# SOIL VALUES

**Proposal in response to the Soil Fertility Grant Program**
**submitted to Netherlands Directorate-General for International Cooperation**

10 August 2023

IFDC
Developing Agriculture from the Ground Up

SNV

WAGENINGEN
UNIVERSITY & RESEARCH



AGRA
Sustainably Growing Africa's Food Systems

World Agroforestry

IITA
Transforming African Agriculture

ISRIC
World Soil Information

IWMI
International Water Management Institute

# SOIL VALUES

Proposal submitted by the International Fertilizer Development Center (IFDC) on behalf of a Consortium composed of IFDC, SNV, and Wageningen University & Research

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For ease of review of the proposal, a checklist is provided in the first annex (attached separately), mapping the requirements of the SFGP Call onto the specific sections of the proposal where these requirements are addressed.

# Contents


Executive Summary ..... 1

1. Introduction ..... 5

2. Organizational Capacity ..... 8

3. Context and Problem Analysis ..... 10
   - 3.1. Overview ..... 10
   - 3.2. Soil Fertility Factors ..... 10
   - 3.3. Watersheds and Landscapes ..... 13
   - 3.4. Climate Change ..... 14
   - 3.5. Gender Equality and Social Inclusion ..... 15
   - 3.6. Conflict ..... 16
   - 3.7. Institutional and Policy Landscape ..... 17
   - 3.8. Financial Services ..... 18

4. Country Selection and Targets ..... 19
   - 4.1. Country Selection ..... 19
   - 4.2. Trade and Food Availability Considerations ..... 20
   - 4.3. Setting Country Targets ..... 20
   - 4.4. Justifying Equitable Outcomes ..... 21

5. Intervention Activities ..... 22
   - 5.1. Collaboration with National Partners ..... 23
   - 5.2. Intervention Area 1: ISFM Bundled Services and Sustainable Delivery ..... 23
   - 5.3. Intervention Area 2: Integration and Co-Design Community and Watershed Approaches ..... 27
   - 5.4. Intervention Area 3: Brokering Finance ..... 28
   - 5.5. Intervention Area 4: Convening ..... 31
   - 5.6. Intervention Area 5: Scoping Innovations and Program Learning ..... 32
   - 5.7. Program Workplan – Overview of 1-, 5- and 10-Year Plans ..... 34
   - 5.8. Country Implementation Plans ..... 36

6. Monitoring, Evaluation, Learning and Sharing (MELS) ..... 37
   - 6.1. Theory of Change and MELS ..... 37
   - 6.2. MELS Approach and Framework ..... 38
   - 6.3. Results Framework ..... 40
   - 6.4. MELS Activities and Timelines ..... 41
   - 6.5. Responsibilities for MELS ..... 42
   - 6.6. Data Management ..... 43
   - 6.7. Risk Monitoring and Adaptive Management ..... 44

7. Consortium Roles and Program Governance ..... 45
   - 7.1. Overview of Partner Roles ..... 45
   - 7.2. Complementary Areas of Expertise ..... 46
   - 7.3. Consortium-Level Governance ..... 50

8. Program Management Approach ..... 51
   - 8.1. Operating in a Conflict Setting ..... 52
   - 8.2. Program Leadership and Staffing ..... 52
   - 8.3. Risk Management ..... 54

9. Soil Values Program Budget and Value for Money ..... 55
   - 9.1. Soil Values Program Budget ..... 55
   - 9.2. Value for Money ..... 56

## Abbreviations and Acronyms

| | |
|---|---|
| 2SCALE | Toward Sustainable Clusters in Agribusiness through Learning in Entrepreneurship |
| 3N | Nigériens Nourrissent les Nigériens |
| AFAP | African Fertilizer and Agribusiness Partnership |
| AFD | Agence Française de Développement (French Development Agency) |
| AfDB | African Development Bank |
| AFFM | Africa Fertilizer Financing Mechanism |
| AFSH | African Union Fertilizer and Soil Health (Summit) |
| AU | African Union |
| BMGF | Bill & Melinda Gates Foundation |
| CAADP | Comprehensive Africa Agriculture Development Programme |
| CBO | Community-Based Organization |
| CORAF | West and Central African Council for Agricultural Research and Development |
| CSO | Civil Society Organization |
| dPD | Deputy Program Director |
| DGIS | Directorate-General for International Cooperation |
| ECOWAP | ECOWAS Agricultural Policy |
| ECOWAS | Economic Community of West African States |
| EOI | Expression of Interest |
| EU | European Union |
| FAIR | Findable, Accessible, Interoperable, and Reusable |
| FARA | Forum for Agricultural Research in Africa |
| FERARI | Fertilizer Research and Responsible Implementation |
| FNS | Food and Nutrition Security |
| FSRP | Food Systems Resilience Program |
| GESI | Gender Equality and Social Inclusion |
| IATI | International Aid Transparency Initiative |
| ICRAF | World Agroforestry |
| IFDC | International Fertilizer Development Center |
| IGG | Inclusive Green Growth Department |
| IITA | International Institute for Tropical Agriculture |
| INSO | International NGO Safety Organization |
| ISFM | Integrated Soil Fertility Management |
| ISRIC | World Soil Information |
| ISSD/Sahel | Integrated Seed Sector Development in the Sahel |
| IWMI | International Water Management Institute |
| LOA | Agricultural Orientation Law |
| M&E | Monitoring and Evaluation |
| MELS | Monitoring, Evaluation, Learning, and Sharing |
| MOPSS | Mobilité Pastorale transfrontalière apaisée et Stabilité sociale au Sahel (Peaceful Pastoral Cross-Border Mobility and Social Stability in the Sahel) |
| MOU | Memorandum of Understanding |
| MSME | Micro, Small, and Medium Enterprises |
| NAIP | National Agriculture Investment Plan |
| NARS | National Agricultural Research System |
| NGO | Non-Governmental Organization |
| PAC | Partnership Advisory Committee |
| PACES | Project for the Improvement of Agricultural Productivity through Water and Soil Conservation |
| PACTE | Projet d'Agriculture Contractuelle et Transition Ecologique |
| PFJ | Planting for Food and Jobs |
| PMT | Program Management Team |
| PNGFS | National Plan for Soil Fertility Management |
| PoINSAN | Politique Nationale de Sécurité et Nutritionnelle |

| | |
|---|---|
| PPP | Public-Private Partnership |
| Pro-ARIDES | Programme Agroalimentaire pour la Résilience Intégrée et le Développement Economique du Sahel |
| PSD | Private Sector Development |
| SDDCI | Strategy for Sustainable Development and Inclusive Growth |
| SDG | Sustainable Development Goal |
| SFGP | Soil Fertility Grant Program |
| SIA | Soil Initiative Africa |
| SNRCRS | National Strategy for Soil Restoration, Conservation and Recovery |
| SNV | Stichting SNV Netherlands Development Organisation |
| SOC | Soil Organic Carbon |
| SOM | Soil Organic Matter |
| SWC | Soil and Water Conservation |
| TAAT | Technologies for African Agricultural Transformation |
| ToC | Theory of Change |
| UN | United Nations |
| USAID | U.S. Agency for International Development |
| WAFA | West African Fertilizer Association |
| WB | World Bank |
| WUR | Wageningen University & Research |

# Executive Summary

**The Promise of Soils**. In the vast and arid landscapes of the Sahel, where communities endure drought and conflict, the advancement of desertification, uncertainties of a changing climate, and the daily struggle to feed themselves, an invisible lifeline lies beneath their feet – the soil. It is the bedrock for cultivating crops, raising livestock, sustaining ecosystems, and safeguarding livelihoods. Sustainably unlocking the potential of this invaluable resource holds the promise of transforming the region's future, one in which (food) scarcity gives way to increased agricultural productivity and improved household resilience. Healthy soils store the largest amounts of fresh water, nutrients, and carbon of all biomes, with plant-microbe interactions facilitating the uptake of water and nutrients for plant growth. The linkage of this fundamental life function of soils with global themes like climate change, water and food security, and life on land and sea go unnoticed, with little priority trickling down to the sustainable management of soils.

Land clearing, climate change, and improper soil management cause soil health and fertility to decline. The impact of this deterioration becomes evident only in the long run, when soil restoration comes at a very high cost. The lack of sustainable investments to maintain soil fertility and soil health is rooted in economic and soil factors (including soil-plant-microbe interactions), unclear responsibilities among actors, and the resulting improper valuation of soil functions.

Policymakers, private sector actors, and other stakeholders responsible for creating viable conditions for sustainable soil management appear unable to develop mechanisms that result in the appropriate soil valuation. Such mechanisms are needed to contribute to climate adaptation and landscape restoration. These mechanisms are also necessary to produce more with less: doubling or even tripling food production with the same or less land, water, and other natural resources and making more efficient use of external inputs, such as mineral fertilizers. Reversing the deterioration of the yield and poverty gap will require a sustained effort to balance production systems' nutrient input and output, close nutrient cycles, and enhance soil fertility through external inputs.

**Root Causes of Lack of Investments in Soils**

- Productive agro-ecological systems call for the **integrated management** of soil, water, air, energy, and genetic resources (seeds) in changing climatic condition rather than partial interventions that result in more (output) for less (resource input).
- **Economic rationale** imposing short term financial gains may trigger **short term over-exploitation** of soils with long term negative implications whereas prevention of soil degradation and the maintenance and restoration of soil health are **long-term processes**.
- The outputs from cultivated lands – both intended food and non-food products as well as unintended ones such as greenhouse gasses and leachates polluting air and water – are used or experienced **spatially distant** from the cultivated lands.
- The integrated agro-technical management and spatial-temporal gap leads to **lack of awareness and disconnect between stakeholders** that are directly dependent and those indirectly dependent from soils, leading to **ambiguous responsibilities** with regards to sustainable soil management.

***The Netherlands Directorate-General for International Cooperation (DGIS) has risen to this challenge, with a call of unprecedented scope and funding. The goal of the DGIS Soil Fertility Grant Program (SFGP) is to address these soil fertility constraints and to achieve sustainable management of soil fertility in a way that contributes to ecologically sustainable improvements in food productivity and to increased resilience of small-scale food producers (arable and/or livestock farmers) in the Sahel.***

This proposal responds to this goal, realizing that – as seen in past interventions – singular emphasis on nutrient balancing, recycling, and enhancement has proven insufficient to maintain soil fertility and enhance systems productivity and farm income. We will expand Integrated Soil Fertility Management (ISFM) to catalyze viable business cases to drive sustainable management of soils and provide the incentives for adoption for all actors – farmers, markets actors, and policymakers – to ensure sustainable enhancement of soil fertility and health. We will develop mechanisms that lead to the correct valuation of soils by closing spatial-temporal and stakeholder gaps. We see facilitating inclusive market development and aligning incentives for IFSM adoption as the engine to drive change. We therefore call this approach ***Soil Values***.

**Mainstreaming Soil Fertility**. ***Soil Values*** will provide the foundation of food system transformation. It will be a major convenor on soil fertility and soil health in the Sahel and a catalyzer of change among soil health actors to mainstream soil fertility. We will influence the investment agendas of national and regional governments,

donors, institutional investors and – importantly – the private sector. ***Soil Values*** will not decide on what is needed, but will create a genuinely level-playing field between the actors to leverage, scale, and mainstream soil fertility among small-scale food producers, markets actors, and policymakers. Therefore, ***Soil Values*** will not intervene directly, but the program will catalyze the investments and interventions that will lead to large-scale adoption of proven technologies and approaches, be scaled to ensure social inclusiveness, stimulate debate, and build consensus and engagement of all relevant actors.

