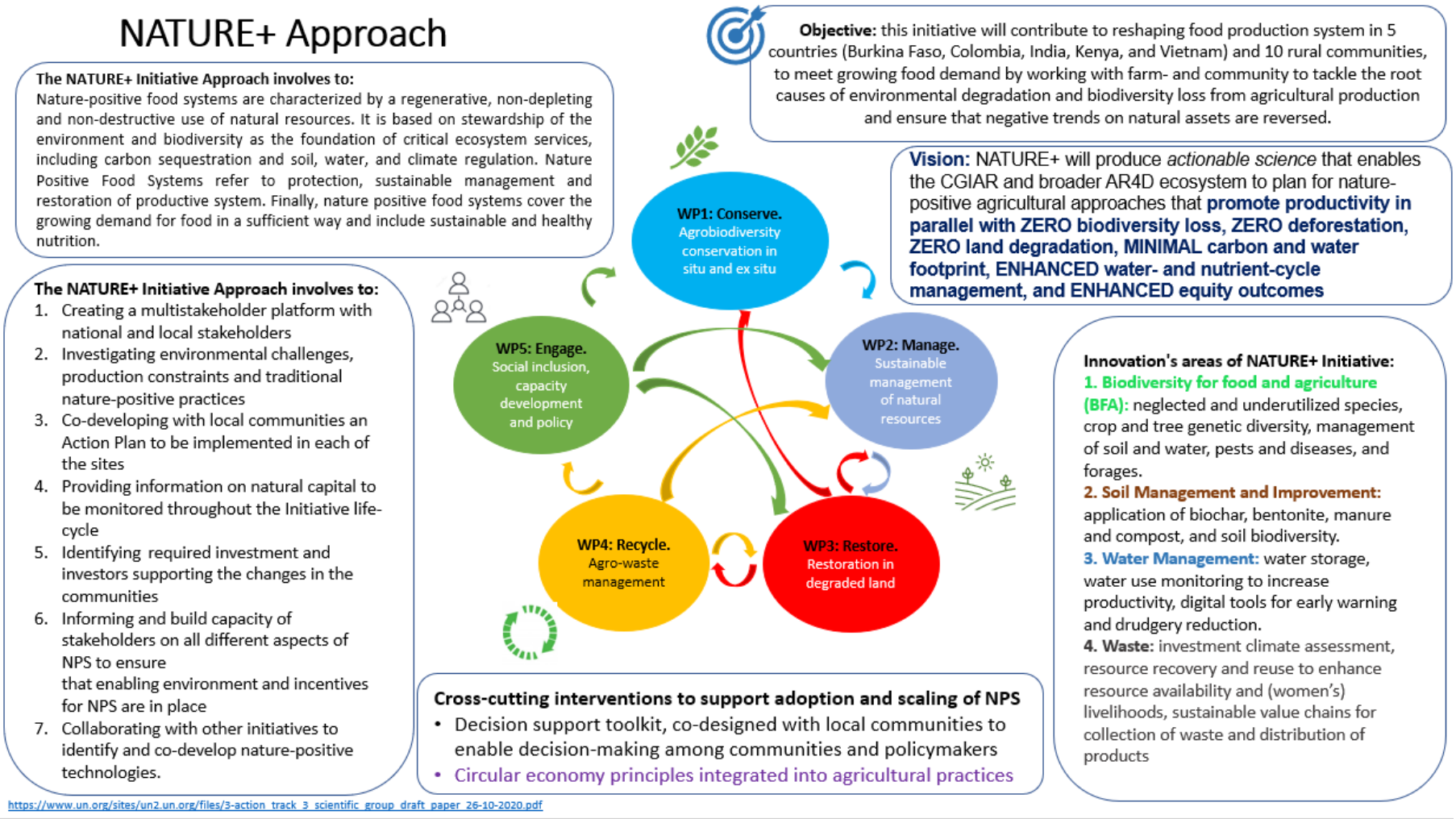


Figure 2. The NATURE+ concept.

2.3 Learning from prior evaluations and impact assessments (IA)

- CGIAR Synthesis Learning briefs (System Transformation and Resilient Agrifood Systems) called for more significant attention to the interconnected relationships between the environment, ecosystems, biodiversity, and livelihoods in agro-ecosystems. NATURE+ targets high priority agroecologies, where the triple challenge of achieving sustainable food production, enhancing human well-being, and conserving ecosystem services can be addressed simultaneously.
- The Reports also identified that (a) Water, Land, and Ecosystems (WLE) was effective because it had engaged with diverse stakeholders to build mutual understanding and agree on potential options to manage landscapes (NATURE+ adopts a similar 'ground-up' approach); (b) for most CGIAR CRPs, last-mile adoption was often lacking (NATURE+ addresses this by focusing less on traditional measures of research success and more on harder-to-quantify measures such as AFS resilience and capacity development); and (c) CGIAR research was often not oriented towards the vulnerable poor living in climate-stressed environments (NATURE+ focuses on solutions that deliver a range of livelihood, social equity, and ecological co-benefits).
- UNEP/Chatham House, FAO, IPCC, IPBES, IUCN, WWF, TNC/FAO, WRI, Biovision, World Economic Forum, WBCSD, and EAT/Lancet have all emphasized the importance of NPS
- Both the TEEB and Dasgupta reports highlight the importance of making the cost-to-nature of production patterns more visible. While NPS is a relatively new area of study, impact studies on distinct elements of it already exist, including studies on the importance of diversification for food and nutrition security, the potential to improve livelihoods using neglected and underutilized species, especially in marginal and water-scarce environments, and approaches such as community seed banks and waste management as a key element for circular economy and as an input for nature-positive agriculture.

2.4 Priority-setting

2021 has seen momentum build behind NPS. Ninety-two governments and over 90 high-level corporations pledged urgent action and investment at UKCOP26 to protect nature, pursue nature-positive pathways, and support the shift to more sustainable ways of farming. NATURE+ is designed to generate the evidence, science, and tools to empower AFS in five LMICs to start doing just that.

The FCDO/CCAFS-led UK COP26 Nature Campaign 'Transforming Agriculture Innovation Systems for People, Nature and Climate' criticized governments for allocating only 6% of the US$708 billion annual spending on agriculture on climate mitigation and adaptation, or conservation and biodiversity. NATURE+ responds to their challenge for countries and research systems to (a) showcase business models and public-private partnerships that deliver climate-resilient and nature-positive outcomes, and (b) share knowledge of — and build consensus around — the evidence on innovations that can be delivered at scale.

NATURE+ design also responds to the first of three pathways towards resilient AFS agreed upon at the **UN Food Systems 'Pre-Summit'** side-event[3] jointly organized by CCAFS, FCDO, SACAU, the World Resources Institute (WRI) and the World Economic Forum (WEF), namely

ensuring that food is produced, transported, processed, sold, and consumed in a **nature-positive way.**

The NATURE+ Initiative Design Team (IDT) has been actively involved in many of these discussions and has therefore contributed to shaping the NPS agenda. NATURE+ Work Package (WP) design is the direct result of leadership involvement in key UNFSS workstreams and consultations during both the pre-summit and the summit itself. For example, the three key areas of intervention — conserve, manage and restore — defined in the UNFSS document are mirrored in the WPs, while some of the game changers, i.e., agrobiodiversity, are an integral part of our innovations. The summit, together with other relevant global initiatives, such as COP26 on climate change and COP15 for the CBD (in which IDT leadership is also involved at strategic levels), helped shape the development of Initiative indicators related to the nexus between food systems and biodiversity.

Priority-setting was further guided by:

(a) **In-depth consultations and co-design with 150+ different research, innovation, demand, and scaling partners** (government ministries, NGOs, international organizations, research institutes) rooted in our five target LMICs, such as the Fédération Nationale des Sociétés Coopératives des Éleveurs du Burkina Faso (National Federation of Cooperative Breeders Societies of Burkina Faso), Conservation International (CI), Kenya Agriculture and Livestock Research Organization (KALRO), and the Department of Agriculture, Cooperation & Farmers Welfare (DAC&FW) of India. These consultations helped us to narrow down the specific challenges to be addressed in each country, as well as the priority development streams, and potential NPS existing in-country that NATURE+ could build on, and;

(b) **Analysis of the various NPS-relevant innovations developed by CGIAR and its AR4D ecosystem partnerships** over the past few years (Annex 1). NATURE+ validated a list of the most promising NPS-related innovations and technologies via the regional consultation process.

NATURE+ prioritized country selection by commissioning a study on key aspects of NPS in those countries (Annex 2). Using pre-agreed selection criteria (such as biodiversity status, opportunities for scaling, climate challenges, poverty, political will), the IDT produced a shortlist that aggregated member scores. If further funding becomes available, NATURE+ is interested in expanding its geographic focus to include countries in the Central Asia and the Congo Basin regions, both of which are biodiversity hotspots facing similar challenges to the Initiative's selected countries.

2.5 Comparative advantage

Our innovations build on over a decade of robust WLE, CCAFS, FTA, RTB, Livestock, GLDC research. A systematic review of CGIAR NPS-relevant innovations identified a number of innovations that can be deployed quickly and cost-effectively with partners on the ground in the first cycle (2022–2025), enabling us to quickly learn what is effective and what is not for the local farming communities in our target countries.

A key comparative advantage that CGIAR brings into play with NATURE+ is our long history of participatory, multi-sectoral approaches to research. We will build on this by conducting research that combines technical learning with the indigenous knowledge gathered over time by smallholder farmers. The result will be **NPS innovations**, which combine the benefit of rigorous evidence, tools, and methods with the local knowledge that local farmers and AFS actors contribute to make the science relevant, context-appropriate and, above all, more likely to be adopted.

Working through multistakeholder platforms — which the Initiative will guide through practical tools and guidelines to help with the planning of collaborative action, adaptative management, and platform evaluation — is an efficient way to manage this type of intervention, because they enable us to address issues in an integrated manner, rather than in silos (as previously). The Initiative's partnership with conservation organizations such as UNEP, WWF, and FOLU will also be a unique comparative advantage - most conservation-focused efforts depend on their active role. They bring a unique, nature-focused perspective to our treatment of agricultural production systems, as well as measurement, reporting, and verification (MRV) capacity that will be folded into our monitoring of Initiative impact on biodiversity, a critical factor to monitor wherever there are efforts to integrate production and conservation objectives.

2.6 Participatory design process

The Initiative design process was led by an IDT team comprising scientific experts from different fields (both CGIAR and conservation organizations) and other key actors representing research institutions, NGOs, and uptake partners that are active along the value chains of AFS in Africa, Asia and Latin America.

A preliminary list of 13 target countries was established taking into account the intensity of the issues described in the challenge statement (Section 2.1) as well as the possible synergies with ongoing global and regional programs. However, the final selection of the five target countries (Burkina Faso, Colombia, India, Kenya, and Vietnam) and the preliminary Initiative concept framing were informed by country reports commissioned from in-country consultants (Annex 2) and subsequently reviewed by the IDT. Additional inputs were obtained by engaging relevant potential partners, including IFAD, FAO, ITPGRFA, Crop Trust, World Economic Forum, Wageningen University, UCLA, IUCN, and other relevant (local) organizations to whom the Initiative was presented to seek additional inputs and explore opportunities for partnership.

The in-country identification of the communities for implementation of the Initiative was conducted in concert with the aforementioned local and partner organizations. The main selection criteria were the existence of ongoing programs and activities aligned with NPS and implemented by CGIAR, local and international partners, the synergies with national development plans and programs, the demand from local communities, and the potential to achieve significant NPS impacts. However, selected countries have requested the opportunity to review and validate the community selection one last time during the inception phase.

Together with the CGIAR country and regional offices and Initiative Partners, the IDT supported the organization of stakeholder consultations (Annex 3) in the Initiative's five target countries. The specific objectives of the consultations were: (i) inform local partners and target communities about the Initiative concept and validate their interest; (ii) identify priority issues around agrobiodiversity, water, soil, and waste management to be addressed through the NATURE+ Initiative, and use the areas identified to formulate research questions to be addressed under the

Initiative WPs, thereby ensuring alignment of the Initiative proposal with local demand; and (iii) identify additional potential partners and learn more about ongoing projects, initiatives, and stakeholder platforms that offer an opportunity for future collaboration. The stakeholder consultations were organized in the language of the country to facilitate participation and inputs.

These consultations reached over 150 stakeholders, including national institutions (e.g., ministry representatives), universities, NGOs, CBOs, private actors (e.g., small business representatives), and international organizations with strong local presence. They all indicated the relevance of the Initiative concept, congratulating the One CGIAR for including an Initiative on NPS in the new business plan.

In particular, the stakeholders affirmed their support for interventions that support the development of a better knowledge and documentation of natural resources (including agrobiodiversity, water, and soils (**WP1**) and the building of capacity in AFS stakeholders to deploy them effectively in production or recycling processes (**WP1, WP2** and **WP4**). At the same time, they highlighted the need for an enabling policy and social environment that brings together different actors and triggers a behavioral change for broader cooperation towards more sustainable practices (**WP3** and **WP5**).

2.7 Projection of benefits

The projections below transparently estimate reasonable orders of magnitude for impacts that could arise as a result of the impact pathways set out in the Initiative's theories of change (TOC). Initiatives contribute to these impact pathways, along with other partners and stakeholders.

For each Impact Area, projections consider breadth (numbers reached), depth (expected intensity of effect per unit) and probability (a qualitative judgement reflecting the overall degree of certainty or uncertainty that the impact pathway will lead to the projected order of magnitude of impact).

Projections will be updated during delivery to help inform iterative, evidence-driven, dynamic management by Initiatives as they maximize their potential contribution to impact. Projected benefits are not delivery targets, as impact itself lies beyond CGIAR's sphere of control or influence.

For this exercise, seven impact indicators were selected from CGIAR's PRMF full list (available here), according to their relevance to NATURE+ TOC. The contextual data and evidence required for the calculations of projected benefits (PBs) was provided by our target-country focal points and supplemented by the literature (Annex 4 and Annex 5).

Considering that the results of NPS co-creation processes are unknown at this stage, NATURE+ PBs focuses on following general aspects of its TOC: NPS' impact on smallholder household farm incomes, and on gender equality and inclusion will be realized through the co-creation of adapted NPS adopted at the farm level, the upgrading of value chains, and the strengthening of market linkages for the diverse products/services it will help generate in the prioritized sites. NATURE+ will also contribute to a broader scaling of such solutions, i.e., beyond the prioritized sites, through institutional arrangements, capacity building, policy recommendations, multi-stakeholder platforms, and innovative financial instruments. These PBs thus rely on the assumption that NPS will (i) *directly benefit* smallholder farming households who that will start adopting nature-based solutions in the priority sites in 2023; and (ii) *indirectly benefit* similar households that start

adopting such practices in other parts of each selected country in 2025, i.e., after the Initiative's first three years of implementation (see Section 6.1).

Our PBs are conservative for the following reasons:

1) They only account for potential socio-economic impacts realized by smallholder farmers through the adoption of co-created nature-positive management solutions at the farm level (i.e., directly in the prioritized sites and indirectly in the rest of the country), thus neglecting other agrifood system actors (e.g., consumers, agri-businesses, and value chain intermediaries) who will also benefit from NPS through e.g., data-driven tools that support business models and institutional innovations that promote the generation of inclusive jobs.
2) They only account for positive environmental impacts generated in the hectares of agricultural land improved with NPS by the above-mentioned smallholder beneficiaries, thus neglecting the environmental benefits that will additionally be derived through the adoption of NPS along the corresponding value chains.
3) They omit synergies with other initiatives (e.g., Transformational Agroecology across Food, Land, and Water Systems) that are expected to expand NPS' benefits and reach.

Nutrition, health and food security, and poverty reduction, livelihoods and jobs
Indicators: #people and #poor people benefiting from relevant CGIAR innovations

Breadth: Our projections for these two Impact Areas reflect the permanent impacts on smallholder households, and by extension of all their constituent members, which can potentially be realized through the adoption of NPS at the farm level. Using data on the number of smallholder households (harvested from each selected country's available census data) and corresponding household sizes in the priority sites (and that data relevant to similar households in the rest of the country), we calculated the current share of HH members (i.e., number of potential beneficiary households multiplied by relevant rural HH size) in each selected country's current total rural population. We subsequently estimated the annual development of both smallholder family member groups during the period between 2021 and 2030, by applying this calculation to each country's UN rural population prospects[1] data series (see Annex 4). The projected beneficiaries were then calculated by multiplying each year's projected smallholder population group with assumed NPS adoption rates. The adoption rates assumed for the population of direct beneficiaries in the priority sites were obtained from proxy best-management practices (e.g., conservation agriculture) reported in the literature, or provided by local experts. The corresponding adoption percentage points were first distributed at a linearly increasing rate throughout the projected period, before applying them to the population of potential direct beneficiaries. On the other hand, the annual population of indirect beneficiaries (i.e., all other similar smallholders in each country adopting NPS practices beyond the priority site boundaries) were multiplied each year (from 2025 on) by an assumed 1% adoption rate that we considered conservative.

Depth: For each country, we assessed the potential net farm income increase that may be realized by smallholders through the adoption of NPS, using as proxies the productivity and/or income increases that have been reported in the literature for smallholders adopting best management practices in similar contexts (Annex 4). We rounded the percentage points from the reported farm income improvements down to the nearest and least multiple of 10 (e.g., from 60% to 50%). The assumed income improvements were used to assign impact depth to each country's projected

[1] United Nations, Department of Economic and Social Affairs, Population Division (2018). World Urbanization Prospects: The 2018 Revision, custom data acquired via website.

number of direct and beneficiaries (e.g., substantial: 50% permanent impact on income), considering that one would expect no difference in income impacts between these two beneficiary groups under the assumption that they will adopt similar NPS solutions under comparable agroecological circumstances.

Gender equality, youth and social inclusion
Indicators: #women and #youth benefiting from relevant CGIAR Innovations

Breadth: We used UN annual prospects (i.e., between the ages of 15 and 24) populations to calculate the share of women and youth[1] (i.e., between the ages of 15 and 24) in the total population of each country, and subsequently applied those shares to the projected number of NPS-adopting smallholder household members.

Depth: The depth category for youth was assigned to be consistent with the expected income improvements for which we assigned depth to the Impact Areas above. NPS will benefit women, youth, indigenous peoples, and other disadvantaged groups through job creation and through a greater control of resources (e.g., as actors in the value chains) linked to income diversification options and/or improved productivity. We assigned the transformative depth category to the total number of women benefitting from NPS, as our TOC mainstreams gender equality through greater participation and inclusion in all relevant activities.

Environmental health and biodiversity
Indicators: #ha under improved management and #ha of deforestation

Breadth: Assuming that the number of NPS-adopting smallholder households corresponds to the respective number of farming units, for each country we applied conservative adoption and agricultural land conversion rates drawn from the literature (obtained from the literature or from local experts — Annex 4) to calculate the lower-bound number of hectares that will be improved through co-created NPS solutions in the priority sites and throughout the country. The resulting converted land extension corresponds to the #ha under improved management indicator and also served as the base for the projection of NPS' potential contribution to #ha of restored forest, as it was multiplied with conversion rates of cultivated land to tree-based systems. This conversion rate is estimated to be relatively high (i.e., 50%) for Vietnam, as this country's exceptional capacity for agroforestry can in particular be realized through the region's high potential for fruit tree agroforestry.

Depth: The technological NPS that will be co-created in each site can be largely classified either under *conservation agriculture* or *restoration*. Although there are other aspects of the Initiative that will significantly contribute to environmental health and biodiversity improvements — among others, through a low water footprint and reduced pollution, agro-waste management, fallow land, field margins and buffer strips — such benefits could not be projected here due to the difficulty they posed when searching for reliable contextual evidence. Notwithstanding, we assume that all hectares under NPS' improved management, both in the priority sites and beyond their boundaries, will deliver improved soil health and fertility, biodiversity gains, and additional ecosystem services, i.e., *transformative impact*. Furthermore, we used Hill et al.'s (2019)[2] forest biodiversity status classification (as mapped by the 'Global Forest Watch' partnership) to assign

[2] Hill et al. (2019). Measuring Forest Biodiversity Status and Changes Globally. Front. For. Glob. Change. https://doi.org/10.3389/ffgc.2019.00070

depth (i.e., substantial or significant) to the hectares of forest restored within the priority sites. Contrary to the classification by Hills et al. (2019), the substantial category was assigned to the extension of forest restored in Burkina Faso, as this country hosts significant biodiversity, and its National Biodiversity Strategy and Action Plan has stated its intention to increase the number of forests under some form of management (Ministère de l'Environnement et du Developpement Durable, 2011).