***Soil Values*** will be embedded in the focus countries and owned by local, national, and regional partners. We will facilitate stakeholder linkages and institutional collaboration at these various levels by strengthening multi-stakeholder collaboration, notably through platforms and partnerships that enable the introduction and the use of innovative methodologies and practices that support ISFM. ***Soil Values*** will support the lobbying and advocacy – based on experience and evidence – of local, regional, and national stakeholders for policy change at all levels. By leveraging local and expert knowledge, embedding learning throughout our interventions, and playing a facilitating role among farmers, markets, and policymakers, we aim to set the regional soil fertility agenda and support an enabling environment to sustain these changes, ensuring system transformation. This system transformation will, in turn, ensure the program's sustainability after ***Soil Values*** exits.

**Leverage for Impact at Scale**. ***Soil Values*** will use its intervention capacity to support ongoing and future local, national, and regional projects, programs, and policies through the introduction or reinforcement of soil fertility management and will work with national projects of the World Bank's Food Systems Resilience Program (FSRP), the DGIS-funded Pro-ARIDES program and the Economic Community for West African States (ECOWAS) Agricultural Policy for regional cohesion in soil fertility interventions. We will also work with national governments and institutions to enhance their programs.

This implies that ***Soil Values*** will reach impact at scale by managing a portfolio of partnerships, through the introduction of a flexible set of interventions. We integrate the previously separate domains of expertise in the supply of inputs (nutrients, water, and seeds) with local and expert adaptation approaches, financial and investment mechanisms, and the institutional and policy landscape.

The *Soil Values* intervention approach works through three pathways, in five intervention areas and incorporating six fundamental principles, outlined immediately below. Our comprehensive ***Soil Values*** intervention approach will support productive and resilient farming and food systems to respond to gradual and sudden stresses, including changing climate, increasing population pressure, and changing food demands.

**Pathways for Change**. ***Soil Values*** will use three pathways to as its intervention approach: (1) the agro-ecological pathway targets small-scale food producers and farming systems and the landscapes/watersheds around them; (2) the inclusive market development pathway focuses on the private sector (markets, investment, business models) in ways that overcome market barriers and strengthen the relevant markets; and (3) the enabling environment pathway addresses the capacity of public sector institutions, policies, and governance structures to support long-term soil health.

**The Intervention Areas** the ***Soil Values*** program will use to reinforce soil fertility in its partnerships are:

1. *Bundling*: bringing together both technical and socio-economic interventions into combined packages to address farm-level soil fertility management in the broadest sense necessary.
2. *Integrating* our interventions at the landscape and watershed levels to optimize water management, to introduce nature-based solutions for the greening of the landscape, and to create broad community participatory and co-designed plans.
3. *Brokering* financial instruments that aim at long-term investments in soil fertility management, along with the identification of payment mechanisms for small-scale food producers, including farmers and livestock holders.
4. *Convening* to stimulate a conducive policy environment at the regional, national, and sub-national levels.
5. *Scoping and learning* to incorporate lessons learned by the program and from other initiatives.

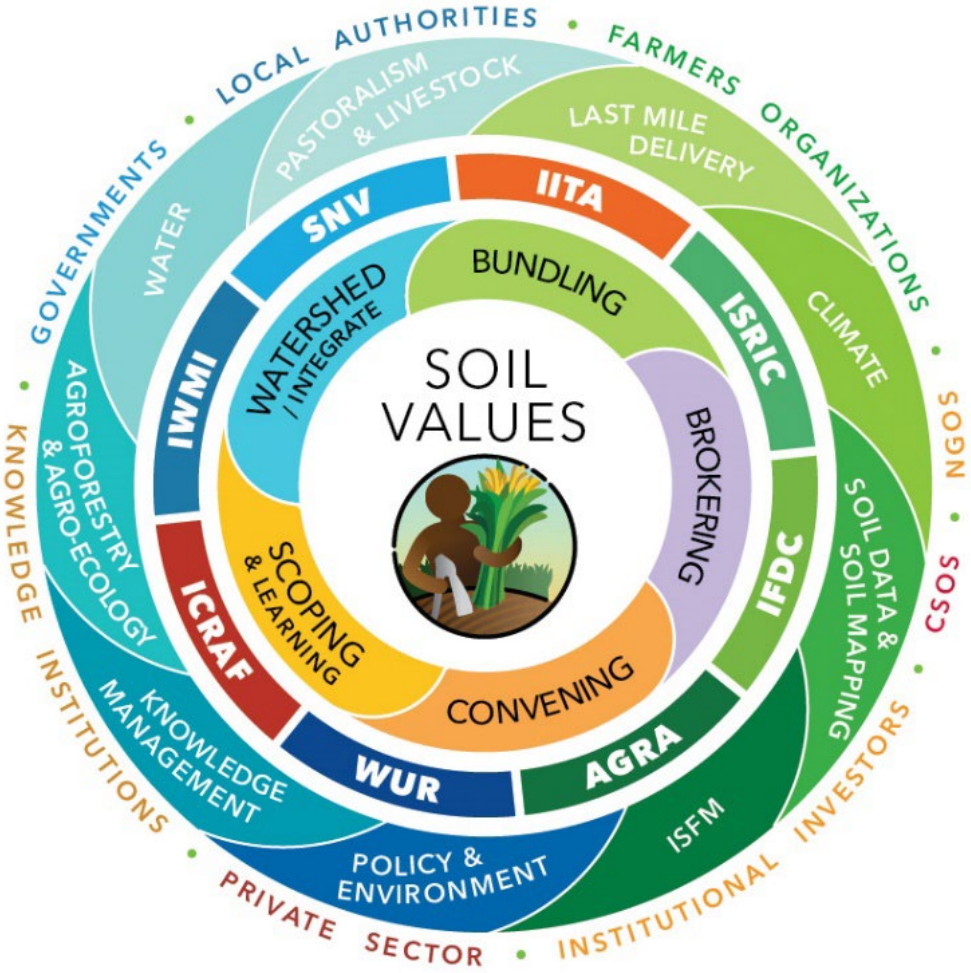



***Figure 1.*** ***The Soil Values approach is characterized by the small-scale food producer at heart, the intervention areas to break down its ambitious goal into workable solutions while building on years of experience and technical expertise. The national partners are key in the Soil Values approach as they embed the program into the four focus countries.***

**Fundamental principles of *Soil Values***

1. We work through national partners (governments, development programs and civil society organizations) to scale ***Soil Values*** intervention.
2. We always prioritize gender equality and social inclusion (GESI) in all partnerships.
3. We build national capacity.
4. We leverage large regional and multi-lateral programs.
5. We include the private sector as a major driver for soil fertility investments.
6. We manage the program with a conflict-sensitive approach, making sure to Do No Harm.

***Soil Values*** **Impact**. Over the next 10 years, ***Soil Values*** will ensure that sustainable soil fertility management will be a mainstay of Sahelian and Guinea Savanna farming systems, ***improving the soil fertility and productive capacity of 2 million hectares of farmland in the Sahel and the resilience and well-being of 1.5 million small-scale food producers, particularly women, in four implementation countries: Burkina Faso, Mali, Niger, and Northern Nigeria.*** The bordering corridor countries, Ghana and Côte d'Ivoire, will be included in dialogues about the south-north trade of fertilizers and regional food security to ensure regional coherence.

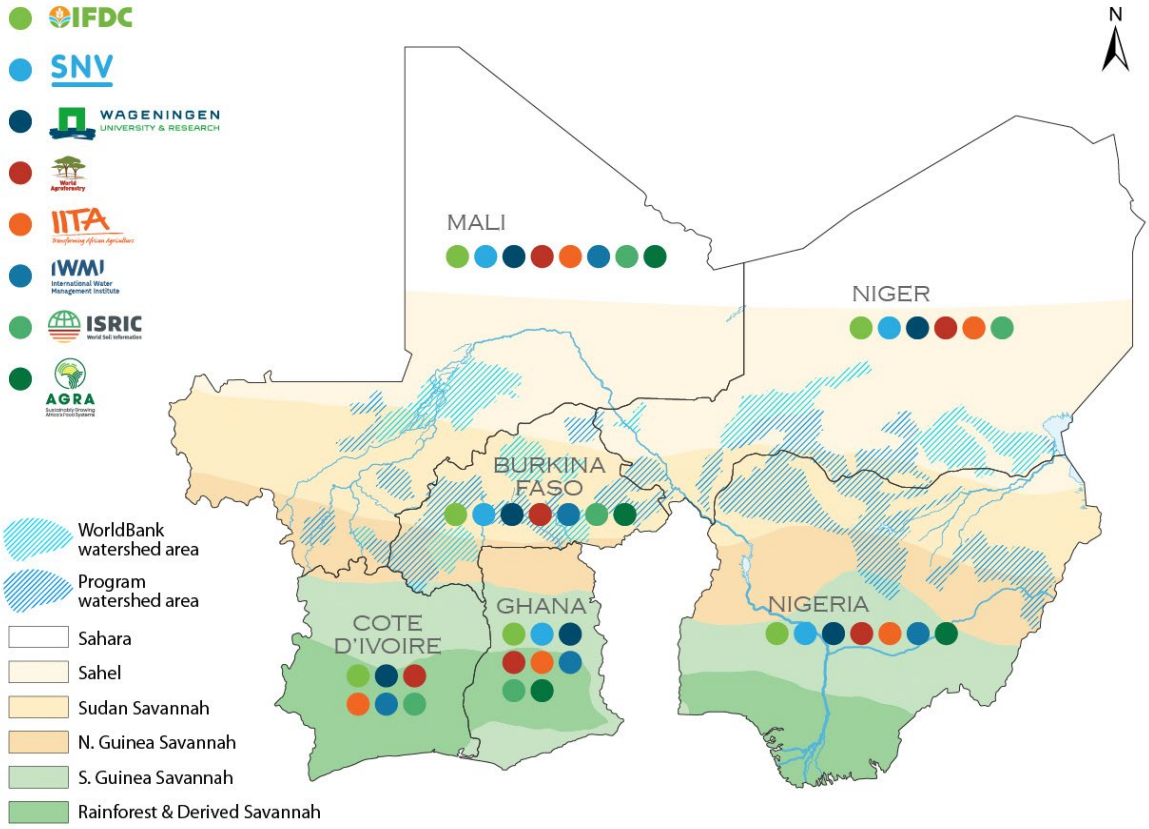



***Figure 2. Soil Values coalition presence in target countries***

**Our Consortium**. To deliver on this promise, the ***Soil Values*** Consortium has three core partners: International Fertilizer Development Center (IFDC), SNV, and Wageningen University and Research (WUR). This consortium is complemented by five convening and knowledge institutions – AGRA, World Agroforestry (ICRAF), International Institute for Tropical Agriculture (IITA), ISRIC – World Soil Information, and International Water Management Institute (IWMI), all of which are recognized leaders in their respective fields. Together, we have the required technical understanding of the multi-dimensional problem at hand; a strong presence in the region combined with the ability to implement with impact in conflict situations; a deep network, respected by and embedded in national implementing partners, regional and national policy bodies (national governments, ECOWAS, African Development Bank [AfDB], Bill & Melinda Gates Foundation [BMGF], World Bank, and others); and an understanding of the needs of both small-scale food producers, the private sector (agribusiness, fertilizer, financial sector), and government agencies. Finally, we have had the opportunity to work with DGIS over the decades, supporting DGIS to shape enabling policy environments and promote private sector-driven development and climate-smart agriculture.