Climate adaptation and mitigation
Indicator: #tonnes CO2 equivalent emissions

Breadth: Although NATURE+ anticipates climate mitigation and adaptation benefits, among others, through waste recycling, we have only projected its contribution to reduced GHGEs in the priority sites and in the rest of the country through the soil organic carbon (SOC) sequestration potential of conservation agriculture (i.e., as a proxy for NPS practices) and through the above- and below-ground carbon sequestration potential of agroforestry. Accordingly, avoided #tonnes of CO2 eq emissions were estimated by multiplying potential per-hectare contributions of conservation agriculture and agroforestry in each country (i.e., as obtained from the literature) with the respective projected #ha under improved management. We did not project an impact on resilience and adaptation, given the uncertainties and dependence on very context-specific conditions involved in such calculations.

Assessing probability
We assigned medium certainty to the probability to all of NATURE+'s projected benefits to direct beneficiaries, considering (i) the cooperation experience and knowledge that the Initiative's partners have accumulated with the targeted communities and their attitude towards adoption of NPS solutions, which in many cases has proven very positive; (ii) the enabling environment at national and local government level (including its system of incentives), as well as the extension systems' strength and the protocols they promote, which are currently not very supportive (although we do not have this information for all locations at this juncture). However, one of NATURE+ important interventions will be removing such bottlenecks at the local level. As regards to NATURE+'s indirect beneficiaries, we conservatively assigned a low certainty to balance contextual uncertainties regarding the possibility of adopting NPS outside the target areas.

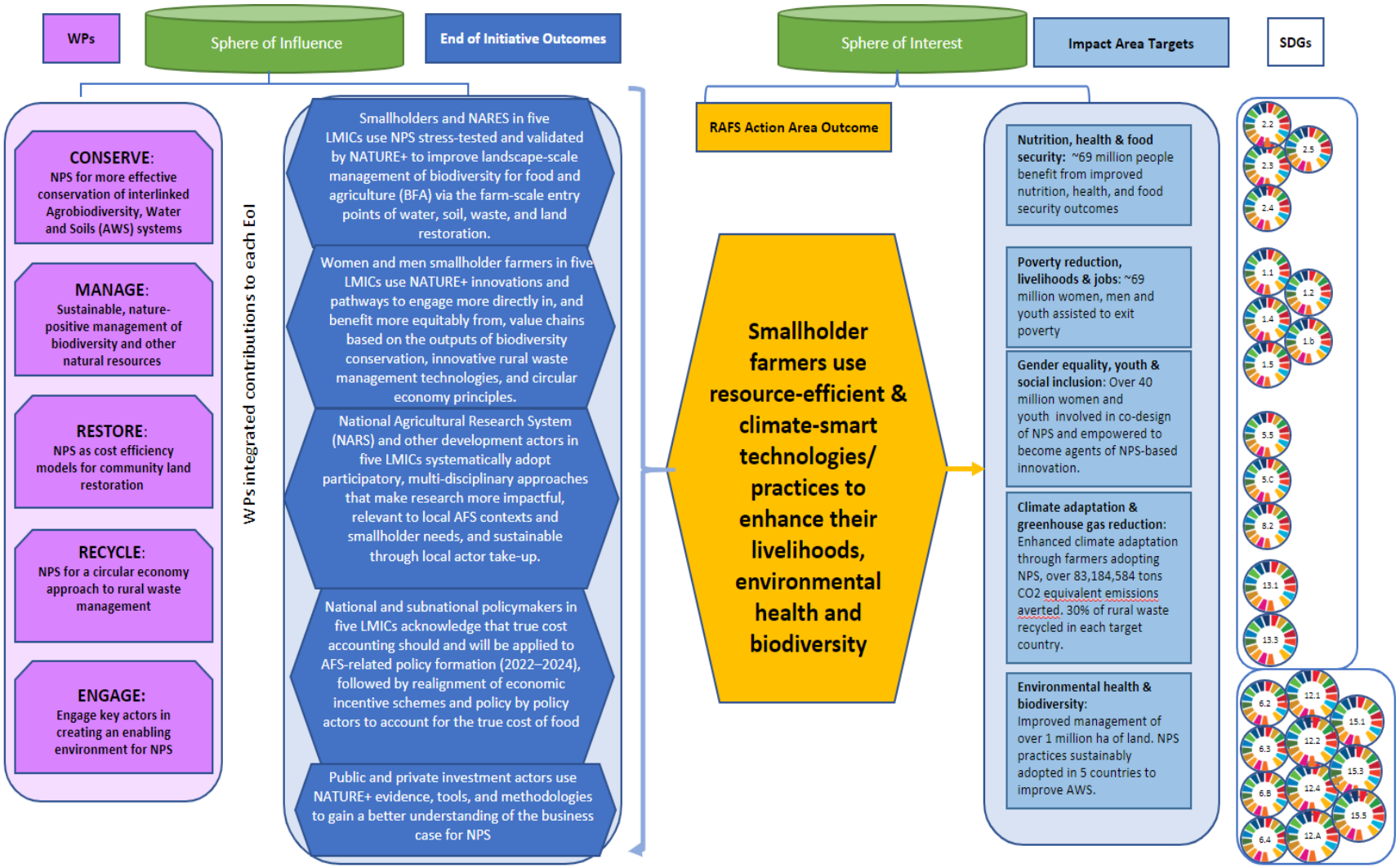
Breadth	Depth	Probability
(Nutrition, health & food security): Total: 69,022,653 people benefiting from relevant CGIAR Innovations. Direct beneficiaries: 27,823,313 Indirect beneficiaries: 41,199,340	**Significant impact: ~66m people** We expect around 66m people to experience a significant impact, with permanent increases in income of between 15% and 50%. **Substantial impact: 2,885,651** We expect 2,885,651 people to experience a substantial impact, with permanent increases in income of >50%.	We expect **direct beneficiaries (27,823,313** people) to be impacted with *medium* certainty (30% - 50%) We expect **indirect beneficiaries (41,199,340** people) to be impacted with *low* certainty (10% - 30%).
(Poverty reduction, livelihoods & jobs) Total: 69,022,653 people benefiting from relevant CGIAR Innovations Direct beneficiaries: 27,823,313 Indirect beneficiaries: 41,199,340	**Significant impact: ~66m people** We expect around 66m people to experience a significant impact, with permanent increases in income of between 15% and 50%. **Substantial impact: 2,885,651**	We expect **direct beneficiaries (27,823,313** people) to be impacted with *medium* certainty (30% - 50%) We expect i**ndirect beneficiaries (41,199,340** people) to be impacted with *low* certainty (10% - 30%).

	We expect 2,885,651 people to experience a substantial impact, with permanent increases in income of >50%.	
(Gender equality, youth & social inclusion): Total: 33,316,617 women benefiting from relevant CGIAR Innovations Direct beneficiaries: 13,407,564 Indirect beneficiaries: 19,909,053	**Transformative**	We expect **direct beneficiaries (13,407,564** wom**e**n) to be impacted with *medium* certainty (30% - 50%) We expect **indirect beneficiaries (19,909,053 women)** to be impacted with *low* certainty (10% - 30%).
(Gender equality, youth & social inclusion): Total: 11,560,655 youth benefiting from relevant CGIAR Innovations Direct beneficiaries: 4,654,677 Indirect beneficiaries: 6,905,978	**Significant Impact: 11m people** We expect around 11m to experience a significant income impact. **Substantial Impact: ~598,923** and around 598,923 to experience a **substantial** impact.	We expect **direct beneficiaries (4,654,677 youth)** to be impacted with *medium* certainty (30% - 50%) We expect **indirect beneficiaries (6,905,978 youth)** to be impacted with low certainty (10% - 30%).
(Climate adaptation & mitigation): Total: 83,184,584 tonnes CO2 equivalent emissions Averted Of which from direct beneficiaries: 30,828,581 Of which from indirect beneficiaries: 52,356,003	n/a	Through indirect beneficiaries we expect **52,356,003 tonnes CO2 equivalent emissions averted** with low certainty (10% - 30%). Through direct beneficiaries we expect **30,828,581 tonnes CO2 equivalent emissions averted** with medium certainty (30% - 50%).
(Environmental health & biodiversity): Total: 916,005 ha deforestation averted/restored Of which from direct beneficiaries: 348,879 Of which from indirect beneficiaries: 567,125	**Significant impact:** 764,047 ha We expect a **significant** impact on 764,047 ha. **Substantial impact:** 151,957 ha We expect a **substantial** impact on 151,957 ha.	Through direct beneficiaries we expect **348,879 ha of deforestation to be averted/restored** with *medium* certainty (30% - 50%). Through indirect beneficiaries we expect **567,125 ha of deforestation to be averted/restored** with *low* certainty (10% - 30%).
(Environmental health & biodiversity): Total: 1,821,038 ha under improved management Of which from direct beneficiaries: 710,132 Of which from indirect beneficiaries: 1,110,906	**Transformative**	Through direct beneficiaries we expect **1,821,038 ha under improved management** with medium certainty (30% - 50%). Through indirect beneficiaries we expect **1,110,906 ha under improved management** with *low* certainty (10% - 30%).

3. Research plans and associated theories of change (TOC)

3.1 Full Initiative TOC

3.1.1 Full Initiative TOC diagram



3.1.2 Full Initiative TOC narrative

Nature-positive production has been recognized by the UNFSS as one of five critical pathways towards sustainable food systems. Yet, there are not enough scientifically-supported solutions available to facilitate NPS mainstreaming at volume or scale — either in our research pathways or on the ground — in the smallholder agricultural systems that are expected to implement them. NATURE+ asks: How can we re-imagine, co-create, and implement NPS-based agrifood systems (AFS) that equitably support food and livelihoods on the ground, while simultaneously ensuring that agriculture is a net positive contributor to nature? Our **TOC** begins with the premise that the scope of ambition calls for *transformative change*, starting at farm and community-level, using on-farm waste, soil, water, and land restoration innovations as **entry points** to halt and reverse the **biodiversity** crisis at broader landscape level.

For NPS to emerge as a viable means by which to do this in LMICs, we must:

(A) work with smallholders, researchers, and AFS actors to identify or co-design and test waste, soil, water, and restoration tools and practices that (i) are practical and effective for smallholders to implement on-farm, (ii) can be equitably accessed and used by women and men smallholders, and (iii) have the potential, when scaled, to trigger positive changes to biodiversity levels at landscape scale,
(B) ensure that the true cost of food, including the hidden cost of women's labor, is accounted for in AFS planning,
(C) link women and men smallholder farmers and indigenous people more efficiently to the market, not only through global value chains but through more local ones for neglected and minor crops, strengthening rural entrepreneurship and capacity,
(D) ensure that traditional knowledge is folded into participatory research so that research systems and extension generate solutions that are context-specific and relevant to local community needs, and thus more likely to be adopted by smallholders, and
(E) ensure that farmers (especially women and youth) have access to, and can use, technologies (drones, sensors) to manage and monitor the effect of NPS on biodiversity, livelihoods, diets, and productivity.

NATURE+ WPs have been designed around these levers, based on the type of approach required, namely:

(WP1) Conserve: NPS for agrobiodiversity **conservation** (*in situ* and *ex situ*), soil and water,
(WP2) Manage: Sustainable, nature-positive **management of biodiversity** and other natural resources,
(WP3) Restore: NPS for **restoration** of degraded land, water and biodiversity,
(WP4) Recycle: NPS for **agro-waste** management, and
(WP5) Engage (cross-cutting): Fostering an **enabling environment** around NPS through enhanced social inclusion, capacity development, and policy.

These WPs and approaches are as highly interconnected (Figure 2) as the underlying problems they are designed to address. NATURE+ relies on these WP synergies, as well as on synergies with other Initiatives, such as Sustainable Intensification, Excellence in Agronomy, Plant Health, One Health, Resilient Cities, National Policies and Strategies, and gene banks, to achieve the **end-of-Initiative outcomes** (*Section 2.2*).
The TOC is underpinned by the assumptions that (A1) accounting for the true cost of food (including the hidden costs of under-valued natural capital and women's labor) will enable AFS decision-makers, especially governments, to correct and realign policies and incentives to

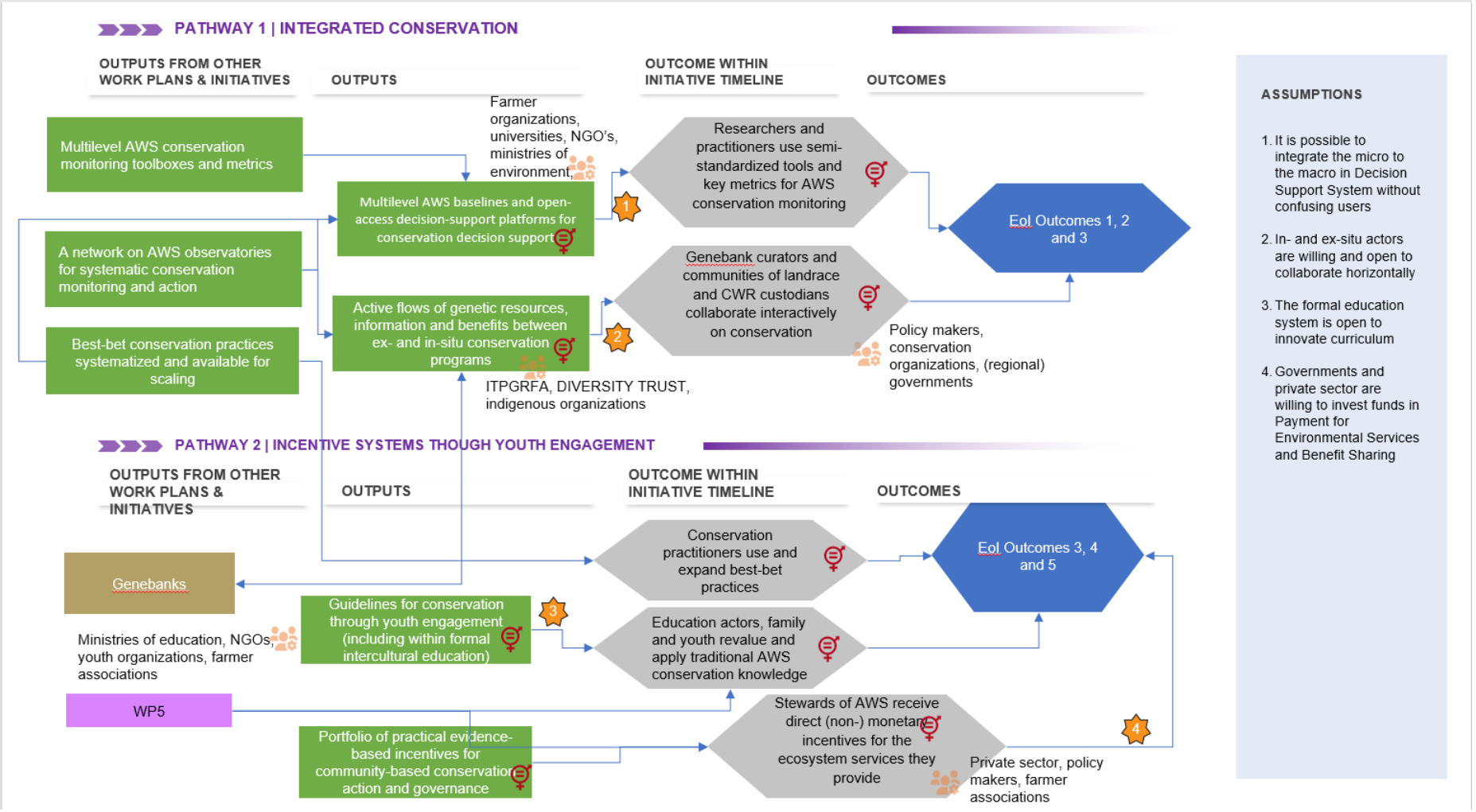
encourage growth in NPS uptake, (A2) integration of AWS and biodiversity conservation management workflows will maximize efficiencies in both, and (A3) the public pledges of national governments and global corporations at COP26 to shift AFS towards nature-positive pathways translates to political will and follow-on action in-country by key public and private stakeholders.

NATURE+ anticipates contributing to the targeted AA Outcome (*See TOC Diagram*), our targets under five **One CGIAR Impact Areas** (*Section 4*) and the **SDGs** (*Results Framework*).

The '**Big Lift'** that NPS expects to achieve — via the Initiative's shaping, testing, and evidencing of the optimal set of NPS (2022–2025) required in the long-term to contribute to transform AFS in five countries via scaling with downstream AR4D partnerships (2025–2030), supported by partnering Regional Initiatives — is: a **30% increase** in food, land, and water productivity, **at least 20% increased** income from NPS-focused value chains, reversal of soil degradation, and a **50% increase** in systems biodiversity, directly and indirectly benefiting **~69 million people by 2030**.

3.2 Work Package TOCs

3.2.1 Work Package 1 – Conserve



Work Package 1	**CONSERVE: NPS for more effective conservation of interlinked Agrobiodiversity, Water and Soils (AWS) systems**
Work Package main focus and prioritization	WP1 addresses the urgent **challenge of agrobiodiversity loss - also called genetic erosion - threatening the very basis of our AFS and vital soil and freshwater resources in keystone ecosystems** (wetlands, peatlands). In response to CGIAR Synthesis reports (Section 2.3) urging greater attention to be paid to the interconnected relationships between the environment, ecosystems, biodiversity, and livelihoods in agro-ecosystems, WP1 focuses on the nexus where agrobiodiversity conservation (*in situ*/on-farm) intersects with the water and soil resource management critical to halting and reversing biodiversity loss. WP1 will (a) link the different communities working on different parts of AWS more explicitly with conservation partners working on *in situ* /on-farm conservation and in gene banks, (b) create integrated conservation approaches that build on the golden eggs of CGIAR CRPs (e.g., on in situ conservation tools from CRP-RTB, among others), and (c) test ways to more effectively measure the effect of NPS on interlinked AWS and biodiversity conservation systems.
Work Package geographic scope (global/region/country)	WP1 action research will be implemented in two regions/counties/provinces per target core country (Burkina Faso (Centre-East and North Region), Colombia (Antioquia and Orinoquia), India (two states among Maharashtra, Rajasthan and Chhattisgarh/Madhya Pradesh), Kenya (two counties among Kisumu, Vihiga, Turkana, Narok and Kajiado), and Vietnam (two provinces among Son La, Dac Lac and aN Giang). However, site selection will be refined at the onset of the Initiative. Prioritized sites are available in Annex 6.

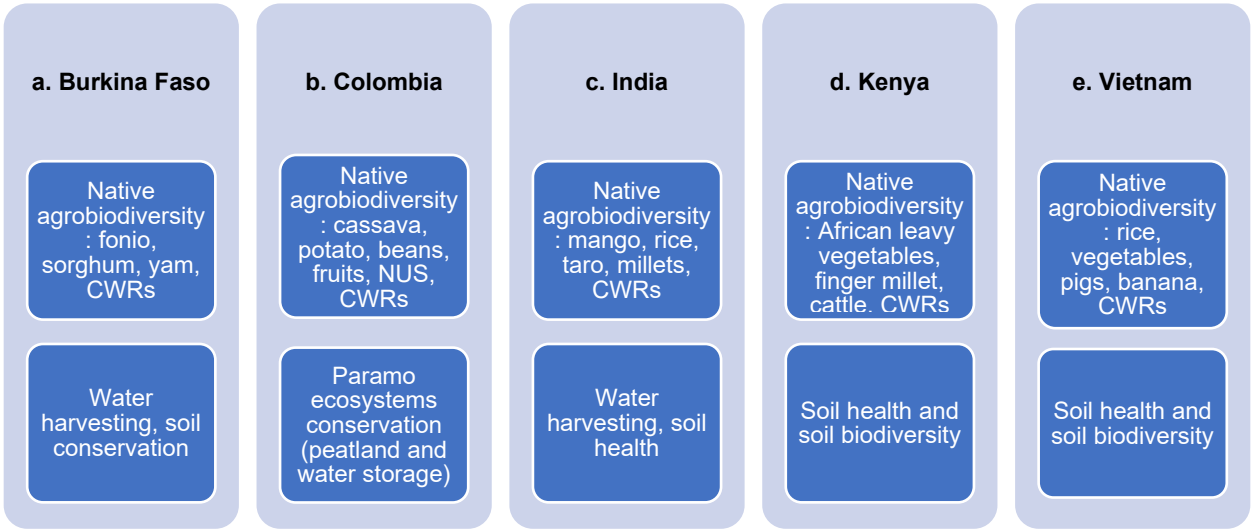


Figure 3. Priority conservation objects per target country – as identified during the stakeholder engagement process[3]

[3] NUS: neglected and under-utilized species. CWR:

WP1 Science narrative

Research questions	Associated scientific methods	Key outputs
How can the conservation status of Agrobiodiversity, Water & Soils (AWS), be systematically and coherently measured to track multilevel changes - from genes to landscapes – in space and time?	● Participatory research methods, citizen science, protocol development with robust sampling techniques, remote sensing of land use, water use and resources. ● Systematic monitoring at selected observatories to measure and track the impact of NPS interventions on AWS conservation. ● Hotspot mapping, modeling, and foresight based on robust common indicators. ● Multilevel baselining, landrace-level gap analysis, agrobiodiversity index, threat indices, AWS footprint analysis.	● Multilevel AWS baselines (catalogues, maps, inventories) and open-access decision-support platforms for conservation decision support of AWS. ● Multilevel AWS conservation monitoring toolboxes and metrics (from genes and soil health to watersheds and biodiversity hotspots). ● A network of AWS observatories for long-term conservation monitoring and action over time.
Can effective mutually beneficial links between (static) genebank conservation and (dynamic) *in-situ* conservation become integrated in such a way that it provides intelligence about gaps, coverage and change?	● Population genetics, population ecology, repatriation and incorporation schemes, horizontal evaluation. ● Characterization and trait mining for priority crops, including DNA fingerprinting, nutritional profile, agronomic performance, farmers' evaluation. ● Impact assessment (including participatory approaches), systematic practice-based reviews. ● Crop-climate modelling to assess impact of conservation interventions and different scenarios. ● Private benefit sharing scheme case studies.	● Active flows of genetic resources, information between *ex-* and *in-situ* conservation programs. ● Portfolio of practical evidence-based incentives for community-based conservation action and governance ● Best-bet AWS conservation practices systematized and available prioritized for upscaling in different contexts.
What are the social incentive and governance systems that drive AWS conservation between generations (elders and youth) and how can these be strengthened?	● Most significant change interviews, case study research. ● Ethnographic, knowledge network mapping. ● Payment for environmental services economics. ● Curriculum development with teachers, parents, elders and rural youth. ● Policy analysis.	● Portfolio of practical evidence-based incentives for community-based conservation action and governance. ● Guidelines for conservation through youth engagement (including within formal intercultural education)
Synergies ● WP1 will actively link with the CGIAR genebanks for integrated conservation (Figure 3) and work with youth as the future stewards of AWS.		