**The Soil Values Consortium:**

- Unites expertise that spans the technical, social, and programmatic areas essential to achieve results in Sahelian countries: (a) ISFM, agriculture and food systems; (b) watershed management, agro-ecological methods, and application of nature-based solutions; (c) engagement with small-scale food products and producers especially women, (d) designing and delivering gender-transformative and inclusive programs and interventions in smallholder agriculture to achieve agronomic, social, and economic goals; (e) capacity strengthening, scaling, and influencing; and (f) national and international research and policy expertise on topics such as land use, climate, gender transformation, and water management.
- Has an on-the ground presence that enables successful implementation in the complex West African environment: The Soil Values consortium has a strong track record of working in complex and fragile environment and has established operations in Burkina Faso, Mali, Nigeria, and Niger, as well as Ghana and Côte d'Ivoire. We can hit the ground running.
- Possesses a proven network of partners to deliver and scale ISFM and related products and services. By creating a shared platform for coordination and working through existing projects and partners rather than directly implementing project activities ourselves, we will ground the project in local knowledge, streamline implementation, embed scaling, and enhance long-term sustainability.
- Regularly convenes key stakeholders, whether in the public and/or private sector, to improve the policy environment, private sector-driven development, institutional financing arrangements, and climate-smart agricultural practices.
- Serves as trusted partners of DGIS: IFDC experience with 2SCALE, DGIS-funded soil programs, including with work with SNV and WUR, and CGIAR institutions bring together the technical capacity, geographic knowledge, local relationships, and have the systems/processes to facilitate a Soil Values project that drives impact.

**National and Regional Integration**. ***Soil Values*** will not be a stand-alone program, but will work through existing projects, programs, policies, and organizations, such as World Bank FSRP, DGIS Pro-ARIDES, the ECOWAS Agricultural Policy (ECOWAP), and national programs. The ***Soil Values*** consortium has formalized its longstanding collocation with ECOWAS, World Bank, West and Central African Council for Agricultural Research and Development (CORAF), West African Fertilizer Association (WAFA), and African Fertilizer and Agribusiness Partnership (AFAP), while taking advantage of ongoing projects, such as DGIS Pro-ARIDES and the Netherlands Embassy-funded Integrated Seed Sector Development in the Sahel (ISSD/Sahel) in Mali, Burkina Faso, and Niger and the U.S. Agency for International Development (USAID) West African Regional Mission (WA)-funded Enhancing Growth through Regional Agricultural Input Systems (EnGRAIS) Project for West Africa, which supports ECOWAS in operationalizing its soil fertility and fertilizer strategy and integrating soil fertility into national and regional policies and programs.

The anticipated outcome of the African Union Fertilizer and Soil Health (AFSH) Summit (November 2023) will be the African Union Fertilizer and Soil Health Action Plan, and ***Soil Values*** will assist in turning this action plan into regional and national policies, individual country roadmaps, and the second Comprehensive Africa Agriculture Development Plan (CAADP2) agenda and will support the implementation efforts through the five intervention areas. The Memorandums of Understanding (MOUs) IFDC has signed with the Ministries of Agriculture in the target countries will lay the basis for the implementation, working with the National Agricultural Research System (NARS) in each country.

**Quadrupling the DGIS Budget**. ***Soil Values*** intends to leverage additional funding to increase the impact of the DGIS SFGP investment. We will target €100+ million buy-ins from development partners (bilateral, multilateral, and foundations) in soil fertility funding for the Sahel, €100+ million from the private sector (fertilizer and agri-food industry) for soil fertility business models in the Sahel, and €100+ million in fertilizer sector financing for soil fertility improvement in the Sahel.

# 1. Introduction

The Sahelian region faces challenges in safeguarding the availability of sufficient food supply for its rapidly growing population due to a combination of biophysical conditions, instability, and climate change. Soil depletion – set against a backdrop of competition between agriculture and livestock, political unrest, and geo-political resource conflict – is further exacerbated by climate change, which in turn fuels food insecurity, unemployment, especially among women and young people, migration, gold panning, and social unrest. Some

experts predict that if this complex situation is not addressed, the Sahel may become a collection of failed states in the next decade.[1]

Soil fertility's importance as a major limiting factor for agricultural and rangeland productivity was established decades ago with the Green Revolution. Soil-related initiatives often focused on increased crop yields, which led to short-term results, but did not translate into sustained improvements in soil fertility. Decades passed before soil fertility received Africa-wide attention. In the early 2000s, renewed interest in soils spurred movement toward a more nuanced and holistic understanding of soil fertility, water management, and their linkages with agricultural development, reflected in the 2006 Africa Fertilizer Summit in Abuja, Nigeria, organized by the African Union (AU) with IFDC's and AGRA's technical support.

In the years that followed, climate change, the 2008 financial crisis, pandemics including COVID-19, and inflation negatively affected agricultural productivity, although offset by rise in private sector fertilizer blending and manufacturing across Africa and the emergence of a more nuanced understanding of soil fertility and health. If West Africa is to make advances on the Sustainable Development Goals (SDGs), especially SDG2 (zero hunger) and SDG13 (climate action), then far-reaching changes will be required that support sustained agro-ecological intensification. During the May 2023 Lomé High-Level Roundtable on Fertilizers, West African Leaders recognized the urgency of caring for soil health and fertility. Through the Lomé declaration, they also adopted a clear roadmap for improving soil health and fertility in the region over a 10-year period, from 2023 to 2033. The upcoming African Union Fertilizer and Soil Health Summit to be held later this year will continue to develop the policy. Together, these high-level strategies presents the opportunity – and challenge – of implementation.

The Dutch Government has repeatedly demonstrated its commitment to putting sustainable soil management back on the broader development agenda. The current Dutch foreign trade and development cooperation policy strives to make food systems more sustainable and more resilient, in accordance with the SDGs, in particular SDG2.[2] In 2023, the Netherlands Directorate-General for International Cooperation (DGIS) released a policy framework that explicitly links improved soil fertility with a layered approach that considers farmers in farming systems, watersheds, and the enabling environment, along with agro-ecological and socio-economic aspects. The policy identifies the need for structural transformation in the agriculture sector in Africa.

The DGIS designed the SFGP to translate these policy aims into action in West Africa, making food systems more sustainable and more resilient while ensuring the preservation of ecosystems, increasing resilience to climate change and improving land and soil quality.[3]

Given the Dutch Government's past investments in soil-adjacent seed and water management and food value chain sectors, DGIS seeks to scale impact and catalyze action by other governments and donors. The World Bank is a natural ally, given its renewed focus and investment in West Africa soil fertility and watersheds, as are CGIAR and its affiliates, including ICRAF, IITA, and IWMI (our knowledge partners). Projects such as the BMGF-funded CGIAR Excellence in Agronomy and the USAID Space to Place initiative are also important points for coordination and dissemination.

***Soil Values*** **Response**

***Soil Values*** will work through three pathways – **agro-ecological pathway**, **inclusive market development pathway** (markets and finance), and an **enabling environment pathway** (institutions and policies). Each of these pathways represents a different domain of action. The agro-ecological pathway targets small-scale food producers and farming systems and the landscapes/watersheds around them. The inclusive market development pathway focuses on the private sector (markets, investment, business models) in ways that overcome market barriers and strengthen the relevant markets and on financing institutions to invest in soil fertility. Finally, the enabling environment pathway addresses the capacity of public sector institutions, policies, and governance

[1] Declan Walsh, 2023. Coast to Coast, a Corridor of Coups Brings Turmoil to Africa.

[2] This is outlined in a letter to parliament on global food security ('Towards a World Without Hunger in 2030: the Dutch contribution', Parliamentary Paper 33625-280).

[3] Recent research, including studies by IFDC, proposes that the development of a resilient food system can only be achieved when agro-technological practices are combined with inclusive food value chains and institutional readiness. Bindraban, 2020. Soil and Water Interventions and Strategic Programming for Food Security in the Western Sahel: The Case for Burkina Faso.

structures to support long-term soil health. The activities in the program will be aligned for mutual enforcement of these three pathways.

***Soil Values*** will mainstream soil fertility by implementing activities in five domains or intervention areas, each of which links to one or more of the pathways mentioned above:

1. **Bundling** will bring together technical and socio-economic interventions into combined packages to address soil fertility management.
2. **Integrating** the bundling interventions with activities targeting community or communities at the landscape and watershed levels, with the aim of optimizing water management and introducing nature-based solutions for greener landscapes. The integration is achieved through open participatory processes with small food producers and communities that lead to co-designed plans.
3. **Brokering** financial instruments that aim at long-term investments in soil fertility management, along with identification of payment mechanisms to small-scale food producers, including farmers and livestock holders. along with identification of payment mechanisms to small-scale food producers, including farmers and livestock holders.
4. **Convening** public and private sector actors to address market gaps or opportunities and stimulate a conducive policy environment at the regional, national, and sub-national levels.
5. **Scoping and learning** to incorporate lessons learned by the program and from other initiatives.

***Soil Values*** will not be a stand-alone program. As we act across these domains, ***Soil Values*** will integrate six **fundamental principles** into our efforts:

1. We **work through national partners (governments, development programs, and civil society organizations [CSOs])** to scale ***Soil Values*** interventions by channeling funding and expertise. (See adjacent text box for an illustrative list of potential partners.)
2. We consistently apply a **gender equality and social inclusion** (GESI) focus.
3. We will **build national capacity** of professionals and institutions to mainstream the ***Soil Values*** approach in current and future programs, ensuring systems transformation and a supportive enabling environment.
4. We **leverage large regional and multi-lateral programs**, such as the World Bank-funded FSRP and AfDB-funded Technologies for African Agricultural Transformation (TAAT) with the Africa Fertilizer Financing Mechanism (AFFM) as the financial mechanism, AFSH Action Plan, ECOWAS Fertilizers and Soil-Health Roadmap, and AU CAADP2 (Malabo Declaration) to maximize synergistic complementarities.
5. We will work with and through the **private sector** to design and scale business models to drive ISFM adoption, including agro-ecological and regenerative farming practices.
6. We will manage the program with a **conflict-sensitive approach**, making sure to Do No Harm.

In 10 years, ***Soil Values*** will have co-designed and supported national organizations to deliver a proven set of bundled ISFM and integrated watershed/landscape management practices, tools, finance opportunities, and marketing services to 1.5 million farmers, more than half of whom are women. ***Soil Values*** will collaborate with government agencies, small-scale food producers (especially women and youth), pastoralists, and CSOs to implement

**Our National Partner Network**

The Soil Values consortium works with many actors in the target countries and has identified partial list of potential national partners and collaborators in our country profiles in the Annexes.

An illustrative list of partners includes:

**Burkina Faso** - SECURAGRI (sustainable land management), Eau, CLE du Développement Durable (ECDD) (SWC), INERA (seeds/training),Coordination des ONG et associations des femmes du Burkina (COAFEB)

**Mali** - Farmer organizations (Association des Organsations Paysannes Professionnelles), National Agricultural Research Committee (CNRA) (research), Toguna (input access), Convergence des femmes rurales pour la souveraineté alimentaire (COFERSA)

**Niger** - Regional Soil Fertility Mapping Program (PRCFS) implemented by ICRAF and funded by the European Union (EU), Regional Project to Support Pastoralism in the Sahel Phase II (PRASP 2) L'ONG Femmes, Actions et Développement (FAD)

**Northern Nigeria** - CropIT Digital Advisory Agric Platform, Nasarawa State University, Lafia, Nigeria Institute of Soil Science (NISS), Transforming Irrigation Management in Nigeria (TRIMING) PMU Association of Northern Women Entrepreneurs (ANWE)

**Regional Partners**

**World Bank** Food Systems Resilience Program (FSRP), **ECOWAS**, **CORAF**, **AfDB**, regional private sector partners through AFAP, and WAFA.

soil and water (SWC) conservation practices in 40+ river basins/watersheds, covering 2 million hectares.[4] Equally important, ***Soil Values*** will work with and through national organizations to achieve these outcomes.

**Our Commitment to Co-Design, Planning, and National Partner Engagement**

As the lead, IFDC has engaged with national implementing partners from the beginning to co-design the project. The proposal was enriched with their feedback, shared insights, objectives, and opportunities for collaboration identified through our consultations, workshops, and stakeholder meetings.