WP1 Theory of change narrative

Impact Pathway (IP) 1 of WP1 contributes to **end-of-Initiative outcomes 1, 2,** and **3**, while IP2 contributes to **3, 4 and 5** (See Section 2.2).

The WP1 TOC uses two interlinked IPs. **IP1** focuses on linking conservation monitoring to decision support systems and best-bet practices to produce more powerful, accurate, and real-time monitoring information about the conservation status of interlinked AWS and biodiversity conservation systems. More accurate intelligence will guide more effective conservation actions at landscape or regional scales by policy makers, genebank managers, and conservation practitioners. Decision makers, authorities, rural communities, and educators will use WP1 decision support tools and best-bet practices to shape more effective AWS conservation actions at farmscale. Smallholder farming communities will consequently change the way they conserve natural capital on-farm, and become more effective at conserving species, landraces, water

resources and soil carbon stocks. They will also learn to link conservation more effectively to use, thus building the natural resource base for both improved family diets and farming livelihoods.

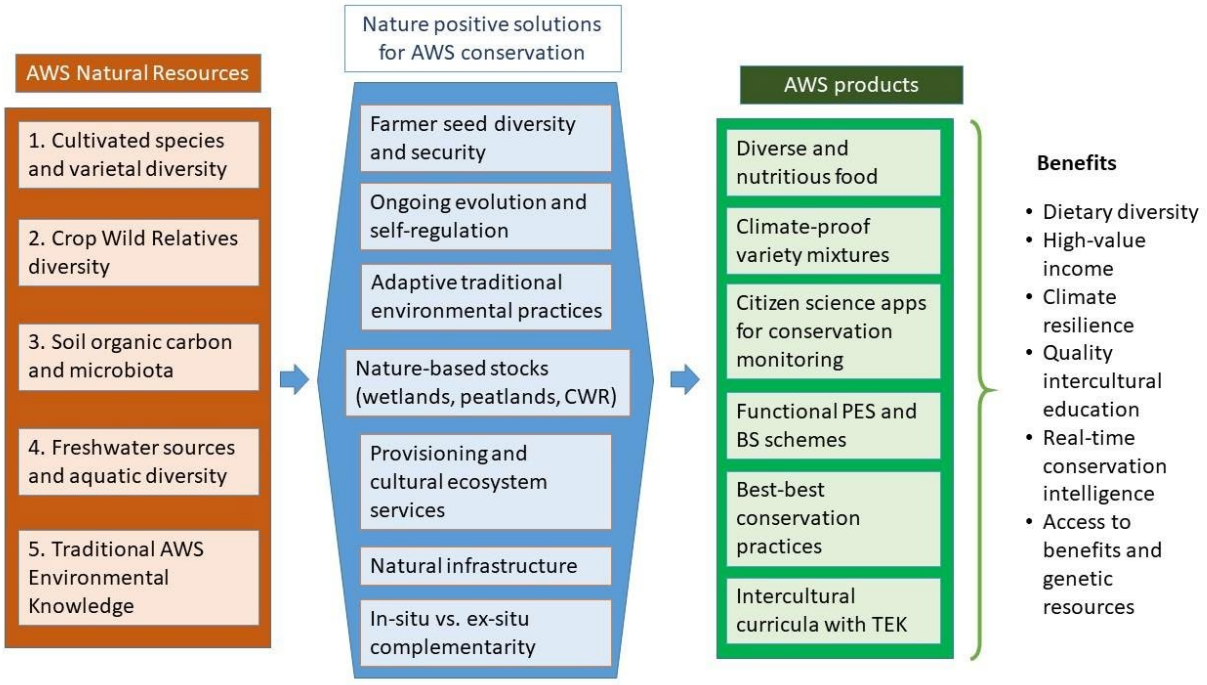


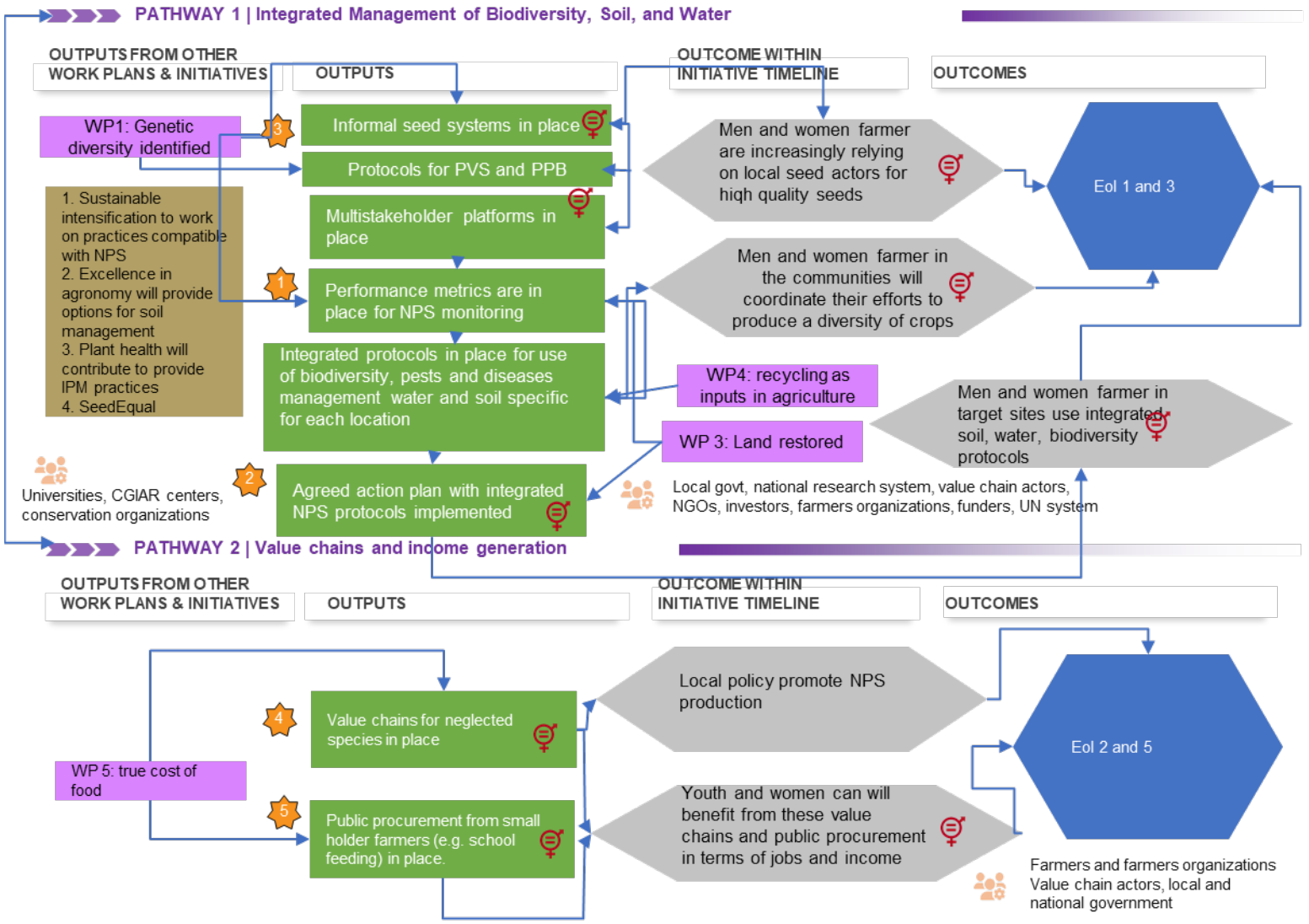
Figure 4. Nature positive solutions to be tested in WP1

IP2 focuses on the people on-the-ground who make in-situ and on-farm conservation of AWS happen. Incentives, such as payment for ecosystem services (PES) or benefit sharing investments, will motivate and reward the positive use of natural resources. Direct private benefit sharing will more effectively link the companies using a community's natural resources with the stewards responsible for conserving those same assets. Furthermore, intergenerational knowledge exchange and capacity building, 'modernized' though digital tools and interactive intercultural education, will (a) facilitate effective elder-youth learning, and (ii) ensure that high-tech tools and learning are blended with traditional AWS knowledge on the ground for optimal sustainability and community buy-in. IP2 will lead to a better suite of options for farmers and young rural entrepreneurs to make a decent living from the land and the resources they conserve.

The WP1 TOC is that when our targeted actors fully use the portfolio of outputs available to them (Figure 4), the conditions for effective, integrated agrobiodiversity conservation will be greatly improved. The behavioral, knowledge, attitude, skills and practice changes in different next- and end-users are anticipated to be: (i) researchers and practitioners using more efficient, accurate tools and metrics for real-time conservation monitoring, (ii) genebank curators and communities of landrace and CWR custodians collaborating more synchronously (gap analysis, characterization, repatriation, etc.), (iii) conservation practitioners using and expanding best-bet practices, (iv) teachers, families, and youth applying traditional AWS conservation knowledge in schools and extracurricular activities, and (vi) local stewards receiving direct (non-)monetary incentives for ecosystem services provision.

The NPS to be tested as part of WP1 TOC will trigger benefits in the nutrition security, livelihoods, education, and climate resilience of rural households. Being able to track the real-time conservation status of AWS will also reinforce the business case for public and private investment in supporting NPS for conservation. The **assumptions** underpinning WP1 TOC are listed in the TOC diagram.

3.2.2 Work Package 2 – Manage



ASSUMPTIONS

1. Methods and metrics exist to monitor nature positive outcomes at farms and landscape levels
2. All stakeholders are willing to engage in NPS and implement the action plans
3. Diversity is available and research and other seed actors support seed systems
4. Markets are possible for diversity products and new SMEs can be formed to benefit from markets
5. Policy makers are willing to procure nutrient dense food from smallholder

Work Package 2	**MANAGE: Sustainable, nature-positive management of biodiversity and other natural resources**
Work Package main focus and prioritization	WP2 asks: How can we use NPS to manage and diversify agricultural production and natural resources so that it both produces food and achieves other interconnected objectives such as environmental health, improved nutritional and food security outputs, sustainability, resilience, and farming livelihoods? WP2 works with smallholder communities' farmers to improve production systems by introducing NPS innovations, learning, and technologies around biodiversity, water and soil management, e.g., intercropping and crop rotation schemes, agroforestry, seeds, etc. Conservation-oriented and regenerative practices and approaches to promote beneficial species (pollinators, biocontrol agents, other insects) and associated ecosystem services through adequate levels of biodiversity (soil biodiversity, wild biodiversity, crop and genetic diversity) and integrating such practices with indigenous and local ones, will be co-designed with communities. Selected priority crops will be improved through participatory breeding and seeds will be available through strong farmer-led seed systems. Value chains and other income generating opportunities such as school feeding programs, will be developed with a focus on equitable incomes, job creation and diversification of livelihood opportunities.
Work Package geographic scope (global/region/country)	WP2 action research will be implemented in two regions/counties/provinces per target core country (Burkina Faso (Centre-East and North Region), Colombia (Antioquia and Orinoquia), India (two states among Maharashtra, Rajasthan and Chhattisgarh/Madhya Pradesh), Kenya (two counties among Kisumu, Vihiga, Turkana, Narok and Kajiado), and Vietnam (two provinces among Son La, Dac Lac and aN Giang). However, site selection will be refined at the onset of the Initiative. Prioritized sites are available in Annex 6.

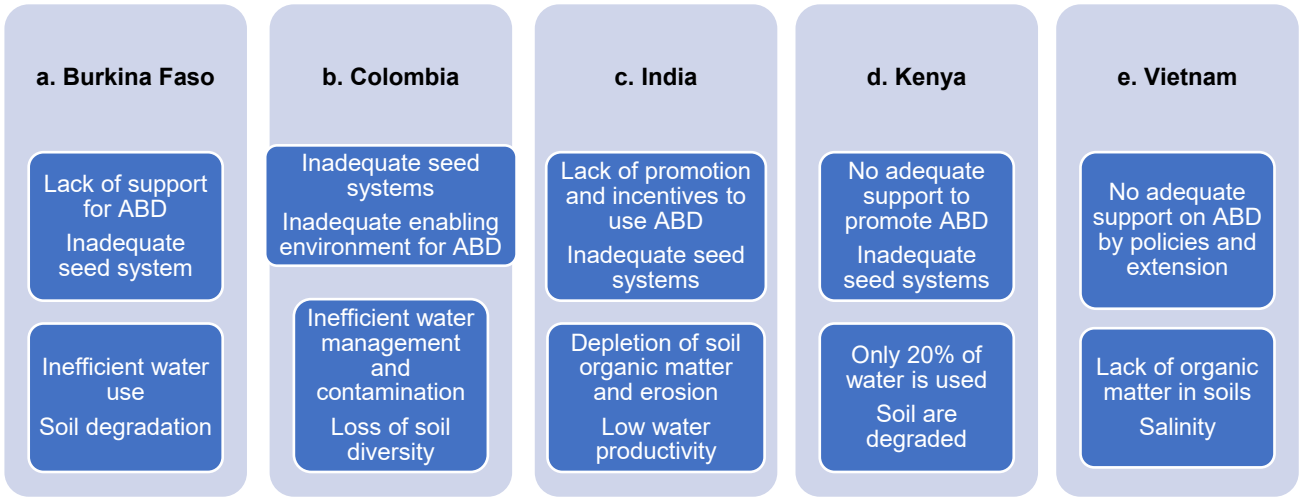


Figure 5. Priority management challenges per target country – as identified during the stakeholder engagement process

WP 2 Science narrative

Research questions	Main proposed scientific methods	Key outputs
How can production systems be designed to realize positive environmental, nutritional and production outputs, through optimal use of water, soil biodiversity, and biodiversity?	●Model-based exploration of farms maximizing diversity and ecosystem services to inform redesign by communities ●Innovative monitoring tools for better understanding of tradeoffs in the agriculture-environment nexus ●Seeds for Needs approaches and resilient seed systems to ensure availability of crops and genetic diversity and vibrant and functioning seed systems to make them available to farmers ●Resilient seed systems are developed ●Reduce water footprint through water-smart and nutrient dense neglected and underutilized species ●Participatory variety selection and breeding ●Reduce pests and diseases impact using up-to-date tools and methods ●improve access to nutritionally rich food sources and increase- dietary diversity within food production systems. ●Use of compost, manure and other organic fertilizers to enhance soil fertility and reduce the use of fertilizers ●Develop and implement practices for cropping system diversification, improved organic matter management, and reduced disturbance that can optimize the diversity and activity of soil biological communities. ●Monitoring tools for soil biodiversity ●Development of context specific approaches to enhance safety of marginal quality water use, crop water productivity and efficient use (e.g., efficient water storage and irrigation technologies, improved management of soil water capture and retention (e.g., mulch); matching crops to environments to balance crop water requirements and water availability ●User-friendly decision-making water management tool for capture, storage and efficient use of water for increased resilience, biodiversity and productivity specific for each location/site	●Multistakeholder platforms in place ●Performance metrics developed in collaboration with stakeholders for NPS monitoring and WP1 and 3 are in place (soil, water, biodiversity) ●Informal seed system in place ●Agreed action plan with integrated NPS protocols implemented ●Integrated protocols for promotion and use of soil biodiversity, pests and disease management, and soil and water conservation specific for each location ●Protocols for participatory variety selection and breeding

How can markets be developed for neglected species and linked to farmers through value chains to improve income and promote better nutrition?	● IFAD/Alliance how to do notes ● Market Environment Analysis ● Promote neglected species for their nutritional values	● Value chains for diverse set of products are in place in each country ● Public procurement from smallholder farmers (e.g., school feeding) in place.
How can a cluster approach be tested in the context of NPS?	● Farmers within the clusters are organized on a volunteer basis to manage their farms using a cluster approach, hence planning collectively the set of crops and varieties to be used in different years and the management strategies.	● Agreed action plan with integrated NPS protocols implemented through multistakeholder platform, linked to WP 1 and WP 3.
Synergies ● WP2 relies on outputs from other Initiatives for specific technical areas, specifically, from the Initiative on Plant Health for pest and disease (P&D) management techniques and from EiA for cutting-edge soil management practices.		

WP2 Theory of change narrative

IP1 of **WP2** contributes to **end-of-Initiative outcomes 1** and **3**, while **IP2** contributes to **2** (Section 2.2)

Adopting NPS at the farm level requires a shift in **management approach** from current approaches focusing on specialization on one or two major staple crops towards **diversification** of cropping systems and farming landscapes using a wider basket of crops and varieties more adapted to local environments, accompanied by improved management of soil and water.

IP1 focuses on promoting adoption of integrated packages for improved management of water, soil, and biodiversity. If key stakeholders (farmers, private sector, extension, research, local government) are aware of the true cost of food (**WP2, WP5**), they will be incentivized to embrace NPS approaches designed to reduce such costs and support new management trajectories. Making the true cost of food more explicit and coming to a consensus with AFS actors on the actions required to shift to improved water, soil, and biodiversity management approaches, are a prerequisite for producing the desired behavioral changes, i.e., AFS stakeholders, including smallholder farmers, using NPS to manage their water, soil, and biodiversity resources more effectively and with a more realistic understanding of the true cost of food, and how to use NPS to mitigate it.

IP2 focuses on generating livelihood opportunities through value chain development and public procurement (e.g., school feeding programs), especially those that use neglected and under-utilized species (NUS). IP2 assumes that only by linking NPS approaches to income opportunities and rural entrepreneurship can we provide the right incentives for enhanced adoption of NPS by farmers, research, extension, and decision makers. As women are generally custodians of diversity, special attention will be paid to involving women as drivers of NPS package co-design processes (boosting their agency and voice), and ensuring that they can access, benefit equally from, and participate in NPS-driven value chains.

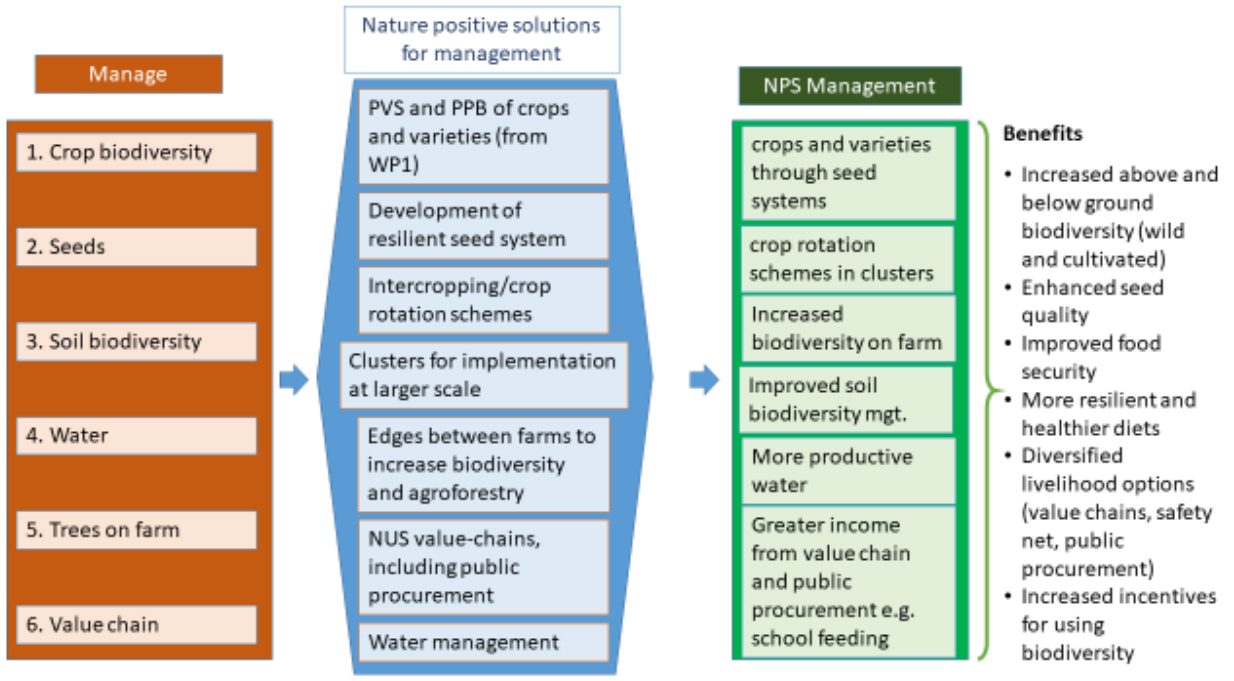
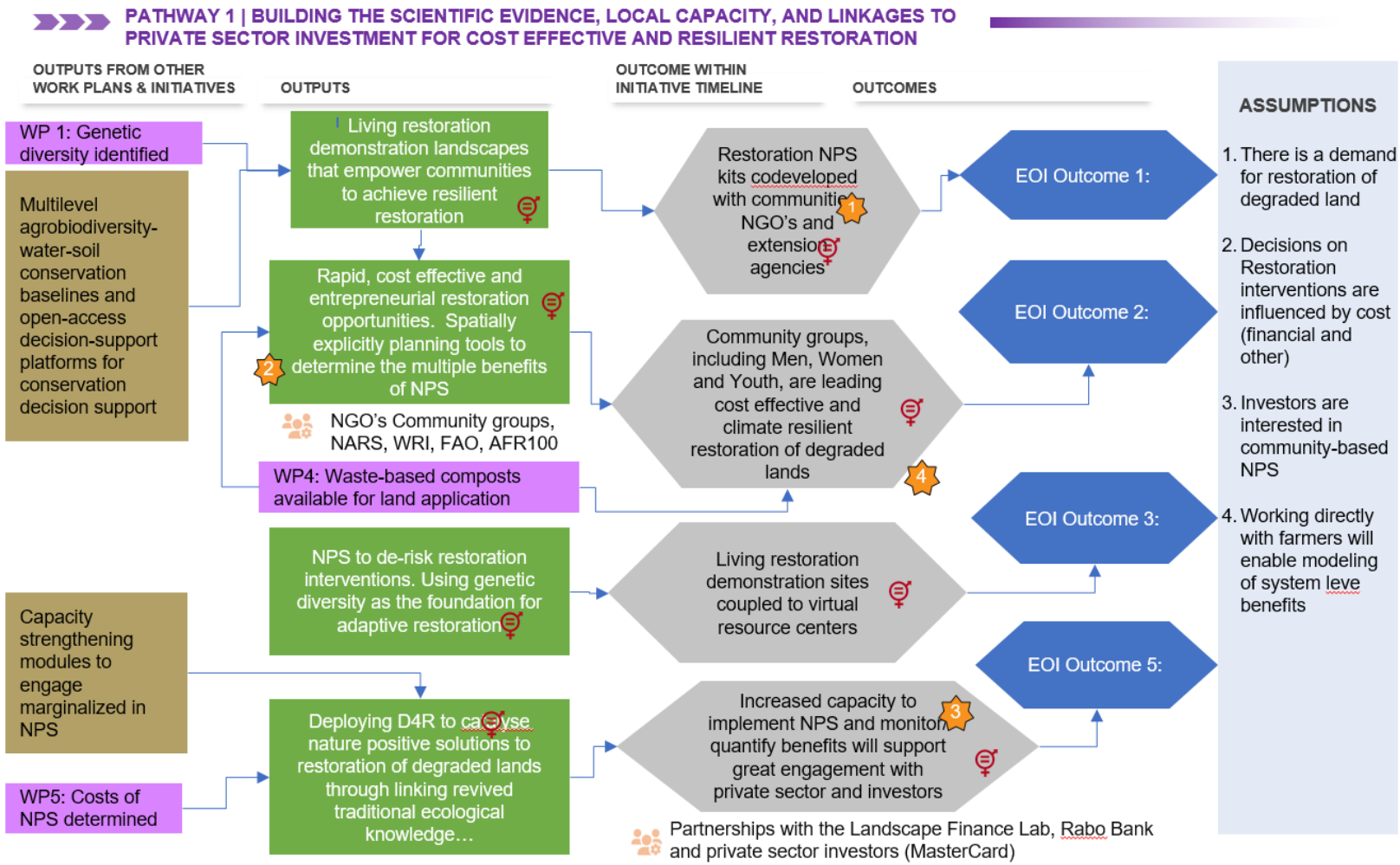


Figure 6. Nature positive solutions to be tested in WP2

WP2 focuses specifically on a broad set of innovations developed by the CGIAR, their partners and local communities. Drawing on metrics and indicators to monitor nature-positive impact (**WP1**), our approach of co-designing **sound soil, water, and biodiversity management approaches** with smallholder communities is anticipated to improve not only the productivity of natural capital (and therefore also income deriving from it via value chains and food production) but also its environmental benefit. Agrobiodiversity, soil and water innovations, with particular emphasis on linking forgotten foods and indigenous food systems with modern technologies and digital agriculture, will create new opportunities for youth and women, the custodians of this natural capital. Work will be largely implemented with local communities and NGOs, international development and environmental NGOs, local and national governments, extension agents, research organizations, and universities, via multistakeholder platforms.

Working under the **assumptions** that **(A1)** we offer convincing enough evidence about the value of NPS to improving food and nutrition security, livelihood and the environment to gain the support and buy-in of local governments, local research organizations and other relevant stakeholders, **(A2)** adequate biodiversity and natural capital is available from Year 2 for direct use or participatory variety selection and breeding, and **(A3)** public and private actors are willing to develop rural entrepreneurship to link to markets and public procurement, WP2 will contribute significantly to the EoI outcomes 1 and 3 for IP 1 and EoI 2 for IP 2, but especially **EoI Outcome 2**.

3.2.3 Work Package 3 – Restore



***Work Package* 3**	**RESTORE: NPS as cost efficiency models for community land restoration**
Work Package main focus and prioritization	Over the last decade, the CGIAR (through FTA, WLE and CCAFS) has delivered innovative basic and applied research on restoration across multiple dimensions, including seed systems, nutritionally sensitive and gender responsive restoration, as well as policy and governance aspects. This work has been coupled to important regional initiatives such as the AFR100 and 20x20 Initiative and supported the implementation of the Bonn Challenge and work by UN agencies including FAO and UNDP. However, despite significant progress, there is currently a lack of context-specific **cost efficiency models for community land restoration** that demonstrate the multiple benefits of NPS. This means that natural capital (in the form of land, forests, water systems) is under-valued, which in turn has resulted in missed opportunities for financial investment from the private sector. By providing the scientific evidence base, capacity to monitor and quantify ecosystem service delivery and maximize efficiency of interventions for resilient restoration, **WP3** helps local restoration stakeholders to establish innovative NPS for sustainable landscapes, which will both attract investment and break the degradation cycle.
Work Package geographic scope (Global/ Region/ Country)	WP3 action research will be implemented in two regions/counties/provinces per target core country (Burkina Faso (Centre-East and North Region), Colombia (Antioquia and Orinoquia), India (two states among Maharashtra, Rajasthan and Chhattisgarh/Madhya Pradesh), Kenya (two counties among Kisumu, Vihiga, Turkana, Narok and Kajiado), and Vietnam (two provinces among Son La, Dac Lac and aN Giang). However, site selection will be refined at the onset of the Initiative. Prioritized sites are available in Annex 6.

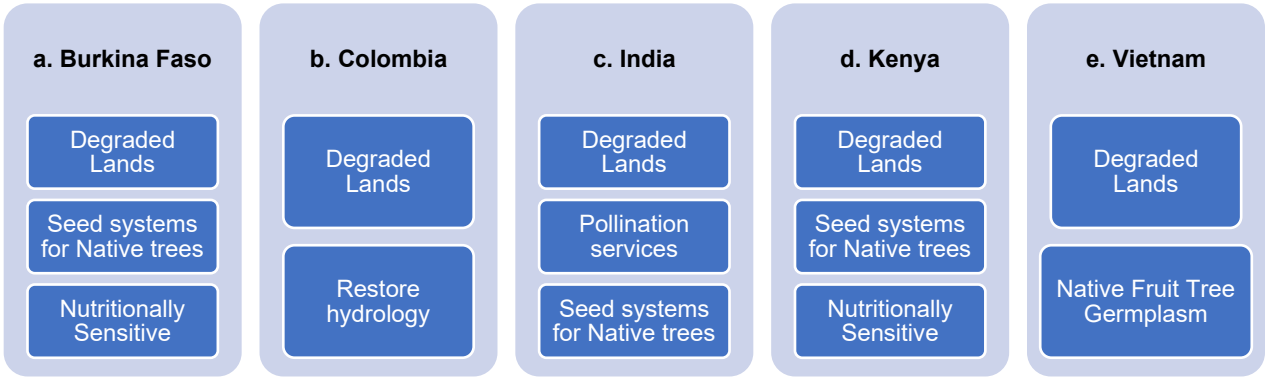


Figure 7. Priority restoration challenges per target country – as identified during the stakeholder engagement process

a. **Burkina Faso:** The main restoration challenges are nutritionally sensitive species selection, limited access to quality germplasm and resources for restoration maintenance. Tenure issues also lead to limited scaling, low seed quality and poor survival. Community based women's groups have been shown to be very powerful and lead to wider adoption.
b. **Colombia:** Incentives to transition to sustainable silvopastoral systems and improved management of degraded lands are urgently required. New value chains, access to quality native tree species and information on climate smart options are urgently needed.
c. **India:** Have set ambitious targets to restore degraded lands, but previous mass tree planting has failed to deliver social benefits. Need improved native tree seed systems that use the high diversity of valuable native tree species and source genetically diverse seeds, as well and conserve biodiversity on production landscapes to deliver pollination services.
d. **Kenya:** Millions of hectares of dry-arid lands are vulnerable to degradation from overgrazing, climate change and over exploitation of native vegetation for fuel, fodder or other uses. Alternative scalable restoration strategies that combine native tree diversity that are preadapted to local climate conditions and can enhance resilience to climate shocks are urgently needed.
e. **Vietnam**: Deforestation and a drive to increase agricultural production continue to lead to high levels of land degradation. High native fruit tree diversity and potential to increase fruit production offer substantiation potential for AFS, and carbon rich production landscapes. Access to quality and genetically diverse as well as locally adapted germplasm is a significant barrier.

WP3 Science narrative

Research questions	Main proposed scientific methods	Key outputs
Q1. What degradative cycles impair ecosystem resilience and the delivery of ecosystem services at farm and landscape level and how can these be diagnosed by land users to engage in restoration partnerships with the financial sector? *Link to WP5 (Engage): underlying drivers (poverty, tenure etc.) How are costs of degradation distributed*?	● Ecological modeling of above- and below-ground processes ● Systems dynamics analysis ● Internet of things (IOT) implemented for rapid monitoring of AWS in restored lands. ● Stakeholder mapping and engagement with restoration learning labs joining communities, scientists, investors, and private sector and investors	● Deploying D4R to catalyze nature positive solutions to restoration of degraded lands through linking revived traditional ecological knowledge
Q2. What are the most cost effective NPS to restore degraded lands that maximize multiple benefits, especially nutrition, carbon, biodiversity and water (AWS) whilst break the degradation cycle? What are the barriers to adoption? *Link to WP5 (Engage): How do needs and perceived benefits vary between land users? How are these negotiated and how can inclusion be fostered?*	● Spatially explicit restoration simulation models that account for gender and other social differences to explore tradeoffs between food security, livelihoods, environment and the temporal scale of benefit delivery. ● Identification of existing good practices and models, including those based on local and traditional knowledge	● Rapid, cost effective and entrepreneurial restoration opportunities. Spatially explicitly planning tools to determine the multiple benefits of NPS ● Living restoration demonstration landscapes that empower communities to achieve resilient restoration
Q3. What are the ecosystem service delivery benefits of different NPS restoration interventions? And how can digital tools lift barriers to adoption? *Link to WP1, WP2 and WP4 (Conserve, Manage, Recycle)*	● Rapid biodiversity and ecosystem service assessments both above and below ground (already developed by the alliance). These include: evaluation of soil faunal communities (TSBF-CIAT protocol developed by the Below Ground Biodiversity project funded by UNEP) + Next Generation Sequencing technologies for assessing microbial diversity and functionality, quantification of carbon sequestration, erosion control, soil health pollination, biocontrol, habitat connectivity, soil erosion control, nutrition, and livelihoods, using household surveys, Development of climate smart restoration decision support tools, such as D4R and SeedIT, that provide user-centered and tailored solutions. ● Development of extension delivery options (incl. Digital and private services) ● Social network analysis on seed networks / value chains?	● NPS to de-risk restoration interventions. Using genetic diversity as the foundation for adaptive restoration
Synergies ● WP3 will work closely with WPs: Conserve, Manage, Recycle and Engage, to maximize synergies and impact. ● WP3 will also link strategically to other One CGIAR Initiatives (Agroecology, Mitigate+ SHiFT, Nexus Gains).		

WP3 Theory of change narrative

WP3 contributes most strongly to **end-of-Initiative outcomes 1, 2, 3 and 5.**

The **TOC** for **WP3** is that, by adopting NPS specifically targeting restoration objectives (Figure 8) – honed through restoration models, demonstration landscapes, and scientific evidence - marginalized communities will be able to restore degraded communal lands more effectively, thus breaking the degradation cycle. Improvements to the knowledge, capacity, and incentives around restoration-focused NPS will ensure that they are more firmly entrenched in local AFS and more effectively scaled. For these changes to be sustainable over the longer term, these NPS must both (a) make economic and financial sense to restoration actors, and (b) enhance local resilience to climate change.

WP3 will overcome the barriers that currently constrain the development and adoption of NPS by beneficiary groups, such as, for example, the traditional ringfencing of restoration objectives from other important community objectives such as local livelihoods, cultivation of NUS, and equitable benefits sharing for women and youth, by co-developing NPS with the marginal communities in or around communal land. Coupling the testing of native tree or crop species with locally context specific models will demonstrate the long-term benefits of NPS to marginal communities, paving the way towards improved uptake.

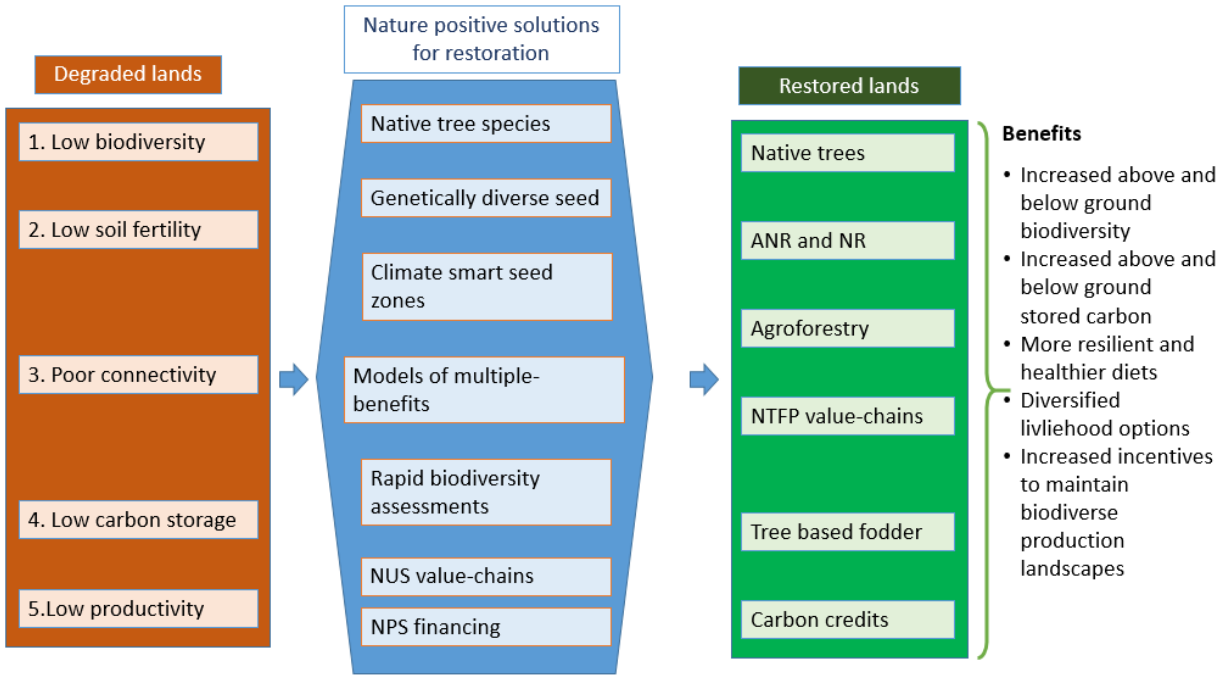


Figure 8. Nature positive solutions to be tested in WP3

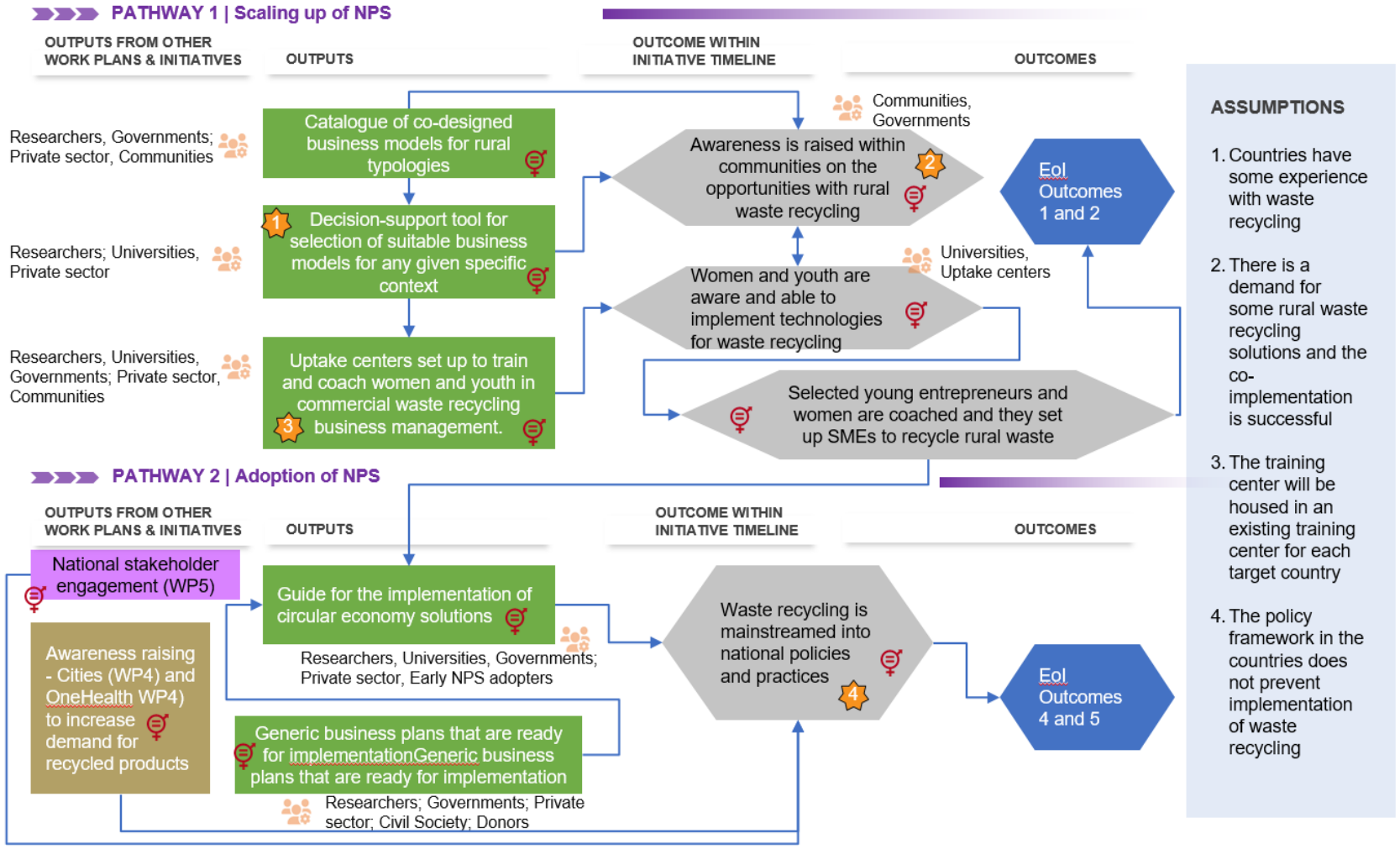
User-centric design (UCD) and participatory action research (PAR) with local community groups, NGOs national research partners, and government agencies in each project site will (a) produce an evidence base for restoration-focused NPS that is both backed by rigorous science and validated by communities, and (b) translate the scientific theory behind NPS into practical applications – diagnostic and decision-support tools, entrepreneurship training,

multistakeholder platforms, brokerage of investment opportunities - that will empower *all* restoration actors, from local community groups to major restoration investors, to adopt and deploy restoration-focused NPS that not only effectively restore degraded land, but also optimize restoration co-benefits such as increased livelihood options, improved social equity, and increased conservation of biodiversity (NUS) for use in nutrition and economic pathways.