- **National consultative co-design workshops**: In June 2023, IFDC organized four workshops, one in each of the implementation countries, attended by more than 79 participants from 64 organizations, including civil society organizations, universities, research and development (R&D) institutions, private sector actors, and policymakers (see Annex). These interactive workshops worked toward a common vision of the future, showing the impact of 10 years of implementation of the Soil Fertility Grant Program.
- **Co-creation and co-ownership with *Soil Values* consortium partners**: Based on the outcomes of the in-country workshops, the Soil Values consortium, and knowledge and convening partners, participated in a design workshop held in Accra, Ghana, in June 2023. We brainstormed on the various elements needed for the full proposal. By encouraging active involvement of consortium partners in the proposal development process, we benefited from rigorous discussion of ideas and fostered a sense of shared vision, ownership, and commitment.
- **Regular review and feedback**: IFDC believes in the importance of regular and robust debate to improve the design and implementation of Soil Values. IFDC hosted internal discussions to address the feedback from DGIS (letter, 25 May 2023). After the Accra workshop, consortium partners were given a Microsoft Teams account to share proposal-specific background. Monitoring, Evaluation, and Learning (MEL) leads from each organization met regularly to delve into the theory of change and discuss the monitoring and evaluation framework. IFDC met regularly with each partner to define roles and the budget. Core partners read and provided substantively on the proposal and workplans.

## 2. Organizational Capacity

To support DGIS in this pivotal initiative, IFDC has assembled a coalition of organizations with a long history of collaboration on a wide range of initiatives to improve soil fertility in West Africa. The members each bring decades of experience of inclusive processes with local, national, and regional actors to *learn, co-design, and adapt* local agroecological practices to include external inputs for sustainable implementation of evidence-based ISFM.

***Soil Values*** will be implemented by a consortium of three core implementing partners: **IFDC** (lead), **WUR**, and **SNV**. **IFDC** has almost 50 years of experience in designing and implementing research and development projects focused on improving sustainable agricultural productivity. Moreover, IFDC has been the official ECOWAS technical arm on soil fertility management and fertilizers for over 25 years. **SNV** is a mission-driven global development partner, rooted in the contexts and societies where we work through effective program delivery and influencing, with a central focus on transforming agri-food, energy, and water systems to enable sustainable and more equitable lives for all. **WUR** is one of the leading agricultural universities worldwide and focuses on education and research in three related core areas: food, feed, and bio-based production; natural resources and living environment; and society and well-being. This will allow WUR to create added social-economical as well as agroecological value through the transfer of knowledge and technologies.

The core consortium will work hand in hand with knowledge partners, which are the thought leaders in their respective fields:

- **AGRA** is a farmer-centered, African-led, and partnerships-driven institution that is transforming Africa's smallholder farming through high level dialogues for policy support, commitments by institutional investors, and on-the-ground activities such last-mile-delivery of services to farmers. They are the convening partner in ***Soil Values***.
- **ICRAF** develops knowledge practices, from farmers' fields to the global sphere, to ensure food security and environmental sustainability based on its agroforestry science and abilities to monitor progress at landscape level.

[4] Sustainable water management includes increases in trees and shrubs and grasses for fodder, adequate fuelwood, fruits and non-forest products, small-scale farmer-led irrigation, livestock corridors, and operational pastoral waterpoints.

- **IITA** has generated numerous agricultural innovations to sustainably enhance farm productivity and, as leader of the Excellence in Agronomy initiative, has developed various delivery mechanisms to reach out to large numbers of farmers.
- **ISRIC** is the custodian of global soil information and will support capacity development on soil data and mapping in support of sustainable management of soil and land.
- **IWMI** targets optimal management and governance of water and land resources at watershed and landscape levels through stakeholder and participatory approaches, farmer-led irrigation development, and climate-smart agricultural water management solutions.

**Scaling through Partnerships: The 2SCALE Model**

2SCALE has worked in 13 countries in Africa over the last decade, creating sustainable and inclusive business models while supporting local food production, processing, innovation, climate adaptation and food security through more than 125 public-private partnerships (PPPs), 1.5 million farmers, and over 10,000 micro, small, and medium enterprises (MSMEs).

As ownership of ***Soil Values*** interventions will lie with local and national partners, we will collaborate to add value to their ongoing in-country initiatives. The experience, connections, and networks in West Africa that the team has built over the years through projects such as Toward Sustainable Clusters in Agribusiness through Learning in Entrepreneurship (2SCALE) will support ***Soil Values*** in understanding the local context and dynamics on the ground. We have strong relationships with regional and national policy organizations, (sub-)national governments, universities and NARS, aggregators, food processors, extension services, private industry, and farmer associations. ***Soil Values*** is uniquely positioned to build on these partnerships and link our interventions to our ongoing and upcoming regional and national projects. (For more on the essential role of our national and regional partners, see Section 6 – Collaboration with Local Partners.)

***Soil Values*** organizations have a track record of working together to achieve impact. Currently, IFDC and AGRA are supporting the AU in setting the agenda for the upcoming AFSH Summit. IITA, WUR, and other African and international entities contributed to the science-based evidence for the AU to guide decision-making and soil health policies and actions. Emphasis on soil health comes from the joint understanding that quality seeds and other inputs can only perform best in fertile soils, which demonstrates that IFDC, IITA, and AGRA complement each other perfectly. In addition, IFDC and WUR work together on HortiNigeria. WUR provides strategic and technical support to areas such as the development of business models and the promotion of new varieties and advanced cultivation practices. WUR and SNV also have a long track record of working successfully together on Netherlands-funded horticulture programs in six countries across Africa. Another successful example of a joint initiative is 2SCALE, where SNV and IFDC work hand in hand. IITA, IWMI, and IFDC have joined forces in the AfDB-funded TAAT program to improve agriculture as a business. IITA, IWMI, and ICRAF all participate in Excellence in Agronomy to ensure agro-ecological technologies and approaches to promote agricultural development are available to national partners. Finally, IFDC, IITA, and ISRIC have extensive institutional collaboration on soil and soil data.

All coalition partners have extensive knowledge and experience in the Sahel region. The extensive knowledge of the region also comes with a focus on specific target groups, such as pastoralists, youth, and women. For example, SNV is implementing flagship projects such as the Peaceful Cross-Border Pastoral Mobility and Social Stability in the Sahel (MOPSS) Phase 2 project (2023-2025), which aims to promote peaceful coexistence between primarily livestock farmers and sedentary farmers in the border areas of Western Sahel (Benin, Burkina Faso, Côte d'Ivoire, Ghana, Mali, Niger, Togo). Due to the longstanding experience in the region, the coalition partners have built their working approaches in conflict areas. Security protocols for staff, assets, and field operations are in place. Staff and partner security training materials are readily available, and security coordinators continuously monitor the security situation in all implementation countries through trained national staff, partner organizations, embassies, United Nations (UN), and the International NGO Safety Organization (INSO).

Moreover, the networks will enable the ***Soil Values*** consortium and its local and national partners to influence the broader regional soils agenda. The support for this coalition, expressed by ECOWAS, CORAF, AfDB, AFAP, WAFA, World Bank, and OCP, illustrates the high level of integration and the readiness of partners to leverage our impact at scale. (See Institutional and Policy Landscape for more information on synergy). The coalition also capitalizes on 40 years of (often Dutch) investment in the region and continuous adaptation and advancement of our methods and approaches based on progress and lessons learned.



**IFDC From Thousands to Millions** (1000+; DGIS, 2006-2011) in Burkina Faso, Benin, Ghana, Mali, Niger, Nigeria, Togo

- 120,000-140,000 people benefited from capacity strengthening (36% women).
- Yields increased by 30-60% for participating farmers.
- Participating farmers increased revenues of targeted crops by 20-200% (over four years).
- ±230,000 hectares of land was brought under more sustainable agricultural practices.



**IFDC/SNV 2SCALE** Phase 1 (DGIS; 2012-2018) and Phase 2 (DGIS; 2019-2024) in Burkina Faso, Côte d'Ivoire, Ethiopia, Ghana, Kenya, Mali, Niger, and Nigeria

- Over €300 million was leveraged from the private sector and financial institutions.
- 1 million base-of-the-pyramid (BoP) consumers were empowered by providing access to nutritious food.
- 125 public-private partnerships (PPPs) were formed involving 1.5 million farmers and over 10,000 micro, small, and medium enterprises (MSMEs).



**SNV Pro-ARIDES** (DGIS, 2021-2030) In the first 15 months of the program:

- 114 agro-pastoral learning fields were established.
- 11,400 households were trained on composting production and use.
- Capacity of 266 farmer organizations, 40 women's organizations, 29 youth organizations, and 168 village savings and loan associations was enhanced.

***Figure 3. Results from selected projects implemented by consortium partners***

# 3. Context and Problem Analysis

## 3.1. Overview

Like most countries in Africa, Burkina Faso, Mali, Niger, and (Northern) Nigeria face a soil fertility crisis caused by increasing exploitation of the soils without adequate replenishment of nutrients removed by food, fodder crops, pastures and affected by deforestation and desertification, among myriad other factors. To date, food production increases have primarily come from land conversion of natural ecosystems, especially pastoral ecosystems to agricultural use, rather than from yield increases. This lack of agricultural intensification due to degrading soils is exacerbated by population pressure, changing climate, and poor governance, further fueling conflicts over access to scarce resources, especially between pastoralists and sedentary agriculturalists. Together with the consequences of unequal access to resources for youth and women, a complex mix of inter-related issues must be addressed by ***Soil Values***.

## 3.2. Soil Fertility Factors

Soil fertility declines when the soil nutrient stock declines. When more nutrients are removed from the soil (through crop production, erosion, and breakdown of organic matter and subsequent leaching or evaporation of nutrients) than there are added, soil nutrient stocks decline, as does soil fertility.

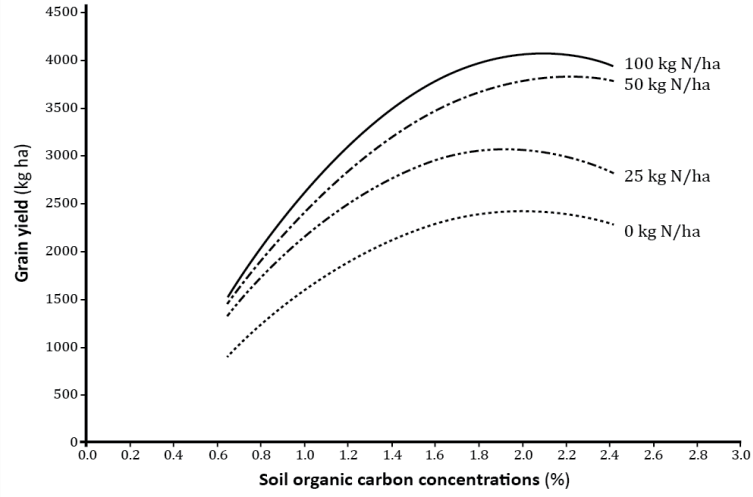
**What are Fertile Soils?**

Fertile soils:

- Adequately support plant growth, be it pasture, annual or perennial crops, or trees.
- Retain nutrients and water longer and release them in the right amounts for these plants to grow.
- Contain a stock of soil organic matter (SOM). SOM in soils is positively associated with nitrogen availability, a primary nutrient requirement for plants.
- Have nutrients, added naturally through mineralization of rocks and soil, deposition from the air, SOM breakdown, and biological nitrogen fixation, or agronomically through the addition of organic amendments or mineral fertilizer.