In establishing restoration demonstration sites coupled to virtual resource centers that enable community groups to learn, share knowledge and experience and receive advisory support on NPS in restoration, WP3 will strengthen the scientific evidence base for the potential impact of NPS on significantly enhancing native tree diversity, soil biodiversity and landscape level connectivity (towards **EoI 1**). Enhancing community access to NPS value chains based on NUS, non-timber forest products (NTFPs) and crop wild relates (CWR) will lead to a more sustainable use of biodiversity and public/private incentives to enhance diversity on degraded lands (towards **EoI 2**). Partnerships with NARS, co-learning with communities through multi-stakeholder workshops, and integration of traditional knowledge into models will improve the mainstreaming of participatory research approaches in NARES systems (towards **EoI 3**). Increasing the capacity of women and men smallholders (and youth) to implement NPS and quantify their benefits and co-benefits will create greater social equity and stimulate engagement with private sector and financial investors (towards **EoI 5**).

This TOC **assumes** that local farmers and AFS stakeholders will adopt NPS as the most cost-efficient and rewarding choice. Other assumptions are that NATURE+ will provide sufficient business case evidence to convince the public and private sector to reorient investment towards NPS as financially viable, low risk ways to approach restoration with high returns in terms of social benefits.

3.2.4 Work Package 4 – Recycle



Work Package 4	**RECYCLE: NPS for a circular economy approach to rural waste management**
Work Package main focus and prioritization	Linear economic models and consumption patterns generate millions of tonnes of liquid and solid waste in rural areas, most of it directly linked to agricultural production, which negatively impacts nature through GHGE, contamination of water resources and soil, and human and environmental health degradation. WP4 is unique in the One CGIAR Initiative portfolio for its focus on **rural waste** (Glossary), an underrated waste stream[4]. WP4 will work with rural communities, universities and training centers, private sector actors, and government bodies to ensure that **NPS recycling solutions are used more effectively by women- and youth-led SMEs to generate increased resources (both natural and financial) that benefit poor farming households in rural areas and contribute to GHGE reduction.**
Work Package geographic scope (global/region/country)	WP4 action research will be implemented in two regions/counties/provinces per target core country (Burkina Faso (Centre-East and North Region), Colombia (Antioquia and Orinoquia), India (two states among Maharashtra, Rajasthan and Chhattisgarh/Madhya Pradesh), Kenya (two counties among Kisumu, Vihiga, Turkana, Narok and Kajiado), and Vietnam (two provinces among Son La, Dac Lac and aN Giang). However, site selection will be refined with country partners at the onset of the Initiative. Prioritized sites are available in Annex 6.

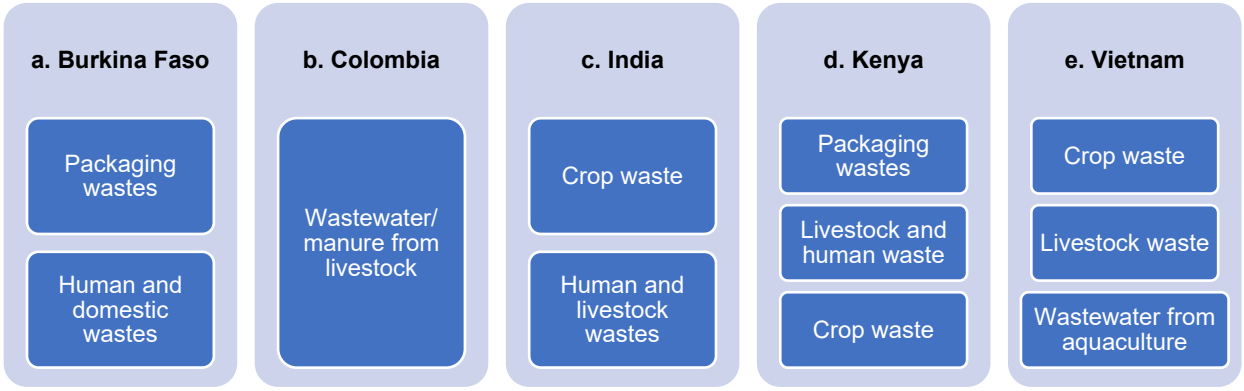


Figure 9. Priority rural waste areas per target country — as identified during the stakeholder engagement process

a. **Burkina Faso:** The main rural waste challenge is related to safe management of phytosanitary and fertilizer packaging and human/domestic wastes. Poor management leads to contamination of seeds, crops and agro-residues recycled as animal feed, causing food poisoning, sometimes death. Rural waste also pollutes the soil, contaminates the surface- and groundwater, and contributes to the proliferation of rats and mosquitoes, themselves vectors of disease.
b. **Colombia:** Agriculture is the single largest producer of wastewater by volume, and in rural areas, management of livestock excreta is a major concern and challenge.
c. **India:** About 350 million tonnes of agricultural waste are generated yearly, with 25% from the rice-wheat system. Only a small proportion of the agro-waste is recycled, e.g., as dry fodder, livestock bedding, thatching material for housing, and fuel. Most of the remainder is burned, leading to GHGE and air pollution that negatively affects public health.
d. **Kenya:** The agro-waste production disposed of in the environment is estimated at over 13 million tonnes per year This includes phytosanitary and fertilizer packaging, livestock excreta, and crop waste. Some efforts by smallholder farmers and green energy organizations to recycle agro-waste to produce energy exist, but they are rare, operate at micro scale and lack capacity to be scaled-up.

[4] The 'Resilient Cities' Initiative focuses on management of urban waste (i.e., domestic or municipal solid waste, fecal sludge, sewered wastewater) generated in urban and peri-urban areas. The 'One Health' Initiative addresses animal waste in the perspective of health risk mitigation, not productive use through a circular economy approach. The Nature positive Initiative is therefore unique in its intention to tackle rural waste.

e. **Vietnam:** About 100 million tonnes of crop residues are generated annually, largely from production of rice (67%), maize, sugarcane, and cassava. But 60% of rice straw is burnt. In addition, some 80 million tonnes per year of livestock waste are also generated from pig farming (30%), poultry (27%), cattle (24%), and buffalo (17%), producing between 16% (in intensive farms) to 40% (in smallholder farms) of untreated nutrient-rich manure discharged directly into the environment. Aquaculture also leads to the discharge of untreated wastewater into water bodies. In 2008, 11,000 and 240,000 tonnes of pesticides and fertilizer packaging materials were generated, respectively.

WP4 Science narrative

Research questions	Main proposed scientific methods	Key outputs
1. Which circular economy-based innovations in rural areas respond to priority local demands, needs, and capacity, while maximizing benefits to rural communities, in particular poor women?	● Feasibility studies on availability and characteristics of rural waste ● A participatory approach to co-design business models with communities that respond to their needs and context-specific challenges ● Multi-criteria decision-making (MCDM) approach ● Assessing the enabling environment to identify possible financing mechanisms ● Perception studies for waste-based products' adoption ● Review and impact assessment of existing/past business models ● Comparative assessments of technologies for energy, water, nutrients and organic matter recovery. ● Cost estimation and market valuation methods ● Economies of scale functions to estimate operation and maintenance costs for different technologies and operation scales in developing countries	4-1. Catalog of co-designed business models, including a technology guide, for rural typologies that are gender-friendly, technically sound, financially and economically profitable, socially acceptable and environmentally sustainable 4-2. Decision-support tool for selection of suitable business model for any given or specific context.
2. How can women and youth in rural areas be supported to develop and launch resource recovery businesses?	● Assessment of gender issues and eventually scoping which will help to reduce gender inequities ● Capacity building needs assessment (through participatory approaches) ● Capacity building workshops, trainings, coaching, and field demonstrations ● Knowledge sharing of business ideas/models with interested entrepreneurs towards setting-up rural enterprises ● Financial feasibility of businesses through cashflows, seed financing, net present value (NPV) and internal rate of return approach (IRR)	4-3. National uptake centers (one per country) 4-4. Generic gender-friendly business plans that are ready for implementation
3. What are the main barriers that hinder adoption of circular economy business models at scale?	● Investment climate assessment, policy review, institutional analysis, political, economic, and social approach towards understanding the scaling-up process and implementation ● Non-market valuation methods ● Stakeholder engagement ● Compilation of case studies and learnings from implementation of circular economy business models in rural areas (including early NPS adopters), nationally and globally ● Clean Development Mechanism (CDM) methodology to estimate carbon and energy savings	4-5. Gender-friendly guide for the implementation of circular economy solutions in rural areas

WP4 Theory of change narrative

WP4 contributes to **end-of-Initiative outcomes 1, 2, 4 and 5** (See Section 2.2).

There is a large body of CGIAR work on waste management in urban/peri-urban areas, focusing on development of circular economy business models, technology and recycled product use. Research conducted by the WLE CRP (Rural-Urban Linkages flagship) demonstrated that financially viable business models managed under innovative partnership arrangements can enhance and sustain recycling of organic waste. However, despite safe management and resource recovery being recommended for inclusion in national policies to mitigate waste-related GHGE, successful business and use cases are in short supply. Issues such as lack of capacity, technical challenges with logistics, production and product quality, and restrained potential to achieve waste-based product sales and attain financial viability, constrain the adoption of waste-management NPS. Resolving these bottlenecks at source to optimize rural waste recycling and management will increase the availability of environmentally friendly inputs for soils and crops, especially nutrients and organic matter, creating valuable opportunities for production of green energy (biogas, biomass briquettes, or electricity), animal feed (e.g., proteins from black soldier fly larvae), and new products (e.g., bioplastics), among others. This circular economy approach will create valuable employment and livelihood opportunities for women and youth during the off-season in rural communities.

[Pathway 1: Adoption to EoI Outcome 2]

Development of a **catalog of potential agro-waste business models (**Figure 10**)** and the **decision-support tool,** coupled with awareness-raising and capacity building of community members and AFS actors, will build confidence and buy-in for the value (both natural and financial) of rural waste recycling. Coaching and seed financing will help overcome the fear of failure for early adopters, giving researchers the opportunity to monitor their adoption experience and adaptively strengthen the business plans.

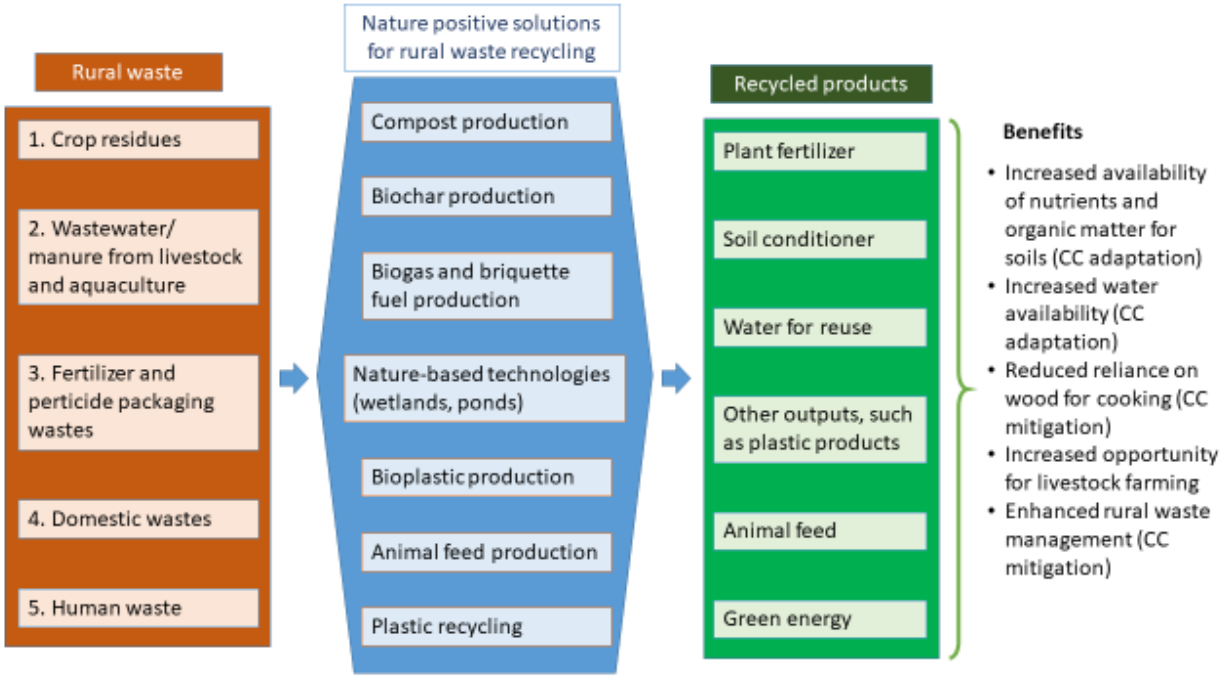


Figure 10. Nature-positive solutions under NATURE+ to be tested in WP4

Note: The waste types are given per order of priority. The ultimate selection of solutions to prioritize in each country will be done with inputs from the communities and taking into account the landscape.

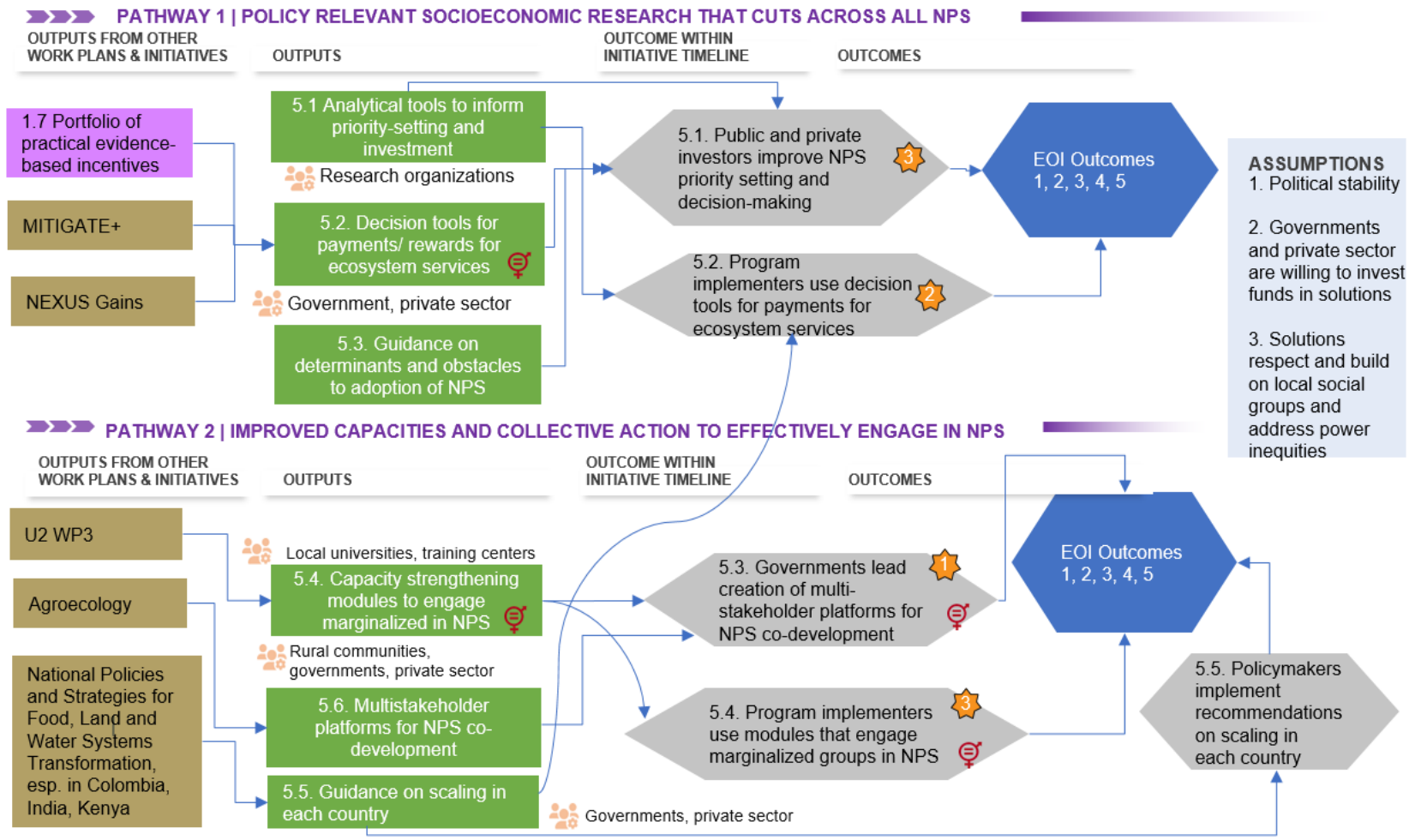
National uptake centers will both enhance the capacity of the next-adopters in recycling practices and provide them with access to funding for investment, marketing and use of waste-based products. Following on from training with validated plug-and-play style **business plans** (informed by feedback from early adopters), young entrepreneurs will then be able to independently implement rural waste recycling practices that improve their livelihoods and access agro-waste incentive schemes.

[Pathway 2: Scaling up to EoI Outcome 5]

Involving key policy stakeholders in the assessment of NPS benefits, value and potential associated with rural waste recycling will cement public trust in the evidence and facilitate its uptake into national policies. Through WP5, we will connect with other CGIAR Initiatives focusing on other waste streams to co-create an enabling environment that supports recycling. To address possible perception issues, especially for newer recycled products, we will coordinate with other Initiatives (One Health WP4 and Cities WP4) planning end-user behavior change interventions.

WP4 contributes to enhanced environmental health, climate-change mitigation, and adaptation, with impacts on nutrition and food security. By enhancing poor households' agro-waste-based revenues, especially women and youth, WP4 will contribute to national efforts to ensure that AFS operate sustainably within planetary and regional environmental boundaries. The **assumptions** underpinning this TOC are listed in the WP4 TOC diagram.

3.2.5 Work Package 5 – Engage



Work Package 5	**ENGAGE: Engage key actors in creating an enabling environment for NPS**
Work Package main focus and prioritization	In order for NPS to be taken up and sustained in the longer term, there needs to be a positive enabling environment around them, from policy and advocacy to helping shape economic incentives to support NPS uptake, especially among women and youth actors who might lag behind in adoption of new solutions, technologies or approaches in general. WP5 establishes a firm foundation for this enabling environment by (a) researching the true cost of food, including the hidden costs of women's labor, (b) valuing and shaping different types of incentives to encourage greater ecosystem services/biodiversity conservation, and (c) building implementation and scaling capacity related to NPS mainstreaming.
Work Package geographic scope (global/region/country)	WP5 action research will be implemented in two regions/counties/provinces per target core country (Burkina Faso (Centre-East and North Region), Colombia (Antioquia and Orinoquia), India (two states among Maharashtra, Rajasthan and Chhattisgarh/Madhya Pradesh), Kenya (two counties among Kisumu, Vihiga, Turkana, Narok and Kajiado), and Vietnam (two provinces among Son La, Dac Lac and aN Giang). However, site selection will be refined at the onset of the Initiative. Prioritized sites are available in Annex 6.

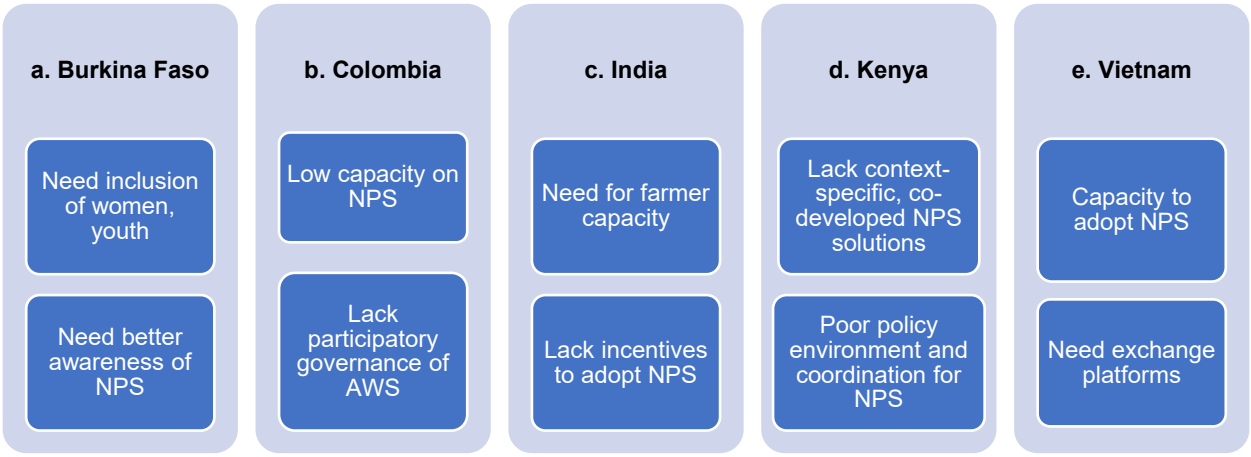


Figure 11. Priority engagement and inclusion challenges per target country – as identified during the stakeholder engagement process

WP5 Science narrative

Research questions	Main proposed scientific methods	Key outputs
What is the true cost of current food production systems, taking externalities into account? What are the costs of shifting to more sustainable production and consumption patterns, who should pay for them, and what are the implications for marginalized groups? What are the hidden costs to women of food production? What is the value of restored ecosystem services and more biodiversity-based approaches to agricultural production?	● Local assessment of ecosystem services, benefit transfer methods for ecosystem service values, models to upscale findings ● Adapt/apply the TEEB AgriFood evaluation framework to conduct true cost accounting analysis to evaluate relevant alternative food production systems ● Assess ecosystem services using modeling tools such as the InVEST and estimate the economic values of ecosystem services provided by alternative food production systems	**5.1 Analytical tools** to inform priority-setting and investment
What payments/rewards for ecosystem services (PES) and other tools are most impactful for the adoption of NPS by key actors?	● **Conduct key informant interviews, focus group discussions and structured surveys** to review existing mechanisms, including rewards and regulations, with a focus on PES, to identify determinants and	5.2. **Decision tools** for payments/rewards for ecosystem services 5.3 **Guidance** on determinants and obstacles to adoption of NPS

	constraints to scaling by marginalized groups ● **Conduct three household and community level surveys** to assess benefits of key NPS in Colombia, Kenya and India. ● **Develop foundations for piloting one PES scheme** ● **Conduct general public survey and contingent valuation** to assess willingness to pay (WTP).	
What capacities, institutions, and policies are most impactful to scale NPS?	● **Identify institutional mechanisms** (including private sector and civil society partnerships) to build capacities and reach marginalized social groups in India and Kenya. ● **Socioeconomic analysis** via literature review, participatory needs assessments, key informant interviews, and focus group discussions	5.4. **Capacity strengthening modules** to engage marginalized in NPS 5.5. Recommendations on scaling in each country 5.6 Multistakeholder platforms for NPS co-development
Linkages • PES links to MITIGATE+ on methodologies to incentivize carbon storage and maximize carbon retrieval along value chains and production processes • Engaging and strengthening capacity of marginalized groups in Kenya will link to the *Ukama Ustawi* Eastern and Southern Africa WP3 Empower and Engage • In India: the multistakeholder platform 'Ecosystem based Adaptation for Resilient Incomes – ECOBARI' will be relevant, as will linkages to governance of water, energy food, ecosystem health Nexus in NEXUS Gains • Policy engagement links to National Policies and Strategies for Food, Land and Water Systems Transformation, especially in Colombia, India, and Kenya and linkage with Agroecology Initiative on policy engagement • WP5 will provide cohesion to all the WPs, integrating all socioeconomic research topics within the IDT. WP5 will be the home of these cross-cutting issues even if other WPs conduct the research.		

WP5 theory of change narrative

WP5 contributes to **end-of-Initiative outcomes 1-5,** but particularly **3-5** (Section 2.2).

Uptake of NPS remains limited in smallholder communities because (1) incentive mechanisms are geared to farmers for adopting industrial-style farming approaches rather than NPS, (2) benefits of adoption transcend these communities while costs can be large; (3) solutions require collective action and an enabling environment to generate substantial benefits, and (4) there is lack of public understanding around the benefits and costs of solutions and which solutions work best and where.

We want policymakers to prioritize policies, incentives, regulations, and capacities that engage marginalized communities in NPS. Our **TOC** addresses this core challenge through two IPs, namely (1) Policy-relevant applied socioeconomic research that cuts across all Initiative WPs, using innovative decision support tool kits, and (2) Improved capacities and collective action of key stakeholders to effectively engage in NPS, using a suite of innovative tools to 'engage' stakeholders to/in support of NPS. Policy communication and enabling environment building will be cross-cutting in both pathways.

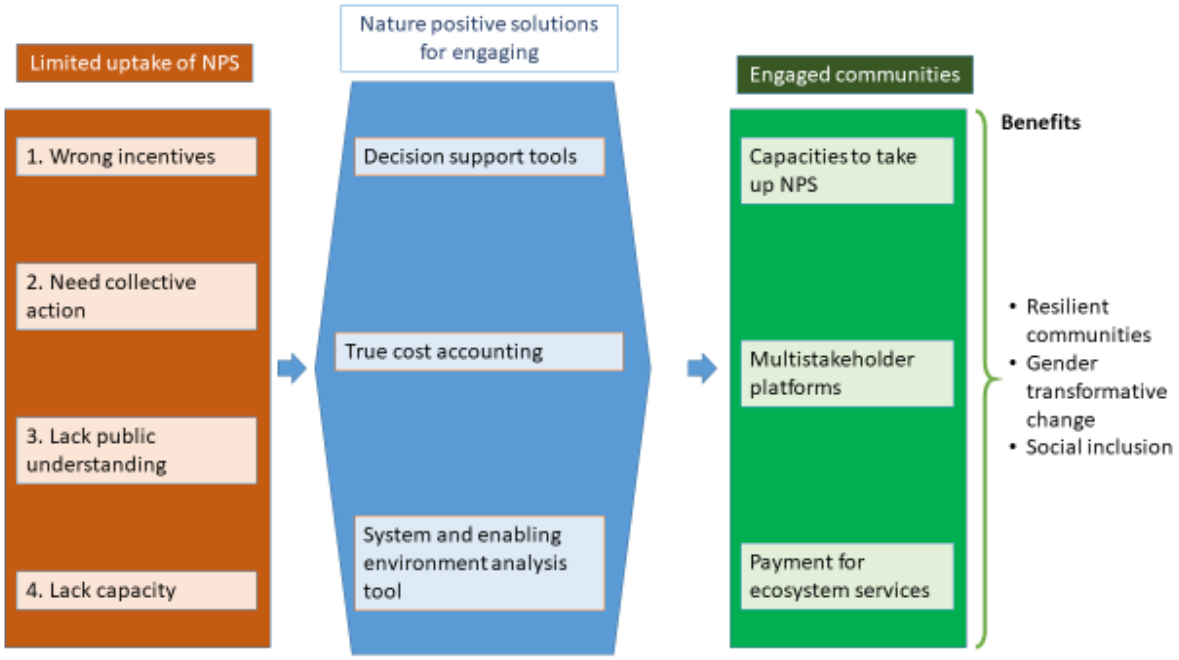


Figure 12. Nature positive solutions to be tested in WP5

For **IP1**, helping decision makers understand the true cost of current food production systems is the starting point. Providing CGIAR and partner-created analytical tools to decision makers, assessing ecosystem services, and applying the agrifood evaluation framework and modeling tools with farmer representatives, local and regional decision makers, and other key stakeholders will ensure that policymakers are equipped with actionable, evidence-supported. guidance and insights, which should lead to more informed decision-making around NPS incentivization, scaling, and uptake.

IP1 will identify and address the key determinants of and obstacles to scaling, as well as the full range of benefits and co-benefits generated by NPS adoption at household and community level. Research with landscape managers, farmer representatives, and local authorities in the target and with key environmental organizations will help identify appropriate institutions, capacities, and incentives to scale NPS. IP1 should result in high-level policy dialogues with governments and investors drawing on the case studies and guidance documents as well as policy briefs and outreach materials. We will collaborate with the Agroecology, MITIGATE+, NEXUS Gains, National Policies and Strategies for Food, Land and Water Systems Transformation, and relevant regional initiatives to ensure that research findings are mainstreamed. **WP Outcomes** under IP1 include (1) Governments improve priority-setting around NPS; (2) Public and private investors improve NPS decision-making, and (3) Program implementers use decision tools to design payments/rewards/regulations for ecosystem services.

IP2 will support multistakeholder collective action and capacity strengthening processes at the regional and national levels using digital and traditional communication tools. IP2 will work with farmer organizations, local government, grassroots organizations and private sector actors to build alliances and strengthen the capacity of key actors to identify and advocate for a stronger enabling environment for NPS.

Participatory needs assessments, policy process research and research results on the true cost of food and appropriate institutions and incentives will feed into these multistakeholder platform processes. Multistakeholder platforms established in all five countries and scalable capacity strengthening modules will help marginalized social groups such as women and youth engage more actively in NPS (from co-design and adaptation to incentives around uptake), as well as allow for contextual specificity. **WP Outcomes** under IP2 include (1) Public and private investors improve NPS decision-making; (2) Program implementers use decision tools for payments/rewards for ecosystem services; (3) Governments lead the creation of multistakeholder platforms for NPS co-development; (4) Program implementers use training modules that engage marginalized groups in NPS; and (5) Policymakers implement recommendations on scaling in each country.

4. Innovation Packages and Scaling Readiness Plan

4.1 Innovation Packages and Scaling Readiness Plan

The NPS Initiative will use the Scaling Readiness approach to pilot, adapt, stage-gate, and scale 1-3 Innovation Packages per WP, each comprised of 4/5 core innovations for a total of about 30, including:

(1) monitoring toolboxes, metrics and practices (WP1, **scaling type**: horizontal, **Partnering Initiatives**: Genebank),
(2) NPS-specific protocols for AWS management and biodiversity-based value chains (WP2, **scaling type**: *vertical and horizontal,* **Initiatives**: SeedEqual),
(3) Sustainable use of soil and water (WP 2 and 3, **scaling type:** horizontal, **Initiatives**: EiA, Sustainable intensification),
(4) Spatial planning tools for (WP3, **scaling type**: *horizontal,* **Initiatives:** AE, Nexus, Sustainable Finance),
(5) Decision support framework for rural waste and circular economy options (WP4, **scaling type**: *vertical*, **Initiatives**: Urban/Peri-Urban, One Health) and
(6) Analytical tools for true food cost accounting and policy and incentive options (WP5, **scaling type**: *vertical,* **Initiatives**: AE, Nexus, NPS, U2).

All WPs will collaborate with relevant RIIs, as well as the Foresight Initiative and Digital Inclusion Initiatives.

NATURE+ will apply the Innovation Packages and Scaling Readiness approach to 51–75% of its innovation portfolio by end of 2024. Some NPS core innovations like PES only require adaptation and additional market testing to be scaling ready. Others will need to be co-developed with the local communities, waste recycling actors, and NARES actors on the ground.

Upon inception, the Scaling Readiness assessment will support evidence-based innovation portfolio/pipeline management and stage-gating with criteria designed to inform go/no go decisions that move an innovation further along the R4D funnel.

The NPS Initiative will join Scaling Backstopping Wave 2 commencing in Q4 2022, with the first scaling readiness plan developed by Q1 2024. The Initiative allocated US$500,000 to implement the Innovation Packages and Scaling Readiness plan (year 1: US$50,000; year 2: US$200,000; year 3: US$250,000). Dedicated activities, deliverables, indicators and line-items are included in the MELIA, Management Plan and Budget Section.

5. Impact statements

5.1 Nutrition, health and food security

Challenges and prioritization: According to *The State of Food Security and Nutrition in the World (SOFI),* the high cost of healthy diets and persistently high levels of poverty continue to keep healthy diets out of reach for 3 billion people. In addition, about 800 million people in the world faced hunger in 2020 – 161 million more than in 2019. NATURE+ addresses these challenges by promoting diversification of food production systems (WP1, 2, and 3) and NPS-based value chain development (**WPs 2, 3** and **4**) to ensure that more nutritious foods, especially the neglected/underutilized species, are available for local diets, thereby contributing to food and nutrition security. In addition, using PVS and PPB win crop improvement programs with NARES will allow to improve productivity for selected target crops.

Research questions: (**WP1**) How can the conservation status of Agrobiodiversity, Water & Soils (AWS), be systematically and coherently measured to track multilevel changes - from genes to landscapes - in space and time? (**WP2**) How can production systems be designed to realize positive environmental, nutritional and production outputs, through optimal use of water, soil biodiversity, and biodiversity? How can markets be developed for neglected species and linked to farmers through value chains to improve income and promote better nutrition? (**WP3**) What are the most cost effective NPS to restore degraded lands that maximize multiple benefits, especially nutrition, carbon, biodiversity, and water (AWS) whilst breaking the degradation cycle? What are the barriers to adoption?

Components of Work Packages NATURE+ enhances nutritional outcomes through promotion of crop and genetic diversity (including tree species) in production systems, NUS-based value chains development and public procurement (**WPs 2, 3*)***. **WP 2's** biodiversity component will have an explicit ***nutrition focus***. Its value chains will promote ***nutritious*** species and varieties, including vegetables. **WP3** will promote the use of certain fruit trees and bushes for land restoration that also provide important co-benefits such as more nutritious local diets. Crops and varieties will be characterized for nutrient profiles and integrated into a conservation strategy (**WP1**).

Measuring performance and results: Through NATURE+ farmers and consumers will have access to a broader food basket, as more crops, particularly NUS and fruits, will be produced and consumed. Women and children will particularly benefit from nutrient dense crops and varieties. Results will be measured by the number of people with access to healthy diets and of nutrient dense species/varieties introduced in the production system.

Partners: See ***Partner Annex*** here, differentiated by Innovation, Demand, and Scaling Partners and by Country. Key partners for all **Impact Areas** include government ministries and NGOs involved in agriculture (water, soils, biodiversity), nutrition, maternal and child health, and environmental protection, communities, including women and youth, FBOs, national universities and training centers, policy think tanks, seed banks, funders, private sector and multilateral agencies implementing nature positive agriculture programs and policies***.***

Human resources and capacity development of Initiative team: The NATURE+ team includes a nutrition expert who will work on linking biodiversity to improved diets, to be complemented by an agronomist and genetic diversity experts. NATURE+ economists conducting trade-off assessments will consider food security, nutrition, and health.

5.2 Poverty reduction, livelihoods and jobs

Challenges and prioritization: The majority of poor in our target countries live in rural areas. As per a report from WRI, existing subsidies have not managed to significantly reduce poverty. Further, marginalized smallholder farmers have difficulty accessing markets and value chains based on NUS, including native tree species that might otherwise provide valuable income opportunities. NATURE+ prioritizes the development of value chains for neglected species and varieties (**WP2** and **3**) as well as from recycling rural waste (**WP4**), including through public procurement, using NPS to stimulate rural entrepreneurship, create employment and foster SME growth around seeds, nutrient-dense foods and waste. PES will be used to reward communities that contribute to the conservation of (agro)biodiversity, adopt regenerative practices and restore degraded areas.

Research questions: (WP2) How can production systems be designed to realize positive environmental, nutritional and production outputs, through optimal use of water, soil biodiversity, and biodiversity? (**WP4**) How can women and youth in rural areas be supported to develop and launch resource recovery businesses? (**WP5**) What is the true cost of current food production systems, taking externalities into account? What payments/rewards for ecosystem services (PES) and other tools are most impactful for the adoption of NPS by key actors? What capacities, institutions, and policies are most impactful to scale NPS?

Components of Work Packages: All WPs contribute to this IA, under the assumption that adoption of NPS will be extremely weak if poverty and access to jobs are not addressed. **WP1** addresses poverty by investigating which social incentives, value and governance systems drive AWS conservation and how these can be strengthened. **WP2** will develop value chains for seeds (local seed systems) and NUS, targeting women and youth to stimulate rural entrepreneurship. **WP3** identifies the most cost effective NPS to restore degraded lands that also produces important co-benefits, including poverty reduction. **WP4** identifies circular economy-based innovations that are most suited to the business, economic, and basic income needs of women and youth in rural areas. **WP5** will contribute by making explicit the true cost of food, hence creating the basis for investment in NPS but also by looking at payments/rewards schemes for ecosystem services (PES).

Measuring performance and results: NATURE+ aims at creating jobs and enhancing income opportunities, particularly for women and youth, through a number of value chains related to seeds, crops, fruit trees, waste, in addition to PES schemes, public procurement, such as school feeding programs. They will be measured in terms of the number of people benefitting, disaggregated by age and gender. In addition, policy makers will be engaged to be aware of the importance to support, through incentives, these efforts to boost rural entrepreneurship.

Partners: See Partner Annex here, differentiated by Innovation, Demand, and Scaling Partners and by Country.

Human resources and capacity development of Initiative team: The NATURE+ team will include a gender/social scientist, policy analysts, economists and financial advisors.

5.3 Gender equality, youth and social inclusion

Challenges and prioritization: During the COVID-19 pandemic, women, youth, and marginalized communities were some of the most negatively impacted, due to persistent inequalities, discrimination, and limited access to properties, incentives, subsidies, and information. NPS will address and clearly support inclusion of social groups, especially women and youth, throughout all its WPs.

Research questions: (WP1) What are the social incentive and governance systems that drive AWS conservation between generations (elders and youth) and how can these be strengthened? (**WP2**) How can markets be developed for neglected species and linked to farmers through value chains to improve income and promote better nutrition? (**WP3**) What are the most cost effective NPS to restore degraded lands, and what are the barriers to adoption, especially for women, (**WP4**) How can women and youth in rural areas be supported to develop and launch resource recovery businesses? What are the main barriers that hinder adoption of circular economy business models at scale? (**WP5**) What are the hidden costs to women of food production?

Components of Work Packages*:* WP1 will document gender-differential knowledge related to resources and conservation options. **WP2** will train women in entrepreneurship and facilitate their participation in value chains for seeds, NUS, and other natural capital of which women are traditional custodians. In addition, it will create opportunities through public procurement schemes, such as school feeding programs **WP3** explores how to remove gendered barriers and promote incentives for restoration that target women. **WP4** promotes agro-waste value chains and business opportunities for women and youth. **WP5** promotes gender and youth-sensitive access to PES and other tools.

Measuring performance and results: There will be several ways to measure results based on inclusion. At the general level, any plan to implement NPS packages will have to be complemented with traditional NPS practices, including from women, youth, and indigenous people. Such plans will therefore incorporate and reflect the needs of women and indigenous people. In addition, value chain development, training, and value chain access/participation will target women and youth in particular, the latter because they could benefit when modern communication technologies are used to develop business, and the former because they are the main custodian of many species and varieties. Third, women will be actively involved in the community steering committees to oversee implementation. Women and youth will also be targeted to manage farmers' led seed systems. Metrics will be either the number of women, youth and indigenous people employed in NPS value chains, the number of women in decision making positions, or the number of plans developed with the inclusion of women, youth and indigenous people perspective.

Partners*:* See Partner Annex here, differentiated by Innovation, Demand, and Scaling Partners and by Country.

Human resources and capacity development of Initiative team: The NATURE+ team includes a gender specialist and social scientists. New talent hired will take gender expertise into account.

5.4 Climate adaptation and mitigation

Challenges and prioritization*:* Climate change disproportionately affects vulnerable smallholder farmers because they are limited by a lack of resources with which to adapt. NATURE+ targets **climate adaptation** by building the resilience of farming communities through restoration of communal land and carbon-storing forests impacted by CC effects such as drought, and externalities such as over-exploitation, (**WP3**), diversification of production systems through agrobiodiversity (**WP2**), and improved management of soils and water systems in climate-stressed conditions (**WP1**). NATURE+ addresses **mitigation** by identifying agro-waste management options that reduce GHGE (**WP4**), while also recovering nutrients and organic matter to build resilience to climate change.

Research questions: (**WP1**) How can the conservation status of Agrobiodiversity, Water & Soils (AWS), be systematically and coherently measured to track multilevel changes - from genes to landscapes - in space and time? **(WP2**) How can production systems be designed to realize positive environmental, nutritional and production outputs, through optimal use of water, soil biodiversity, and biodiversity? (**WP3**) What are the most cost effective NPS to restore degraded lands that maximize multiple benefits, especially nutrition, carbon, biodiversity and water (AWS) whilst breaking the degradation cycle? (**WP4**) Which circular economy-based innovations in rural areas respond to priority local demands, needs and capacity, while maximizing benefits to rural communities, in particular poor women? (**WP5**) What is the true cost of current food production systems, taking externalities into account?