Soil organic matter (SOM), the most important indicator of overall soil health, benefits soil structure and water and nutrient retention and cycling and supports soil flora and fauna. The presence of SOM is necessary but not sufficient to sustain high agricultural productivity. Current SOM levels in the region's agricultural soils do not provide sufficient nutrients to support high crop growth. If anything, crop growth is further suppressed due to constant nutrient extraction from harvests coupled with inadequate addition of nutrients to soils, whether from organic sources or mineral fertilizers. Soil fertility in old soils like those in Africa depends on soil organic matter to provide nutrients through mineralization and for binding nutrients so they are not leached to the subsurface. SOM declines rapidly as a result of erosion or increased decomposition due to land clearing. SOM can gradually increase with the addition of manure, compost and plant residues.

SOM presence in soils is closely associated with nitrogen (N) availability, a primary nutrient for plants. Extractable phosphorus (P) is the second most important nutrient. The third most important characteristic of soils is its acidity, referred to as the pH. A sub-optimal pH reduces nutrient availability. In the Sahelian soils especially, the absence of N and P limits yields. Under current average soil conditions, Sahelian ecosystems produce around 3 metric tons (mt) of plant biomass per hectare (ha), or 1-1.5 mt of grains/ha.




Redrawn from Musinguzi et al., 2016

***Figure 4. Response of maize grain yield to added nitrogen fertilizer under soils of different soil organic carbon content (with sufficient P and K applied to not be limiting).***

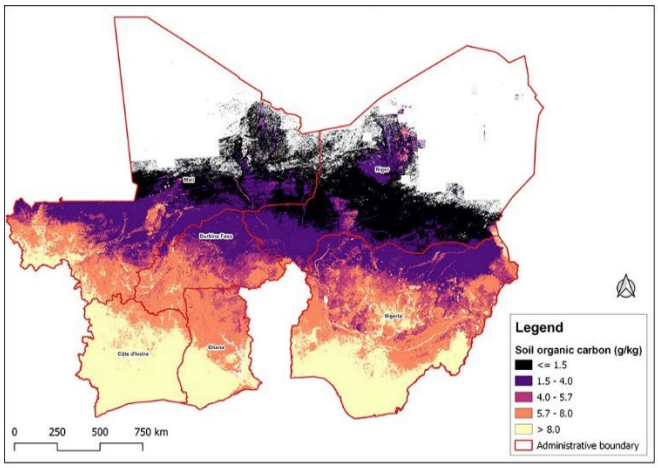
The implications of SOM on crop growth is significant. Higher SOM not only supports higher yields, but higher SOM also makes the use of fertilizers more effective. The figure to the left also shows that grain yield with different amounts of fertilization (N/ha) is higher at higher SOM levels. Higher SOM levels, in turn, increase the effectiveness of (mineral) fertilizers. When soil fertility (N and P) is not a limiting factor, biomass yield could average 7 mt/ha of grain for maize and rice (and around 5 mt for sorghum and millet). This implies that rainwater is effectively managed through SWC measures, meaning it does not run off the field and is available for the crop to grow. If water were not a limiting factor (e.g., through supplementary irrigation for rice) and pests, weeds, and diseases were controlled, then yields would increase to 8-9 mt/ha of grain. In summary, yield increases can be attained with carefully targeted soil amendments and water management.

Soil maps (below) illustrate the distribution of the three most determinant soil fertility parameters: soil organic carbon (SOC, which equals half the amount of SOM, along with total N, which approximates 10% of SOC), extractable P, and pH. These maps are the first field-level soil maps for Africa with 20+ soil properties predicted at 30 m resolution, allowing for more specific targeting of SOM and soil amendment solutions.[5] While SOM in

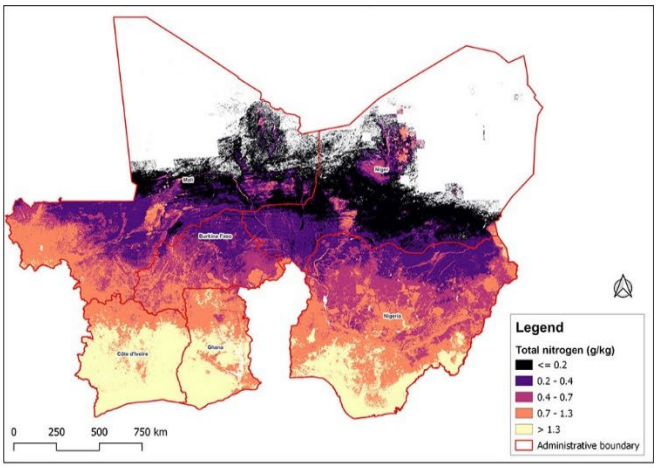
[5] ISDA (downloaded July 2023).

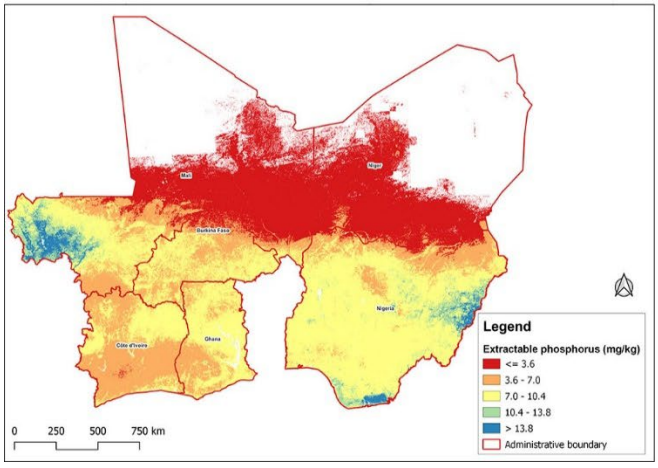
coastal West Africa exceeds 1.6%, much of the remaining area contains 0.8-1.6% SOM, except the Guinea Savanna north, where SOM is less than 0.8%, dropping below 0.2-0.3% in the Sahel (Maps 1 and 2). Map 3 also highlights the need to address P gaps. Soils that are highly deficient in P (containing less than 10 mg/kg of extractable P) or have critical deficiency (10-30 mg/kg) may benefit from fertilizers (provided other nutrients are available). Even soils with adequate P levels (above 30 mg/kg) need supplementary P to compensate for its extraction by the crop yield. Soil acidity (Map 3) reduces nutrient availability to crops, commonly at pH values below 5. Liming can increase pH (in the range of 4.0-5.5) in the immediate term, which increases the availability of nutrients and, importantly, helps to mitigate aluminum toxicity. Increasing yields on soils with low SOM requires more precise nutrient combinations beyond the standard treatment of N, P, and potassium (K) (the third most important nutrient for plants). There is growing evidence for instance that sulfur (S) is co-limiting growth as well.

***Map 1 indicates variation in SOC, a proxy for SOM.***

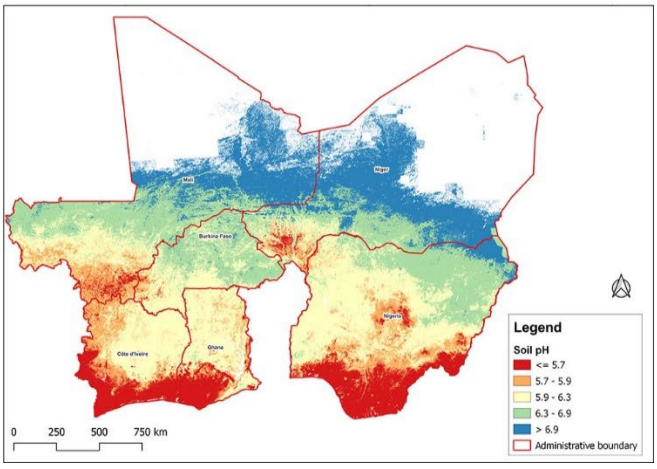



***Map 2 Indicates variation in total soil nitrogen.***




***Map 3 indicates that program target zones experience significant deficiencies of extractable phosphorus.***




***Map 4 indicates high levels of soil acidity in the Northern and Southern Guinea Savanna Zone.***

Crop yields need to keep pace with population growth if improved soil fertility is to translate into greater household resilience. The total population of Burkina Faso, Mali, Niger, and Nigeria more than doubled to 275 million between 1990 and 2020 and will increase by almost 40% to 380 million by 2033. For food production to keep pace with a growing population's dietary needs, the annual increase in crop yields must exceed 4% per year. This increase assumes that current dietary levels remain unchanged and that no expansion of agricultural land is needed. Over the past decades yields of the four major cereals have increased by only 10-30 kg/ha annually. To reach the 4% increase, yields must go up by 40-50 kg/ha annually during the coming decade.

In the short term, farmers achieve increases in total food production by expanding cultivation on marginal and protected lands. This expansion comes at the expense of natural and pastoral ecosystems, greenhouse gas emissions, and biodiversity loss. Even if all the current organic material available (manure, green manure, compost) were used, the corresponding increase in productivity would still be far short of anticipated needs. Raising productivity will require increasing use of organic matter, complemented with the judicious use of mineral fertilizers, intensive use of soil and water conservation practices, and agroforestry.

The newly available accurate and high-resolution soil and landscape maps referenced above improve the availability and accuracy of African soil information and will enable site-specific recommendations (as part of bundles of technologies and support services). We know from a large body of scientific knowledge that SOM, P, and N are at critical low levels in general. However, for site-specific interventions, the spatial patterns of these critical parameters need to be available. Technologies such decision support tools link digitally available soil maps with local site-specific information. The USAID-funded Space to Place initiative, implemented by IFDC, will use these new applications to provide area-specific guidance (see text box below). To achieve the next level of accuracy requires the participation of local soil information institutes as they often have the data and soil knowledge to produce these products. In addition, verification of the impact of actual crop responses to fertilizer strategies based on soil data will be needed to arrive at realistic recommendations.

**Space to Place (S2P) initiative (2023-2025)**

**Ghana Niger, Malawi, Tanzania, Zambia**

**Funded by USAID and Implemented together with CGIAR and other international research centers: CIMMYT, World Vegetable Center, and the International Livestock Research Institute**

The S2P initiative aims to provide improved fertilizer and agronomic recommendations and support better access to fertilizers for approximately 17 million people in key production systems – **maize mixed, agro-pastoral, cereal-root crop mixed, and highland mixed**. Anchor activities will be conducted in **Ghana, Niger, Malawi, Tanzania, and Zambia**. The primary goal is to reduce fertilizer wastage at the farm level by 60% over two years.

The S2P project, guided by geo-referenced soil maps, crop response functions, decision support tools (Space) and combined with the location- and management-specific farm(er)-level characteristics (Place), aims to achieve site-specific hyper-localized balanced fertilizer recommendations that increase fertilizer use efficiency and result in productive, profitable, and resilient smallholder agricultural systems. The approach is being developed in Tanzania, Zambia, and Malawi, and in Madagascar. The approach is relevant for both regional (Space)-level stakeholders (such as policymakers, planners, and fertilizer companies) AND farm (Place)-level stakeholders (farmers, extensionists, service providers). The science-based support for soil fertility and crop nutrition management provided by the S2P project platform is one of the reasons that has prompted OCP to support the S2P approach.

## 3.3. Watersheds and Landscapes

Agricultural development generally emphasizes farm-level interventions. ***Soil Values*** will address soil fertility in the context of landscape-based approaches, as this will allow us to address the issues of deforestation, crop livestock interactions, and water management. It will place the crop- and farm-level activities in this broader spatial and societal context. Landscape approaches allow for communities and their practices and concerns to be included in the design of landscape plans in order to balance the different needs and demands of various groups. Large-scale intensification efforts call for interventions at watershed and landscape levels and for social constructs at community levels. To achieve this, it requires:

**Watersheds and Landscapes**

In this proposal, watershed and landscape are used interchangeably. The notion is the need to aggregate beyond farm level. In some cases, the watershed is more applicable as a concept, as there are clear central waterways and responsible water authorities in hydrological and administrative boundaries. In other cases, these features are not present. Here soil and water conservation is more locally relevant.

- **Water**: It is feasible to achieve sustained yield improvements through intensive agricultural practices that increase both the level and duration of water stored within the soil and replenish soil nutrients. For this, interventions will also be needed beyond farm level to include integrated water and land

management technologies and practices such as zaï/tassa (soil pits), demi-lunes (half-moons), grass/tree corridors, contour bunds (soil bunded ridges), and micro-catchments, i.e., small structures that are most appropriate in the Sahel context to collect water and soil runoff. Supplementary water supply through farmer-led irrigation, including boreholes and solar irrigation, has been used judiciously to prevent salinization and other soil problems. However, the sustained adoption of such techniques remains relatively low. In Sahel/West Africa, it is estimated that fewer than 20% of small-scale farmers use micro-catchments on any part of their land.[6] On the other hand, the experiences with "re-greening" and fertilizer subsidies indicate that the appropriate policies (e.g., through farmer/community participatory approaches, targeted subsidies) can enhance technology adoption.

- **Crop-livestock interactions**: Pastoral mobility is an important element in pastoralist-agriculturalist relationships that contributes to soil fertility issues for both farmers and agro-pastoralists. When farmers allow migrating herds to feed from their crop residues or spend the night in their fields, the animals leave behind manure. The manure contains nutrients that are more readily available for plants, but this practice does not add to the total amount of nutrients in the field. On the other hand, land degradation occurs because of rising pressure on and competition over resources, encroachment of agriculture into pastural lands, fragmented mobility patterns, and different ways of keeping livestock.[7] Besides the effects of a higher density of transhumance herds, the Northern Guinea Savanna showcases the double effect of mixed, crop-based systems of farmers (agro-breeders), who both expand the arable land and invest in cattle herds with an agricultural rationale.
- **Land governance practices**: In all Sahel Northern Guinea Savanna zones, rising land pressure and higher land values lead to competing claims and to conflicts. Over the past 15 years, the governments of Burkina Faso, Mali, and Niger have paid greater attention to the importance of livestock mobility for ecosystems in the Sahel and Northern Guinea Savanna. The countries have legislation recognizing different land tenure rights, common pool resources, and livestock mobility. National governance and decentralized local governance have been ambiguous, with (country-specific) outcomes that vary but tend to favor farmers over pastoralists.[8] Customary tenure regimes are undermined, with the risk of reducing a wide range of access and property rights to mere private ownership and titles. The commons are exposed to land acquisitions and land speculation is allowed. Secondary rights holders, such as women and pastoralists, risk losing land. Most responses focus on agriculture and livestock association or intensification (technologies) and on conflict resolution, but relatively few successfully focus on (socio-political) access and tenure conditions.[9]

The integrated landscape governance of agriculture and livestock is part of the prerogatives and competences of local governments and land management institutions. Their experiences should serve as a basis of inspiration for a sustainable agrarian dynamic. In ***Soil Values***, soil fertility is also understood as a common heritage, aiming not only at an increase in agricultural production but also at environmental and social sustainability, integrating agricultural, pastoral, forestry, and hydraulic functions. Such an approach would mitigate the risks that farms take when investing in fertilizers and better consider the land dynamics (land rental, fallowing, mobility of water points, livestock parking areas) that structurally affect the local adoption of external services/inputs.

## 3.4. Climate Change

The changing climate has already affected livelihoods throughout the Sahel. Signs of climate change in the Sahel include:[10]

- Temperatures will increase by 3°C in the coastal zone and 4°C in Continental Sahel by 2100. Temperature increases will reduce crop production because of heat stress.
- Maximum warming will affect the summer months the most.

[6] cf. Wennink, KIT/WUR, 2021

[7] Turner, M., and E. Schlecht, 2019. "Livestock Mobility in Sub-Saharan Africa: A Critical Review." *Pastoralism: Research, Policy and Practice* 9: 13. https://doi.org/10.1186/s13570-019-0150-z.

[8] Corniaux, C., B. Thébaud, A. Powell, A. Apolloni, and I. Touré, 2018. *Cross-Border Livestock Mobility: Challenges for West-Africa*. Policy Brief. Dakar, Senegal: FAO/ CIRAD.

[9] Gonin, A., 2016. "Les éleveurs face à la territorialisation des brousses : repenser le foncier pastoral en Afrique de l'Ouest." *Annales de géographie*, *Armand Colin* 2 (707): 28–50. https://hal.archives-ouvertes.fr/hal-01327150.

[10] Netherlands Ministry of Foreign Affairs, 2018. Climate Change Profile for the Western Sahel.

- Inter-annual variation and spatial variability of rainfall are expected to increase, which in turn increases risks (and affects perceptions of risk).
- Reduced duration of the rainy season, with increased extreme rainfall events in the South.

The region is highly dependent upon subsistence farming, rainfed agriculture, and pastoralist livelihoods. Climate variability and environmental degradation are challenging the viability of these ways of life, with broad-ranging impacts on – and implications for – social and economic systems. For example, as the risk of crop failure increases, farmers will be less willing to invest in inputs, such as improved seeds and fertilizer, because of increased uncertainty about return on that investment, in addition to land tenure uncertainty.

These predicted climate trends cannot be assessed in isolation, as they are exacerbated by the effects of other environmental trends. Rainfall correlates with the area cultivated. During low rainfall years, less produce reaches markets because less land is cultivated and the land that is cultivated has lower yields. The inherent resilience of (agro-)pastoralism to respond successfully to climate shocks is progressively undermined by mobility constraints. Land tenure insecurity will affect agricultural and pastoral productivity directly and indirectly through erosion, land degradation, and water resource depletion.[11] Responses have emerged; there are successful initiatives involving climate-smart agriculture (including adapted short-cycle seeds) and weather and biomass forecasts for farmers and pastoralists. Overall, however, yields have declined over the past decades by 10-20% due to the changing climate and are projected to further decrease by 5-30%. Better and more resilient production systems are needed to curb declining yields, soil degradation, and depletion of soil nutrients.

## 3.5. Gender Equality and Social Inclusion

In the Sahel, women's crop yields are generally 20-30% lower than those of men.[12] Women generally underperform men for several reasons. First, women bear the greater burden of unpaid domestic and care work, such as cleaning, cooking, and caring for household members. Rural women's unpaid work burden is even greater due to the time they spend on collecting water.[13] Women often lack secure land ownership, which discourages their investment in land improvements. Women's access to irrigation and ownership of livestock is still challenged: men own more and larger livestock (such as cattle) than women.[13] Women lack reliable access to loans and demonstrate risk aversion for debt, as their income is often small and stable. Household gender norms often dictate that men control the money and other important resources, such as technical knowledge, fertilizers, and farming implements. Equal access to these resources gives women greater parity with men in terms of production.[14] Women are also less likely to plant high-value crops or hold large ruminants due to gender norms and small land plots, which leads to reduced income. Women often face challenges in decision-making power in both their public and private life.

Outside of their homes, women struggle to access innovative, climate-smart agriculture and pastoralism practices and services due to gender norms that prevent them from moving around freely. For example, women may find it difficult to travel to a service location. Language or literacy barriers can also limit women's movements. The lack of women service providers and extension workers may also play a role in whether small-scale women producers will participate effectively. Gender norms inhibit women from speaking up and asking questions, which might prevent them from fully benefiting from the service.

To some extent, youth face similar challenges as women because young people tend to have limited economic independence. Young people often don't have control over productive processes and assets, especially in a rural setting, where the whole family works on the farm but the resources are controlled by the household head. This dependency is even more severe for young women, as young men often have ways to escape this dependency through education, inheritance of land, and by becoming household heads themselves. To find their independence and to build their own livelihood, young people often leave rural areas and agriculture to look for opportunities in towns and cities.

[11] CILSS, 2016. Landscapes of West Africa: A Window on a Changing World.
[12] Gladwin, 1997. Gender and Soil Fertility in Africa: Introduction.
[13] FAO, 2023. The status of women in agrifood systems.
[14] Estimates show that if productive inputs, such as fertilizer, manure, and labor, could be reallocated within the African household from men's to women's crops, in some societies the results would mean an increase in the value of household output of 10-20%. Gladwin, 1997. Gender and Soil Fertility in Africa: Introduction.

The combination of constraints faced by youth and women in agricultural value chains prevents them from adopting innovations and new technologies as readily as men, which leads to lower productivity. Despite the challenges, there are ways to make interventions more exclusive. For example, service packages by and for women seem to raise the likelihood of women to adopt and invest in the practices. Group-based approaches are important for increasing women's participation, and they encourage the uptake of technology and increase adaptive capacity.

## 3.6. Conflict

With the July 2023 coup, Niger is the last in a chain of countries stretching from Senegal on the Atlantic Coast to Sudan on the Red Sea to experience a military takeover. While there is no one-size-fits-all explanation for the spate of military takeovers among these countries, weak states are a common regional factor, along with frustrated jobless youth, population pressures, and fallout from a changing climate. The net result is that West Africa is among the regions most affected by instability.

The entire Sahelian zone is characterized by increasing political instability. National governments increasingly struggle to maintain control over their territories and are challenged by extremist groups and organized banditry. These groups profit from an increasing discontent among disenfranchised rural populations, born out of a lack of capacity of states to deliver basic public services. These conflicts emerge in a situation where the state is weakened, after decades of neglect of problems in the agriculture sector, and institutional and natural resource management issues. National armies are not able to control the situation and progressively rely on armed militias and foreign armed servicemen to fill the security gap. In the field, an increase in population in the Sahel and in the northern part of the coastal countries, accompanied by an expansion of sedentary farming and sedentary livestock, climate change, an increase in extremism, and a pastoral community that is faced with a reduced access to grazing lands and crop residues, is a toxic mix of elements that results in increasing inter-community conflicts, which are fueling armed conflicts. The general insecurity and conflicts produce an increasing number of internally displaced people and refugees that also have to be accommodated in the zones of intervention. The current zone of conflict is moving south, and it is predicted that the conflict zone may reach the Atlantic Coast in 10 years' time. The conflicts emerge in a situation where the state is weakened, often after decades of neglecting problems in the agriculture sector and elsewhere, basic services are lacking, food insecurity persists, the demographic is exploding, and institutional and natural resource management issues have been neglected.

Apart from the generalized situation of insecurity that makes it challenging to work in this context, at the local level, the region is facing increasing armed conflicts over land, water, and other natural resources between different groups. This situation particularly affects the most vulnerable, especially women and youth, who often have limited access to productive assets and resources, such as land and livestock.

The conflicts most relevant to the ***Soil Values*** program are those between sedentary farmers and pastoralists and those between farmers and sedentary livestock holders. Pastoralists have seen their grazing lands converted to farming or monopolized by sedentary livestock holders. Pastoralists have also seen their migration routes narrowed and sometimes even disappear. Increasingly, young pastoralists are unemployed, which fuels their recruitment in armed groups or gold panning groups. These herder-farmer conflicts interrupt the exchange of nutrients (through manure) that is part of the traditional farming systems. The program's ambition will be to work under conflict conditions but also through conflict-sensitive program management, making sure to Do No Harm and address these farmer-herder conflicts through landscape level management of natural resources to reinforce the complementarity between crop and livestock production systems. The program will indirectly work to attenuate conflict through agricultural intensification. (For more on how the program will operate in conflict areas, see the Adaptive Management section.)