Components of Work Packages: Identification of key diversity, including traits that improve adaptive potential for communities (**WP1**). Design of integrated management practices that improve resilience and adaptation (**WP2**). Improved soil management and trees on-farm will also contribute to mitigation, which could be significant as shown in previous CCAFS research particularly in developing countries (**WP3, WP1**). Contribution to GHGE reduction through restoration activities, boosting absorption of carbon through better soil management and more trees in communal land (**WP3**). Supporting women and youth to launch recycling businesses, creating opportunities to improve waste management and increase access to new waste-based products such as composts which are essential for soil restoration and productivity (**WP4**). Incentive packages to support NPS adoption (**WP5**).

Measuring performance and results: NATURE+ will impact mitigation and adaptation through several pathways. Communities will improve their adaptation through the characterization of diversity for climate related traits (# of species and varieties characterized), and adoption of NPS practices by farmers, reducing their vulnerability to climate shocks (# of farmers adopting NPS packages). With regards to mitigation, improvements to restoration and soil management will be the main approaches used to create carbon sinks. Improved recycling and value chain will be a third pathway to reduce GHGEs. Finally, PES and other schemes will provide correctly aligned incentives to maintain forests and trees, contributing both to adaptation and mitigation.

Partners: See Partner Annex here, differentiated by Innovation, Demand, and Scaling Partners and by Country.

Human resources and capacity development of Initiative team: The NATURE+ team will include climate scientists, agronomists, policy analysts, economists, and financial advisors all familiar with climate adaptation and mitigation work.

5.5 Environmental health and biodiversity

Challenges and prioritization: Addressing the environmental impact of agriculture and reversing biodiversity loss, is at the core of NATURE+, which aims at promoting ZERO deforestation, ZERO degradation, MINIMAL carbon and water footprint, and enhancing biodiversity in production systems through: improved management of interactions between conservation and AWS (WP1), minimal land conversion (WP3) and better management of agro-waste (WP4). Reducing the overall environmental footprint of agriculture through 10 integrated community-based pilot cases is the ambition of the NATURE+ Initiative.

Research questions: ***(*WP1**) Can effective mutually beneficial links between (static) genebank conservation and (dynamic) in-situ conservation become integrated in such a way that it provides intelligence about gaps, coverage, and change? (**WP2)** How can production systems be designed to realize positive environmental, nutritional and production outputs, through optimal use of water, soil biodiversity, and biodiversity? (**WP3**) What degradative cycles impair ecosystem resilience and the delivery of ecosystem services at farm and landscape level and how can these be diagnosed by land users to engage in restoration partnerships with the financial sector? What are the most cost effective NPS to restore degraded lands that maximize multiple benefits, especially nutrition, carbon, biodiversity, and water (AWS) whilst break the degradation cycle? What are the ecosystem service delivery benefits of different NPS restoration interventions? And how can digital tools lift barriers to adoption? (**WP4**) Which circular economy-based innovations in rural areas, to respond to priority local demands, needs and capacity, while maximizing benefits to rural communities, in particular poor women? (**WP5**) What is the true cost of current food production systems, taking externalities into account? What payments/rewards for ecosystem services (PES) and other tools are most impactful for the adoption of NPS by key actors?

Components of Work Packages: All WPs will contribute to this. **WP1** will define a monitoring framework for biodiversity. **WP2** will improve management practices for AWS and investigate how the action plans will impact on the environment and natural resources by reducing the agricultural footprint and promote greater biodiversity (in pollinators and birds, for example). **WP3** will restore degrading environments and landscape connectivity, promoting use of local species for restoration to enhance biodiversity. **WP4** will reduce pollution by improving agro-waste management. **WP5** promotes ecosystem payment schemes and true cost accounting to create an enabling environment for greater investment in, and adoption of, NPS.

Measuring performance and results: A monitoring framework will be developed to monitor biodiversity and environmental performance. Specific indicators will be developed during the inception phase, to include wild, cultivated and soil biodiversity as well as other relevant indicators. The number of species will be constantly monitored using crowdsourcing approaches, while cultivated species will be mainly monitored through seed actors. Flow of ecosystem services across landscapes will be monitored using the same framework. We will measure reductions in damaging inputs, and improvements to recycling. We will also monitor the reduction of pollutants in the water and the environment.

Partners*:* See Partner Annex here, differentiated by Innovation, Demand, and Scaling Partners and by Country.

Human resources and capacity development of Initiative team: The NATURE+ team will include environmental scientists, engineers, policy analysts, economists, and financial advisors.

6. Monitoring, evaluation, learning and impact assessment (MELIA)

6.1 Result framework

CGIAR Impact Areas				
Nutrition, health and food security	**Poverty reduction, livelihoods and jobs**	**Gender equality, youth and social inclusion**	**Climate adaptation and mitigation**	**Environmental health and biodiversity**
Collective global 2030 targets				
The collective global 2030 targets are available centrally here to save space.				
Common impact indicators that your Initiative will contribute to and will be able to provide data towards				
# people benefiting from relevant CGIAR innovations.	# people benefiting from relevant CGIAR innovations.	# women benefiting from relevant CGIAR innovations # youth benefiting from relevant CGIAR innovations.	# tonnes CO2 equivalent emissions	# ha under improved management # ha deforestation
SDG targets				
2.2, 2.3, 2.4, 2.5	1.1, 1.2, 1.4, 1.5, 1.B	5.5, 5.C 8.2	13.1, 13.3	6.2, 6.3, 6.4, 6.B, 12.1, 12.2, 12.4, 12.A, 15.1, 15.3, 15.5
Action Area title: Resilient Agrifood Systems Shared Systems Transformation and Resilient Agrifood Systems Shared Systems Transformation, Resilient Agrifood Systems, and **Genetic Innovation**				
Action Area outcomes			**Action Area outcome indicators**	
Add Action Area outcomes			Add Action Area outcome indicators	
ST & RAFS 1 - Smallholder farmers implement new practices that mitigate risks associated with extreme climate change and environmental conditions and achieve more resilient livelihoods			STRAFSi 1.1 Number of smallholder farmers who have implemented new practices that mitigate climate change risks, disaggregated by gender and type of practice	
ST & RAFS 2 - National and local governments utilize enhanced capacity (skills, systems and culture) to assess and apply research evidence and data in policy making process			STRAFSi 2.1 Number of policies/ strategies/ laws/ regulations/ budgets/ investments/ curricula (and similar) at different scales that were modified in design or implementation, with evidence that the change was informed by CGIAR research	
RAFS 1 - Smallholder farmers use resource-efficient and climate-smart technologies and practices to enhance their livelihoods, environmental health and biodiversity			RAFSi 1.1 Number of resource-efficient and climate-smart technologies at stage IV (uptake by next user), disaggregated by type	
RAFS 2 - Research and scaling organizations enhance their capabilities to develop and disseminate RAFS-related innovations			RAFSi 2.1 Number of organizations	
RAFS 3 - Public and private financial resources are invested to fund climate-smart business models.			RAFSi 3.1 Total amount (USD) invested in climate smart business models	
ST & RAFS & GI 1 Women and youth are empowered to be more active in decision making in food, land and water systems			STi 1.1 - Number of farmers using climate smart practices disaggregated by gender	
			STi 1.2 - Number of farmers using agroecological practices disaggregated by gender	
			STRAFSGIi 1.2 Number of women, youth and people from marginalized groups who report input into productive decisions, ownership of assets, access to and decisions on credit, control over use of income, work balance, and visiting important locations	
Initiative and Work Package outcomes, outputs and indicators				

Result type	Result	Indicator	Unit	Geographic scope	Data source	Data collection method	Frequency of data collection	Baseline value (outcome only)	Baseline year (outcome only)	Target value	Target year
End of Initiative Outcomes											
EoI Outcome 1	Women and men smallholder farmers, local communities, and NARES in five LMICs use NPS stress-tested and validated by NATURE+ to improve landscape-scale management of biodiversity for food and agriculture (BFA) via the farmscale entry points of water, soil, waste, and land restoration.	# of smallholders and NARES using NPS, disaggregated by gender	Number	3 countries	Primary data source	Household questionnaires	Baseline and end-of-Initiative	0	2022	At least 5,000 smallholders each in target country and one NARES per country	2025
EoI Outcome 2	Women and men (incl. smallholder farmers) in five LMICs use NATURE+ 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.	# of smallholders NPS, disaggregated by gender	Number	3 countries	Primary data source	Household questionnaires	Baseline and end-of-Initiative	0	2022	At least 5,000 smallholders in target sites	2025
EoI Outcome 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	# of NARS	Number	Global	Primary data	Key Informant Interviews	Baseline and end-of-Initiative	0	2022	5	2025
EoI Outcome 4	National and subnational policymakers in five LMICs acknowledge that true cost accounting should and will be applied to AFS-related policy formation	# of policy makers supporting NPS	Number	Global	Primary data	Key Informant Interviews	Baseline and end-of-Initiative	0	2022	5	2025
EoI Outcome 5	Public and private investment actors use NATURE+ evidence, tools, and methodologies to gain a better understanding of the business case for NPS	# of investment actors disaggregated by gender	Number	Global	Primary data	Key Informant Interviews	Baseline and end-of-Initiative	0	2022	5	2025
Work Package 1											
Outcome 1.1	Researchers and practitioners use semi-standardized tools and key	Number of tools and replication rate of metrics	Number	All target	Primary	Initiative Records	Yearly	0	2022	5	2025

	metrics for agrobiodiversity-water-soil conservation monitoring			countries							
Outcome 1.2	Genebank curators and communities of landrace and CWR custodians collaborate interactively on conservation	Number of collaborative initiatives	Number	All target countries	Primary	Initiative Records	Yearly	0	2022	5	2025
Outcome 1.3	Conservation practitioners use and expand best-bet practices	Number of practices and active users	Number	All target countries	Primary	Initiative Records	Yearly	5 / 150	2022	>15/>1500	2025
Outcome 1.4	Education actors, family and youth revalue and apply traditional agrobiodiversity-water-soil conservation knowledge	Number of schools involved	Number	All target countries	Primary	Initiative Records	Yearly	0	2022	>50	2025
Outcome 1.5	Stewards of agrobiodiversity-water-soil receive direct (non-) monetary incentives for the ecosystem services they provide	Number of incentive models supported by public and private sector	Number	All target countries	Primary	Initiative Records	Yearly	0	2022	>5	2025
Output 1.1	Multilevel AWS conservation monitoring toolboxes and metrics	Number of tools and users	Number	All target countries	Primary	Evaluation surveys	Mid-point	N/A	N/A	>10/>500	2024
Output 1.2	Multilevel agrobiodiversity-water-soil conservation baselines and open-access decision-support platforms for conservation decision support	Number of baseline / platforms	Number	All target countries	Primary	Evaluation surveys	Mid-point	N/A	N/A	10	2024
Output 1.3	A network on AWS observatories for systematic conservation monitoring and action	Number of observatories	Number	All target countries	Primary	Reports per site	Yearly	N/A	N/A	8	2025
Output 1.4	Active flows of genetic resources, information and benefits between ex- and in-situ conservation programs	Number of accesions exchanged (into ex-situ or vice versa)	Number	All target countries	Primary	Registers / in-situ inventories	Mid-point	N/A	N/A	>200	2025
Output 1.5	Best-bet conservation practices systematized and available for scaling	Number of practices and number of users	Number	All target countries	Primary	Surveys	Yearly	N/A	N/A	>10/>500	2025
Output 1.6	Guidelines for conservation through youth engagement (including within formal intercultural education)	Number of schools participating	Number	All target countries	Primary	Registers	Mid-point	N/A	N/A	>25	2025
Output 1.7	Portfolio of practical evidence-based incentives for community-based conservation action and governance	Number of distinct PES or ABS incentives and	Number	All target	Primary	Surveys	Mid-point	N/A	N/A	>10/20	2025

		farmer groups reached		countries							
Work Package 2											
Outcome 2.1	Men and women farmer are increasingly relying on local seed actors for high quality seeds	Number of farmers	Number	All target countries	Primary/secondary	Key informant interviews	End point	0	2022	To be decided At least 5,000 in countries with existing community seed bank systems	2025
Outcome 2.2	Men and women farmer in the communities will coordinate their efforts to produce a diversity of crops	Number of collaborative frameworks	Number	All target countries	Primary	Evidence of community agreement	Mid-point	0	2022	10	2025
Outcome 2.3	Men and women farmer in target sites use integrated soil, water, biodiversity protocols	Number of farmers	Number	All target countries	Primary	Survey of activities implemented	End point	0	2022	10	2025
Outcome 2.4	Youth and women will benefit from these value chains and public procurement in terms of jobs and income	Increase in income from value chains	income	All target countries	Primary	Survey	End point	0	2022	20% increase	2025
Outcome 2.5	Local policy promotes NPS production	Number of policy makers supporting NPS	Numbers	All target countries	Primary	Evidence from public statements/interviews	End point	0	2022	5	2025
Output 2.1	Informal seed systems in place	Number of farmers' led seed units	Number	All target countries	Primary	Reports of established local seed producers	end point	N/a	N/A	10	2025
Output 2.2	Multistakeholder platforms in place	Number of platforms	Number	All target countries	Primary	Reports from platforms meeting	Year 1	N/A	N/A	5	2023
Output 2.3	Performance metrics are in place for NPS monitoring	Number of farmers' led seed units	Number	Global	Primary	White paper/publications	Year 1	N/A	N/A	1	2023
Output 2.4	Integrated protocols in place for use of biodiversity, pests and diseases, management (marginal quality) water and soil specific for each location	Number of protocols	Number	All target countries	Primary	Evidence of protocols	Year 2	N/A	N/A	10	2023
Output 2.5	Agreed action plan with integrated NPS protocols implemented	Number of action plans	Number	All target	Primary	Evidence of implement	Year 1	N/A	N/A	10	2023

				counties		ation agreements					
Output	Protocols for Participatory Variety Selection (PVS) and Participatory Plant Breeding (PPB)	Number of protocols	Number	All target counties	Primary	Evidence of protocols	Year 1	N/A	N/A	5	2023
Output 2.6	Value chains for biodiversity markets in place	Number of value chains established	Numbers	All target countries	Primary	Market survey	End point	N/A	N/A	5	2025
Output 2.7	Public procurement from smallholder farmers (e.g., school feeding) in place.	Number of public procurement schemes	Numbers	All target countries	Primary	Evidence of public procurement agreements	End point	N/A	N/A	5	2025
Work Package 3											
Outcome 3.1	Restoration NPS kits codeveloped with communities, NGO's and extension agencies	Communities use NPS kits	Number	All target countries	Primary	Survey	End Point	0	2022	25	2025
Outcome 3.2	Community groups, including Men, Women and Youth, are leading cost effective and climate resilient restoration of degraded lands	Community led NPS interventions	Number	All target countries	Primary	Survey	End Point	0	2022	25	2025
Outcome 3.3	Living restoration demonstration sites coupled to virtual resource centers	Farmers accessing resource and skills on NPS Restoration	Number	All target countries	Initiative progress report			0	2022	100	2025
Outcome 3.4	Increased capacity to implement NPS and monitor/ quantify benefits support great engagement with private sector and investors	Increase in adoption of NPS	Number	All target countries	Initiative progress report	Survey	End point	0	2022	25	2025
Output 3.1	Living restoration demonstration landscapes that empower communities to achieve resilient restoration	Number of restoration landscapes	Number	All target countries	Primary		Mid-point and End point	N/A	N/A	10	
Output 3.2	Rapid, cost effective and entrepreneurial restoration opportunities. Spatially explicitly planning tools to determine the multiple benefits of NPS	Number of spatially explicit planning tools	Incentives to change behaviors	All target countries	Primary	Surveys	Mid-point and End point	N/A	N/A	10	2025

Output 3.3	NPS to de-risk restoration interventions. Using genetic diversity as the foundation for adaptive restoration	Number of species and population identified for restoration		All target countries	Initiative progress report	Surveys	End/point	N/A	N/A	200	2025
Output 3.4	Deploying D4R to catalyze nature positive solutions to restoration of degraded lands through linking revived traditional ecological knowledge	Number of seedlings units	Number of groups applying the tools	All target countries	Primary	Surveys	Mid-point and End point	N/A	N/A	10	2025
Work Package 4											
Outcome 4.1	Awareness is raised within communities on the opportunities with rural waste recycling	Number of people reached	Number	Global and per country	Initiative progress report	Initiative Records	Annual	0	2022	5,000	2025
Outcome 4.2	Women and youth are aware and able to implement businesses for waste recycling	Number of resource-efficient and climate-smart technologies at stage IV (uptake by next user), disaggregated by type	Number	Global	Initiative progress report	Initiative and business records	Annual	0	2022	3	2025
		Number of a) women; b) youth; and c) people from marginalized groups who report input into productive decisions	Number	Global	Initiative progress report	Initiative and business records	Annual	0	2022	a) 100 b) 300 c) 50	2025
		Number of smallholder farmers who have implemented new practices that mitigate climate change risks, disaggregated by gender and type of practice	Number	Global	Initiative progress report	Initiative Records	Annual	0	2022	100 (20% female)	2023
Outcome 4.3		Number of young entrepreneurs	Number	Global	Initiative	Initiative and	Annual	0	2022	15	2025

	Selected young entrepreneurs and women are coached and they set-up SMEs to recycle rural waste	and women coached		and per country	progress report	business records					
		Total amount (US$) invested in climate smart business models	US$	and per country	Initiative progress report	Initiative and business records	Annual	0	2022	US%200,000	2025
		Number of SMEs launched	Number	Global and per country	Initiative progress report	Initiative and business records	Annual	0	2022	15	2025
		Volume of rural waste processed annually	Tonnes or m^3 per year	and per country	Initiative progress report	Initiative and business records	Annual	0	2022	1,000	2025
Outcome 4.4	Waste recycling is mainstreamed into national policies and practices	Number of a) policies, strategies, laws, and regulation; b) budgets, investment; c) curricula (and similar) at different scales that were modified in design or implementation	Number	Global and per country	Initiative progress report	Initiative Records	Annual	0	2022	a) 2 b) 1 c) 2	2025
		Total amount (US$) invested in climate smart business models	Number	Global and per country	Initiative progress report	Initiative Records	Annual	0	2022	US$5 million	2025
Output 4.1	Catalogue of co-designed business models for rural typologies	Number of resource-efficient and climate-smart business models at stage IV (uptake by next user), disaggregated by type	Number	Global	Initiative progress report	Initiative Records	Annual	N/A	N/A	10	2023

Output 4.2	Decision-support tool for selection of suitable business model for any given specific context	Number of decision-support tool	Number	Global	Initiative progress report	Initiative Records	Annual	N/A	N/A	1	2025
Output 4.3	Uptake centers set up to train and coach women and youth in commercial waste recycling business management.	Number of uptake centers	Number	Global	Initiative progress report	Initiative Records	Annual	N/A	N/A	5	2025
Output 4.4	Guide for the implementation of circular economy solutions	Number of user guide developed	Number	Global	Initiative progress report	Initiative Records	Annual	N/A	N/A	1	2025
Output 4.5	Generic business plans developed to be used according to the plug-and-play approach	Number of business plans developed	Number	Global and per country	Initiative progress report	Initiative Records	Annual	N/A	N/A	10	2025
Work Package 5 Engage											
Outcome 5.1	Public and private investors improve NPS priority setting and decision-making	Analytical tools	Number	All target countries	Initiative progress report	Initiative records	End point	0	2022	10	2025
Outcome 5.2	Program implementers use decision tools for payments/rewards for ecosystem services	Tools developed	Number	All target countries	Initiative progress report	Initiative records	End point	0	2022	5	2025
Outcome 5.3	Governments lead creation of multi-stakeholder platforms for NPS co-development	Guidance materials	Number	Global	Initiative progress report	Initiative records	End point	0	2022	5	2025
Outcome 5.4	Program implementers use modules that engage marginalized groups in NPS	Modules developed	Number	All target countries	Initiative progress report	Initiative records	Annual	0	2022	5	2025
Outcome 5.5	Policymakers implement recommendations on scaling in each country	Recommendations developed	Number	All targeted	Imitative progre	Initiative records	End point	0	2022	5	2025

				countries	ss report						
Output 5.1	Analytical tools to inform priority-setting and investment decision-making	RAFS 3RAFSi 2.1	Number	All target countries	Primary	Initiative records	Once (Ex-post)	N/A	N/A		2023
Output 5.2	Decision tools for payments/ rewards for ecosystem services	Decision tools	Number	All target countries	Primary	Initiative records	Once (Ex-post)	N/A	N/A	1	2025
Output 5.3	Guidance on determinants and obstacles to adoption of NPS	Determinants of adoption	Number	All target countries	Primary data collected through Initiative	Key informant interviews, focus group discussions and structured surveys	Once (Ex-post)	N/A	N/A	1	2025
Output 5.4	Capacity strengthening modules to engage marginalized in NPS	Number of modules developed	Number	All target countries	Initiative progress report	Initiative records	Annual	0	N/A	5 (1 per country)	2023-2025
Output 5.5	Guidance on scaling of NPS solutions	Guidance documents	Number	All target countries	Initiative progress report	Initiative records	Mid and end point	N/A	N/A	1	2025
Output 5.6	Multistakeholder platforms for NPS co-development	Number of platforms	Number	All target countries	Initiative progress report	Initiative records	End point	N/A	N/A	5 (1 per country)	2025
Innovation Package and Scaling Readiness Plan	Documented scaling ambition for different core innovations, vision of success and Scaling Readiness roadmap	Number of Core innovation with scaling plan	Number	All target countries	Primary data	Initiative records	Annual	N/A	N/A	10	2025
Innovation Package and Scaling Readiness Plan	`Scaling readiness reports for selected Innovation Packages based on evidence	Number of Innovation Packages scaling ready	Number	All target countries	Primary data	Initiative records	Annual starting from year 2	N/A	N/A	5	2025

6.2 MELIA plan

a. MEL plans

Monitoring data will be collected throughout the Initiative's life cycle using a tracking tool compatible with the One CGIAR System Dashboard. The monitoring system will enable the MELIA team to monitor activities and outputs occurring along the Initiative's sphere of control and will enable the Initiative to guide the research activities toward the achievement of outcomes at the Initiative and Action Area level (detailed in Section 6.1) along the sphere of influence. In this way, the MELIA team will play a key role in nesting the Initiative's cumulative contribution within the Action Area level, by documenting progress along the Impact Pathway that will provide evidence of the influence of Initiative outputs towards outcome achievements. Formal reviews of the Initiative's progress with respect to the TOC will be conducted every six months, to assess how proposed outputs are contributing towards proposed outcomes, and to determine to what extent assumptions behind the Initiative's TOC are confirmed or rejected. This will allow the Initiative to implement iterative, dynamic management that ensures activities remain relevant and focused on outcome delivery. Moreover, the MELIA team (in collaboration with WP5) will implement two different adoption studies to collect qualitative data to determine the level of adoption of the innovations promoted by NATURE+. The aim of the first adoption study is to assess the current level and status of adoption of NPSs, as well as the determinants of and obstacles to adoption of such practices. The results will provide the opportunity to (i) learn from ongoing and previous work about NPS, and (ii) to provide insights for scaling out NPS to other countries. The latter of the two will be implemented in 2024 in two target countries: India and Kenya.