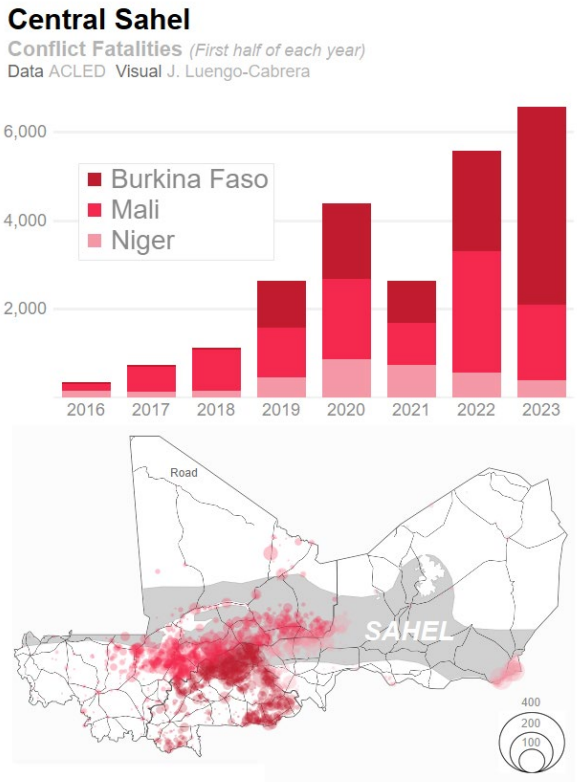



***Figure 5. Level of conflict in the Sahel***

## 3.7. Institutional and Policy Landscape

The ***Soil Values*** enabling environment pathway addresses the capacity of public sector institutions, policies, and governance structures to support long-term soil health investments, which complements the agro-ecological and inclusive market development pathways; combined this drives the transformation of the food system. This needs to be supported by national policies, while international flows of goods and funds must be mobilized in support of the operational activities and institutions strengthening. As fundamental principles of ***Soil Values***, the program embeds its activities in national government programs and policies to develop and mobilize local capacity to effectively implement national strategies and policies. Governments must be able to orchestrate the contributions of foreign aid to support national development priorities but may lack the institutional capability to do so effectively. ***Soil Values*** therefore complements this by partnering with non-state actors (NGOs, CBOs, and private sector) while building the capacity of non-profit and public entities as part of its intervention approach.

Most West African governments have developed agricultural and climate change strategies and policies. In line with the Maputo Declaration (2006) and the Comprehensive Africa Agriculture Development Program (CAADP), initiated by the African Union (2003), national governments have affirmed their commitment to the SDGs and accelerating agricultural development reforms and investments, including food security, reestablishing extension services and subsidy programs, and increasing fertilizer availability (Abuja 2006; Lomé 2023). However, they may struggle to secure the resources and deliver services. In the Maputo Declaration, African governments committed a 10% budget allocation to agriculture. However, instead of increasing, African governments' budgets decreased from 3% in 2001 to about 2.3% in 2019.

IFDC has been the official ECOWAS technical arm on soil fertility management and fertilizer sector development for over 25 years. Soil fertility is emerging as an integral component of the ECOWAS Agricultural Policy. IFDC assists ECOWAS to integrate the voices of its member countries into dialogues and stakeholder consultations on

issues related to logistics, trade, and quality of inputs via the ECOWAS Fertilizer Regulatory Framework. With ECOWAS, the Permanent Interstate Committee for Drought Control in the Sahel (CILSS), and CORAF being the technical coordinating bodies for the FSRP, ***Soil Values*** can directly contribute to their abilities, e.g., by further improving the organization and advocacy capacity of the fertilizer industry in West Africa through the creation of WAFA and, in formal collaboration with CORAF, the development and documentation of technology packages for fertilizer and seeds for all major agro-ecologies in West Africa (https://feserwam.org).

Most recently, ECOWAS, World Bank, IFDC, and IITA supported the High-Level Roundtable on Fertilizers in Lomé, in which West African leaders recognized the urgency to ensure soil health and fertility. Through the Lomé declaration, the ECOWAS countries adopted a 2023 to 2033 roadmap to improve soil health and fertility for the region. The World Bank, another major player in the ***Soil Values*** focus countries, is investing to support the Lomé commitments.

The ***Soil Values*** consortium and knowledge partners are deeply involved with the African Union and soil fertility stakeholders, in preparation for the African Union Fertilizer and Soil Health (AFSH) Summit, scheduled for late 2023, and in preparing for follow-up through the development of the Africa Fertilizer and Soil Health Action Plan. The Lomé declaration and roadmap will serve for debate at the upcoming AFSH Summit. The Summit seeks to build a more vibrant fertilizer market that recognizes soil health.

Collaborative efforts, such as with CORAF, have further facilitated the alignment of national policies with regional objectives and these policies emphasize sustainable land management practices, agroforestry, crop diversification, and the use of organic and mineral fertilizers to restore and maintain soil fertility.

Since the start of COVID-19 and the Russia-Ukraine conflict, soil fertility has moved to the top of the agenda of regional economic communities and national governments, with a focus on ensuring sufficient and efficient supply of fertilizers and stimulating local production of fertilizers. ***Soil Values*** will further strengthen the financing of input value chains transiting mainly through synergies with the AfDB-established Africa Fertilizer Financing Mechanism (AFFM), and- through collaboration with the fertilizer industry, output aggregators and processors and the financial sector - facilitate trade credit guarantee, inputs delivery, and training for all actors in the fertilizer value chain.

***Soil Values*** will further support existing output market information systems of the Sahelian countries by also considering the flows to the coastal countries receiving commodities. Liberalization policies have banished any idea of public intervention in the markets, but the global food and energy crisis of 2007-08 has brought storage issues back to the center of the agenda. Coalition members IFDC and AGRA will seek to leverage regional and national public and private sector initiatives to increase regional trade and food supplies, including national and regional strategic grain reserves established by ECOWAS.

The embeddedness of the Soils Values team in the Institutional and policy landscape is evidenced by letters of commitment from ECOWAS, World Bank, AFFM, AFAP, WAFA, CORAF and OCP, submitted in the first phase of application of the SFGP.

A preliminary inventory of selected national programs by country is provided in an annex (“Institutional and Policy Landscape Overview by Country”) that serve as examples of how these could potentially be integrated into the ***Soil Values*** program. The annexes on national workshop summaries provide additional information.

## 3.8. Financial Services

Soil fertility requires farmers to take a long-term focus on monitoring and improving their soils, approaching them as productive resources that can contribute to stable livelihoods when they are well taken care of. The reality in which most smallholders live, however, is different: day-to-day pressures call for a short-term focus, trying to make ends meet in a survival mode. Many other priorities demand attention before soil fertility management comes into play. Brokering of financial services can potentially provide a solution. Financial services, such as microloans, pre-financing of fertilizers and other productive inputs, and crop insurance, can reduce the risks and uncertainty that smallholders experience. When connected to soil fertility management practices, such instruments can provide incentives for adopting practices while at the same time reducing day-

to-day pressure so that the relevance of managing soil productivity with a long-term focus receives more attention.

***Soil Values*** will therefore connect financial services to inputs and practices for soil fertility management and add them to the bundles that are offered to smallholder farmers. Because the conditions of farmers can vary substantially in terms of soils, climate, water availability, culture, family and safety, also the needs and preferences for financial services are likely to vary. Also here we will therefore not follow a one-size fts all approach, but tailor services as much as possible to the context. Involvement of financial institutions and collaboration with value chain partners and policy in the form of public-private partnerships logically underlies and sets conditions for the brokering of such financial services.

# 4. Country Selection and Targets

This section sets out the rationale for the selection of Soil Values implementation and strategic countries. It further elaborates on the indicative targets based on initial analyses and justification for reaching our high targets in Nigeria.

## 4.1. Country Selection

The country selection by ***Soil Values*** is based on regional political, social, geographic, and climatologic coherence, where comparable production systems cut across the countries. The four focus countries for program implementation activities are **Burkina Faso, Mali, Niger, and Northern Nigeria**. Burkina Faso, Mali and Niger are DGIS food security focus countries. Nigeria is a combination country for DGIS where trade is combined with development cooperation activities. Together, these four countries cover almost the entire West African Sahelian zone.

**Characteristics of Soil Values Intervention Zones**

**Sahelian and Northern Sudan zones (central Mali and Burkina Faso, Niamey-Zinder strip in Niger)**

- Arid and semi-arid lands with heavily leached low-fertility sandy soils. Millet based cropping system.
- Crop-livestock interactions dominant in this agro-pastoral area.
- Animal manure is used for crops. In turn, livestock consume crop residues. Never enough manure to fertilize crops!
- Encroachment by the sedentary population and decreasing land for pastoralists cause growing conflict, fueled and regionalized by political, economic, and religiously motivated movements.

**Sudan Savanna zone (southern Niger and Mali, western and southwestern Burkina Faso)**

- Cotton-based farming systems, monocultures or rotation with other crops, primarily maize.
- Soils with low natural fertility and nutrient depletion will trigger erosion without fertilizers.
- Cotton companies provide cotton fertilizers to farmers; rotational crops use residual nutrients after the cotton crop, but farmers also 'divert' part of the cotton fertilizers to cereals.
- Profits partly invested in livestock as a savings strategy, increasing pressure on pastures.
- Trends emerging toward alternative crops (like maize, soy, sunflower) to drive fertilizer demand.

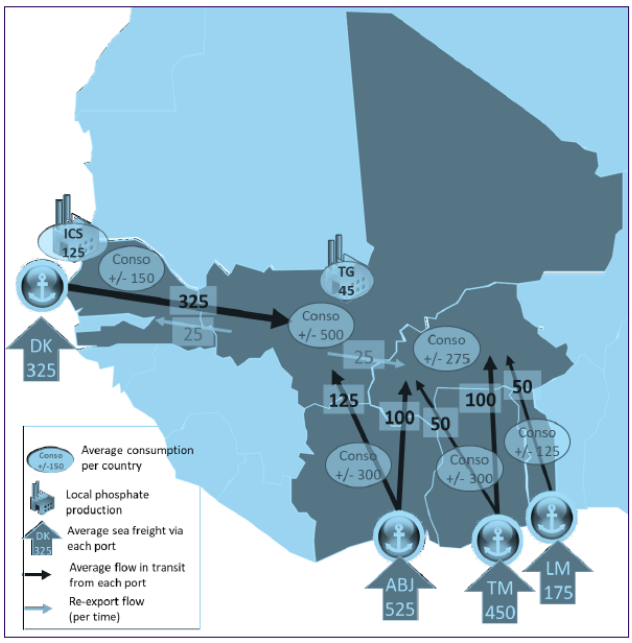
**Northern and Southern Guinea Savannas, (extending westward into Benin, Togo, Ghana, and Côte d'Ivoire)**

- Relatively well-watered, with arenosols (sandy soils) and relatively good lixisols (i.e. soils with a clay-enriched subsoil) and some strongly weathered and management induced acid, red soils.
- Inland valleys with high production potential and double cropping dissect vast uplands.
- Improving soil fertility in the more populated Guinea zone has higher agronomic return on investments compared to the northern zones.

Given the ongoing policies and programs being implemented to enhance regional synergies, **Ghana** and **Côte d'Ivoire**, connecting the Sahel zone with the Atlantic Coast, will be strategic partnership countries with seed money to catalyze strategic discussions. Both countries play a regional role in the south-north trade, consumption of food, and fertilizers and in regional food security. In these two countries, coalition members IFDC and AGRA will seek to leverage regional and national public and private sector initiatives to increase regional trade and food supplies, including national and regional strategic grain reserves established by ECOWAS. In addition, ***Soil Values*** will specify the target agro-ecological areas by overlaying watersheds with programs from World Bank FSRP, coalition partners, and national governments.

## 4.2. Trade and Food Availability Considerations

**Food Trade**. ***Soil Values*** countries in West Africa imported $18 billion in foods in 2018/19, of which 85% came from outside the continent. Total cereal production (rice, maize, millet, sorghum) in the four target countries increased from 40 million mt to 50 million mt between 2010 and 2020.[15] The four ***Soil Values*** implementation countries imported around 8-10 million mt of cereals annually during the past decade, while the import for Ghana and Côte d'Ivoire doubled in 10 years to around 6 million mt in 2020. Sahelian countries produce twice as much cereal per capita as the coastal countries. On the other hand, the coastal countries produce cash crops, such as cocoa.