This will allow NATURE+ to answer the following learning questions:

a. How is our sphere of control changing?
b. Are we targeting the right stakeholders to influence policy change? Are our innovations responding to their needs?
c. Are we measuring our progress and success in the most effective manner?

b. Impact assessment plans

The Impact Assessment strategy will answer the following research questions:

a. Are Initiative's innovations and research outputs properly informing and influencing the targeted stakeholders to enable them to become key agents of change agents?
b. To what extent has the policy dialogue around NPSs changed, and related systems shifted in relation to our findings?
c. Are new policies being developed thanks to the innovations generated by this Initiative?

Ad hoc methodologies and approaches will be used — depending on the nature of the interventions and assuming funding allows — to ensure NATURE+ is fully responsive to those three impact questions. Key NPS will be selected in the collection of baselines for an ex-post impact assessment to evaluate the effects generated by the key innovations after the end of the Initiative. The baselines will be collected in 2023 in Colombia, India, and Kenya. The results will provide insights for future designs of NPS programs within CGIAR and will empower scientists, funders, policymakers, business partners, and civil society to incorporate this evidence in the narrative of their strategies and action plans.

6.3 Planned MELIA studies and activities

Type of MELIA study or activity	Result or indicator title that the MELIA study or activity will contribute to	Anticipated year of completion (based on 2022-24/25 Initiative timeline)	Co-delivery of planned MELIA study with other Initiatives	How the MELIA study or activity will inform management decisions and contribute to internal learning
Monitoring activity	Contributes to Initiative outcomes and outputs	2022 - Continued application until 2025	N/A	MELIA monitoring will help to trace and consolidate the information to evaluate the contribution of the Initiative to each of the Impact Areas.
Adoption studies	Determinants of and obstacles to the adoption of existing NPS	2 Studies in 2023	N/A	These studies will provide key learnings about drivers motivating, limiting or impeding adoption of current NPSs by farmers, consumers, NGOs, scientists, and investors. The findings will be incorporated into the Initiative's strategies and plans.
	Number of partners adopting institutional innovations from the Initiative.	2 Studies (India and Kenya) in 2024	N/A	Through qualitative data, surveys, and interviews, the MELIA team will assess the level of adoption of the innovations promoted by the Initiative. If users in the sphere of interest are not using the Initiative's outputs as planned, the MELIA team will endeavor to understand why and how to solve the problem.
Baseline (ex-post) studies	Contributes to Initiative outcomes and outputs	3 Baselines (Colombia, India, and Kenya) in 2023	N/A	The MELIA team will generate a report assessing the status quo of the NPS considered by the Initiative. Quasi-experimental evaluation methods will be implemented, based on the Intervention's characteristics, in order to quantify the effects that NPS can have on the CGIAR's impact indicators.

7. Management plan and risk assessment

7.1 Management plan

At inception stage, we will establish a **Global Steering Committee** (GSC) composed of the Initiative leader and co-leader, selected senior members of partner organizations, and one political representative per country, which will provide high-level strategic guidance to the work of NATURE+, including reviewing progress against MELIA plans. The GSC will be supported by a **Global Technical Unit** (GTU), consisting of WP leaders, the Initiative leaders, scientists from participating organizations, a representative from each target country, a MELIA expert, and a scaling expert.

The GTU will be responsible for all technical aspects of NATURE+ implementation, such as advising the multi-stakeholder platforms. The GTU will also manage the day-to-day coordination, monitoring, and high-level reporting tied to delivery of NATURE+ outputs. The GTU will practice adaptive management, following a results-based management approach to remain flexible and responsive to emerging opportunities in a fast-changing work environment. Each WP leader is responsible for accomplishing the individual targets of that WP towards Action Area and CGIAR-level impacts, with the support of the MELIA Coordinator.

MELIA will be treated as a research component, where we test and update our TOC. Activities will, therefore, be carried out from inception and throughout the research planning and delivery cycle to maintain or improve Initiative performance over time. MELIA will also capture key feedback from next users (the immediate target group) of NATURE+ deliverables, and monitor identified/new risks as well as implementation of mitigation strategies. Hence, MELIA activities will provide continuous assessment of the project's overall TOC and ensure alignment of the Initiative's research plan with its outreach objectives.

7.2 Summary management plan Gantt table

Initiative start date	Timelines												
	2022			2023				2024				2025	
WPs	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	
WP1: Conserve		1.1			1.2					1.3			**1.1** Multilevel AWS conservation monitoring toolboxes and metrics in online platform (protocols, manuals, datasheets); **1.2** Series of landrace diversity gap analysis reports for in-situ versus *ex-situ* populations to define unique coverage and complementarity; **1.3** Published guidelines and citizen science app for dynamic agrobiodiversity and traditional knowledge conservation through youth engagement at schools.
WP2: Manage				2.1					2.2			2.3	**2.1** Multistakeholder platforms are established, and they agree on action plans for each community; **2.2** At least one seed actor established in each country, strengthening farmers' led seed actors; **2.3** At least one new value chain/public procurement agreement in each country.
WP3: Restore								3.1		3.2	3.3		**3.1** Restoration toolkits using D4R developed for Community organizations, including those representing marginalized community members; **3.2** Living restoration demonstration sites coupled to virtual resource centers; **3.3** Seed Zone Maps, and report of valuable genetic resources for NPS, Business cases and value-chain innovations for under-utilized and neglected native biodiversity, e.g., through diverse 'seed' value chains
WP4: Recycle							4.1	4.2				4.3	**4.1** Catalogue of co-designed business models: compendium of agro-waste recycling solutions that are safe, resilient, profitable, and adapted to rural conditions; **4.2** National Uptake center: A facility that trains on recycling practices, access to funding for investment, marketing and use of waste-based products; **4.3** Guide for the implementation of circular economy solutions in rural areas: A roadmap for wider adoption of rural waste recycling.
WP5: Engage											5.1 5.2 5.3		**5.1** Analytical tools to inform priority-setting and investment; **5.2** Decision tools for payments/ rewards for ecosystem services; **5.3** Multistakeholder platforms for NPS co-development
Innovation Packages & Scaling Readiness		x		x		x		x		x		*x*	*x: Half-yearly reviews to inform activities, implement supporting activities (e.g., science/policy dialogues) and innovation management and address bottlenecks.*
MELIA		x		x		x		x		x		*x*	*x: Half-yearly meetings for project management & resource allocation; engagement with key partners to ensure co-design*
Project management	A					B						C	***A** Start-up meetings in target countries/regions and contracting; **B** Mid-term review; **C** Final meeting, design of future project phases*

7.3 Risk assessment

Top 5 risks to achieving impact	Description of risk	Likelihood	Impact	Risk score Likelihood x Impact	Mitigations
		Rate from 1-5	Rate from 1-5		
Farmers, value chain actors, and policy makers do not commit to a nature positive transformational agenda (WP 1 to 5)	NPS builds on the assumption that we will be able to engage relevant stakeholders within the 10 sites to enable a NPS agenda. This requires a high level of collaboration. However, some of the stakeholders, including policy makers, may be unwilling to participate and could undermine it	3	5	15	We will ensure that a clear framework for the Initiative will be made available to all partners and stakeholders. It will be also important to explain the relevance of true cost of food as a guide for incentives and investments
Natural disaster, civil unrest and diseases outbreaks (WP 1 to 5)	Some of the countries in which we will implement NPS are prone to all those risks. Local or more national social unrests remains a possibility as well as the possibility of natural disasters.	2	4	8	Ensure that local teams are strong and they can continue operating during the crisis. Develop a strong virtual communication method
Lack of capacity in the CGIAR or other partners to operationalize such innovative agenda (WP 1 to 5)	NPS is a new concept and so is the idea of using true cost of food as a guide to drive incentives and attract investors. However, some isolated aspects of NPS are being addressed in a range of ongoing initiatives implemented by CGIAR and partners.	1	4	4	Ensure that nature positive solutions and approaches that are selected for implementation are adapted to local capacity, and if necessary, support capacity development to fill any possible gap
Inability to reach a consensus in the co-creation process (WP 1 to 4)	The NPS concept will rely on co-development with local communities and actors of an action plan to be implemented in each of the targeted sites. For each WP, about three core innovations will be identified based on stakeholder preference and feasibility and scaling readiness assessment	1	5	5	Ensure that the communities selected understand and support the process to be followed in the Initiative. Develop strong communication channels, and involve community leaders, to enable adequate information dissemination
Inability to enforce suitable incentives – farmers' economic interests durably undermined by adoption of NPS (WP 1 to 5)	The adoption of NPS could affect revenues of farmers. In some cases, they need to be compensated for revenue loss or extra work requirement. In the absence of suitable incentives, their interest to adopt NPS may fade with time.	2	5	10	Engage with policy actors early in the project implementation process, and jointly gather science-based impact assessment results to support proposed changes. Demonstrate a positive benefit cost ratio exceeding 1 for any proposed intervention.

8. Policy compliance, and oversight

8.1 Research governance

Researchers involved in the implementation of this Initiative will comply with the procedures and policies determined by the System Board to be applicable to the delivery of research undertaken in furtherance of CGIAR's 2030 Research and Innovation Strategy, thereby ensuring that all research meets applicable legal, regulatory and institutional requirements; appropriate ethical and scientific standards; and standards of quality, safety, privacy, risk management and financial management. This includes CGIAR's CGIAR Research Ethics Code and to the values, norms and behaviors in CGIAR's Ethics Framework and in the Framework for Gender, Diversity and Inclusion in CGIAR's workplaces.

8.2 Open and FAIR data assets

Researchers involved in the implementation of NATURE+ shall adhere to the terms of the Open and FAIR Data Assets Policy. NATURE+ will align with the OFDA Policy's Open and FAIR requirements, ensuring:

- Rich metadata conforming to the CGIAR Core Schema to maximize Findability, including geolocation information where relevant.
- Accessibility by utilizing unrestrictive, standard licenses (e.g., Creative Commons for non-software assets; General Public License (GPL))/Massachusetts Institute of Technology (MIT) for software), and depositing assets in open repositories.
- Wider access through deposition in open repositories of translations and requiring minimal data download to assist with limited internet connectivity.
- Interoperability by annotating dataset variables with ontologies where possible (controlled vocabularies where not possible).
- Adherence to Research Ethics Code (Section 4) relating to responsible data (through human subject consent, avoiding personally identifiable information in data assets and other data-related risks to communities).

9. Human resources

9.1 Initiative team

Category	*Area of expertise*	*WPs*	*Short description of key accountabilities*
Research	Agricultural. advisory specialist /agronomist	WP1-2	Develop and monitor spatial organization on farm and landscape
Research	Anthropologist/ethnobotanist	WP1	Document ethnobotanic information
Research	Biodiversity expert	WP1-3	Describe and characterize biodiversity
Research	Capacity expert	WP5	Develop training and extension packages
Research	Participatory Research Expert	WP1-3	Develop participatory research protocols
Research	Civil Engineer	WP4	Supervise the establishment of the National Uptake Centers
Research	Crop scientist	WP2	Develop PPB schemes and manage on farm experiments
Research	Ecologist and landscape scientist/environmental scientist	WP3-5	Develop framework and monitor ecosystem services
Research	Education specialist	WP1	Develop and implement education programs
Research	Economist	WP1-5	Cost-benefit analysis, market demand, cost-benefits, return on investments, NPS impact assessment

Research	Farm and ecological modeler	WP3	Develop and implement crop rotation and intercropping schemes
Research	Financial advisor	WP4	Support early adopters with implementation of waste-based business models to ensure sustainability
Research	Gender and diversity specialist	WP1-5	Ensure Gender and inclusion are key in project implementation and co-design of solutions
Research	Geneticists and Genetic resources expert/FGR	WP1-3	Characterize genetic diversity, including nutrition, agronomic, genetic and farmers' evaluation
Research	Impact assessment specialist	WP1-5	Manage IA component
Research	InVEST modeler	WP5	
Research	Livestock scientist	WP3	Develop and implement rangeland management
Research	Market and Marketing expert	WP2	Support and manage development of value chains
Research	Nutrition Specialist	WP2	Support and manage nutrition education and outputs
Research	Pest and diseases expert	WP2	Develop
Research	Policy advisor	WP2, 4	Advise on strategies to include and influence policies in implementation guide
Research	Scaling expert	WP1, 4-5	Support the scaling up and scaling out of NPS
Research	Seed system specialist	WP1-3	Develop and manage farmer-led seed systems
Research	Social Scientist	WP2-4	Develop and implement programs to understand factors affecting adoption
Research	Soil biodiversity scientist	WP1-3	Develop and manage monitoring tools for soil biodiversity
Research	Spatial analyst	WP1-3	GIS expert to model and monitor the communities
Research	Value chain expert	WP2-4	Develop value chains and train in rural entrepreneurship
Research	Water resources scientist	WP1-3	Develop water resources conservation and use schemes
Research support	Communication specialist/website developer	WP5	Communicate Initiative results and develop web site
Research support	Communications	WP1-5	Support communication ad dissemination of project findings
Research support	Data scientist	WP1-5	Develop data management strategy
Research support	Software engineer and programmer	WP1, 4	Conceptualize with researcher user-friendly tools
Research support:	Program administration (secretarial support, HR and Finance)	WP1-5	Support Initiative implementation and management
Research MELIA	MELIA specialists	WP1-5	Monitor, evaluate and document progress toward outputs and outcomes; indicator frameworks; document learnings and impact (including projections); oversee and support external evaluations reviews (including Scaling Readiness assessments)

9.2 Gender, diversity and inclusion in the workplace

Continuing current practice in our research teams and the example set by the One CGIAR, the leadership of NATURE+ is evenly balanced (one male, one female as Co-Leads). Of the 15-member Initiative Design Team, 60% (nine professionals) are female, while 40% (six professionals) are male, thus easily meeting the CGIAR's gender target of a minimum of 40% women in professional roles. The team is also composed of individuals from diverse national/cultural/ethnic and disciplinary backgrounds. Once NATURE+ launches and permanent positions on the team are announced, we will use the GDI Inclusive Recruitment Toolkit to craft terms of references and position openings that actively encourage women and applicants from historically underrepresented ethnic or national backgrounds to apply. The Initiative team includes a Gender Specialist, who will monitor all recruitment to ensure an adequate balance between women and men for professional roles in the GSC and GTU, as well as the Initiative team at large. The Initiative will use best practices within the CGIAR to establish and implement professional

development, mentoring, and leadership development tracks for women, minorities, and other underrepresented groups during Initiative development (by 2025).

9.3 Capacity development

Capacity building is a cornerstone of the NATURE+ TOC. It includes:

(**WP1**): Development of guidelines for education actors (Ministries of Education, NARES) on how to mainstream updated conservation learning, tools, and methodologies into formal intercultural and intergenerational education programs, with a specific focus on (i) effective elder-youth learning; and (ii) the blending of high-tech tools and learning with traditional AWS knowledge on the ground.

(**WP2**): Based on training need assessment, training protocols, including extension manual, will be developed on (i) seed systems; (ii) crop rotation and intercropping; (iii) PPB and PVS; (iv) citizen science approaches; (v) pests and diseases management; (vi) soil management; (vii) water management; (viii) participatory monitoring; (ix) rural entrepreneurship; and (x) value chain. The trainings will be available through extension to the population. However, the project will particularly focus on the farmers involved in the cluster.

(**WP3**): Using transdisciplinary systems research and co-learning, WP3 will build capacity of community groups to restore communal degraded lands more effectively. This will be implemented via the establishment of restoration living labs (RLLs) where restoration innovations are demonstrated, evidenced, incentivized and resourced (germplasm, soil conservation and land management, agricultural practices, digital tools, locally contextual models, etc.)

(**WP4**): Training needs assessment, trainings, technical assistance, and development of a practical technological guide (by rural typology and farm size), all designed to enable smallholders to introduce and implement waste management innovations that are technically sound, financially and economically profitable, socially acceptable and environmentally sustainable.

(**WP5**): Work with farmer organizations, local government, grassroots organizations and private sector actors to strengthen the capacity of key actors to identify and advocate for a stronger enabling environment for NPS.

The NATURE+ Initiative team leaders and managers will complete training on inclusive leadership within three months of launch. Within six months of launch, NATURE+ team members will complete training on gender, diversity, and inclusion, including on whistleblowing and how to report concerns. The Initiative kick-off will include an awareness session on CGIAR's values, code of conduct and range of learning opportunities available within CGIAR.

10. Financial resources

10.1 Budget

10.1.1: Activity breakdown

USD	2022/2023	2023/2024	2024/2025	Total
Crosscutting across Work Packages	150,000	200,000	250,000	600,000
Work Package 1	1,501,749	2,143,497	2,665,658	6,310,904
Work Package 2	1,371,601	1,391,768	1,534,160	4,297,529
Work Package 3	896,597	1,101,664	1,215,237	3,213,498
Work Package 4	1,332,811	1,565,165	1,675,842	4,573,818
Work Package 5	1,315,912	1,964,482	2,329,530	5,609,924
Innovation packages & Scaling Readiness	50,000	200,000	250,000	500,000
Total	6,618,669	8,566,576	9,920,428	25,105,673

10.1.2: Geographic breakdown

USD	2022/2023	2023/2024	2024/2025	Total
Global (not specific country)	992,800	1,284,986	1,488,064	3,765,851
Burkina Faso	1,125,174	1,456,318	1,686,473	4,267,964
Colombia	1,125,174	1,456,318	1,686,473	4,267,964
India	1,125,174	1,456,318	1,686,473	4,267,964
Kenya	1,125,174	1,456,318	1,686,473	4,267,964
Vietnam	1,125,174	1,456,318	1,686,473	4,267,964
Total	6,618,669	8,566,576	9,920,428	25,105,673

11. Online annexes

1. Annex 1 – List and description of detailed description of the NPS innovations.
2. Annex 2 – Country reports
3. Annex 3 – Country stakeholders consultation reports
4. Annex 4 – Projected benefit sources of information and calculation summary
5. Annex 5 – Projected benefits detailed calculations by target country
6. Annex 6 – Prioritized sites of NATURE+ Initiative
7. Partner annex – detailed list of partners

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