Source: Consultants, based on customs statistics. Figures are averages over 2015-2018 in thousands of metric tons.

***Figure 6. Fertilizer imports, flows, production, and consumption in six countries***

The food trade between the Sahelian and the coastal countries plays a key role in their shared food security and development, which reinforces the selection of the four target countries. Coastal countries export maize to their northern neighbors, particularly during the "hunger" (soudure) period starting in June; that may reverse later from north to south and also east to Niger. The poultry sector absorbs increasing amounts of maize. There is a total import of 3 and 4 million mt of rice in the four ***Soil Values*** countries and the two strategic countries. There is a substantial trade in re-exported rice across borders, such as from Mali to neighbors. The largest cowpea producers in Africa are Niger, Nigeria, Burkina Faso, Mali, and Senegal. Burkina Faso and Mali are major suppliers to the coastal states, including Ghana and Togo. Given the drought tolerance of cowpea, which makes it particularly adapted to changing climatic conditions in the Sahel, and the growing demand for low-cost protein sources by coastal consumers, the regional cowpea trade will continue to grow. Niger, and to a lesser extent Mali and Burkina Faso, are major exporters of onions to the coastal countries. Niger is the leading onion producer, with more than 95% of Niger's national onion production destined for export, mainly to the coastal countries, including Côte d'Ivoire, Ghana, and Benin. Given the importance of food trade across the region, the ***Soil Values*** selection of countries contributes to stronger coordination and market linkages.

**Fertilizer Imports and Production**. The cost build-up[16] of the four main ports of West Africa (Abidjan, Dakar, Lomé, and Tema) shows that Abidjan is the main port, with 32% of fertilizers imports, servicing Mali and southern Burkina Faso. It is followed by Tema, with significant comparative advantage to supply Burkina Faso with fertilizer. Secondary ports in San Pedro and Takoradi serve as relays, as the period of supply of fertilizer being the same for the whole region (March-August), may cause port congestion and hamper timely availability of fertilizers to farmers. The 15 fertilizer blending units in Ghana and Côte d'Ivoire, could facilitate the provision of fertilizer blends to soil conditions and crop needs.

## 4.3. Setting Country Targets

***Soil Values*** will span three important agro-ecological zones across the four target countries. Each agro-ecological zone spans two or more of the target countries, making any proposed soil fertility interventions relevant across the target region. The entry point for setting targets has been watersheds.

[15] FAOSTAT (accessed July 2023)
[16] IFDC-EnGRAIS, 2019. Cost build-up 4 corridors West Africa.

The World Bank has embarked on a watershed-based Food Systems and Resilience Program (FSRP) that will cover Niger, Mali and Burkina Faso, another benefit of targeting these four countries. ***Soil Values*** will specify the target agro-ecological areas by overlaying watersheds with programs from World Bank FSRP, coalition partners, and national governments. In the map below, watersheds have been georeferenced with the watersheds and intervention zones, focusing on arable land. Through a combination of GIS, FAOSTAT, FSRP targets, literature data, and local expert knowledge, a multilayered map to overlay these areas with land use and population density was produced. In areas where FSRP is not operational, selection will be guided by the desire to have a good spread across different agro-ecologies, conflict risk management and the availability of strong local partners. Areas chosen should ideally be representative of similar agro-ecologies (can be traced from farming system studies and remote sensing/soil maps) – both the farm and watershed characteristics – and the pastoralist interaction. The outcome of this quantitative assessment was a relatively equal distribution in terms of area coverage and number of farmers for Mali, Burkina Faso, and Niger. In each country a total area of 400.000 hectares will be managed sustainably, reaching 300.000 producers. Our overlays indicate a double target for Nigeria reflecting its high population, and agriculturally more intense use of land area.

## 4.4. Justifying Equitable Outcomes

Here we justify, in particular for Nigeria, the high acreage and number of producers that can be reached. ***Soil Values*** will work through partnerships to reach existing beneficiaries and increase expected reach during its inception phase (Year 1). As ***Soil Values*** monitors progress, we will refine and revise targets mid-term (after five years). The current targets reflect potential reach given the population and land surface.

The members of the consortium have activities in all focus countries and the trade corridors of Ghana and Côte d'Ivoire (see figure below). This gives ***Soil Values*** a foundation to build on in each of the focus countries and the region as a whole. The diversity of technical expertise and the network that was already built by the consortium will be fertile ground to start the inception phase of ***Soil Values.*** In order to ensure equitable resource allocation, the inception phase will map out activities and locations, networks of stakeholders, national partners, and approaches already used by the consortium to streamline efforts and analyze how best to use the building blocks of each consortium member.

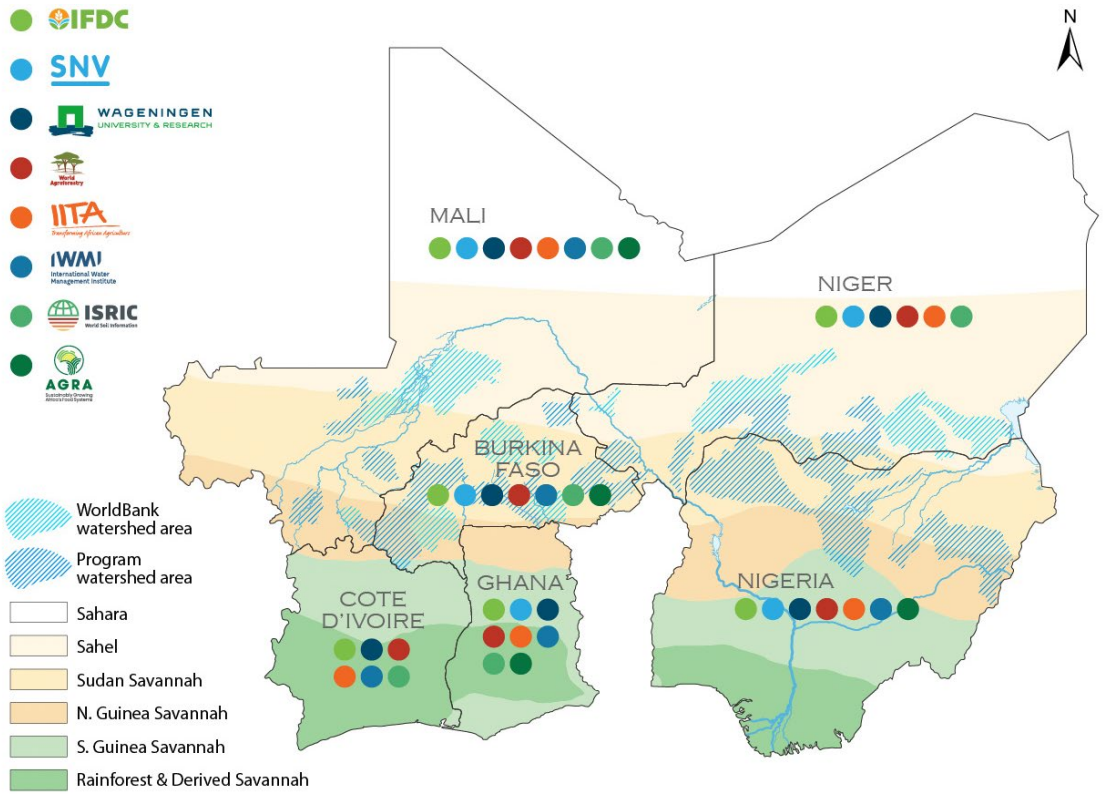



***Figure 7. Soil Values coalition presence in target countries***

Aside from the insights that the ***Soil Values*** consortium brings, it also informs the targets set for the program. Even though ***Soil Values*** will work through existing programs and national partners, earlier efforts in each of the countries will give an image of the targets envisioned for Year 1. For example, IFDC implements programs in Northern Nigeria and these programs provide a benchmark for the feasibility of the ***Soil Values*** targets.

- In two years, the HortiNigeria program (2021-2025, EKN Nigeria) has reached over 34,000 smallholder farmers directly and through agro-dealers as of July 2023. The program will last until 2025 and its aim is to reach over 60,000 smallholder farmers, of whom 50% are youth and 40% are women, who will have increased productivity and/or income.
- Another indication for the target in Northern Nigeria is the Feed the Future Nigeria Rural Resilience Activity (2019-2024, USAID), which facilitates economic recovery and growth in vulnerable, conflict-affected areas by promoting systemic change in market systems. The program has reached over 146,786 smallholder farmers so far and still counting.
- The Extension Service Supervision component of TRIMING assists farmers in four irrigation areas in Northern Nigeria to increase agricultural productivity and value addition of targeted value chain crops through the effective supervision of promotion and dissemination of relevant technologies and innovations. They currently have trained over 83,000 farmers through more than 3100 Farmer Field Business Schools. The overall TRIMING project, under the Federal Ministry of Water Resources in Nigeria and funded by the World Bank, is still ongoing (since 2015) and has reached over 1,065,000 beneficiaries directly.

IFDC's progress toward targets on projects currently or recently operating in Northern Nigeria suggest that the targets are feasible. The reach of ***Soil Values*** will only increase, as the other consortium members will also contribute to the cumulative targets in each of the countries of the program. As the ***Soil Values*** program's strength is to build on existing initiatives, both the quantity and quality of targets will be decided together with national partners. The targets from existing programs will inform the ***Soil Values*** approach and will determine the impact to the end of the program in 2033.

The feasibility of the targets does rely on the security situation in the region, which will be monitored closely. Adaptive management is embedded throughout the Soil Values program – from program governance through to program design, implementation and operations – allowing for changes at each of these levels, to respond to evolving conditions, priorities and needs. An example is the current crisis in Niger of which the impact is not yet reflected in this proposal and will be finalized in discussion with the Soil Values team and with DGIS at the start of the program. IFDC has found that careful planning, partnership agreements, and ongoing monitoring generally supports progress toward targets even in complex environments.

# 5. Intervention Activities

To achieve the expected impacts enumerated in the Theory of Change (ToC), the program will work through five domains or intervention areas. In this section, we describe how we will implement each intervention area, highlighting our major activities, starting with the role that national partners will play in program implementation to ensuring embeddedness, ownership and program sustainability.

## 5.1. Collaboration with National Partners

National organizations including community-based organizations (CBOs), non-governmental organizations (NGOs), government entities, e.g., NARS and private sector entities, are at the heart of the ***Soil Values*** program, as they are the linchpin to program embeddedness, implementation, capacity building, sustainability, and exit. As part of the co-design phase of the proposal, national partners participated in the country-level design sessions. Here, key country-level and regional partners with a long track record of successful implementation and as trusted partners from across the consortium were invited to contribute to the design of country strategies and priorities. They will also be involved in finalizing the Year 1 workplan and subsequently vetted and selected for implementation and be program partners through which the program operates.

IFDC has robust mechanisms for partnering to ensure inclusion, fairness, transparency, technical impact, cost-effectiveness and financial and donor compliance (see text box).

In selection of partners and design of partnerships, attention will be paid to ensure that the public sector and CBO/NGOs partners do not crowd out the private sector, and only intervene in the market in a public good capacity, or in instances of market failures. Where the role of private sector is foreseen, e.g., in bundling or financial access, in service provision (input and output market development, or information and other services), the program will foster competition to ensure that market distortions are minimized. In instances where there are only a limited number of private sector partners, competition and efforts to minimize market distortion will be documented.

**Proposed Soil Values Partner Vetting (adapted from 2SCALE and other program best practices)**

- Partners are identified through a comprehensive partner scoping, as part of the proposal design process and in the first year of program implementation. Most of these partners are based on existing partnerships with consortium members, having a track record of successful implementation.
- At the start of the program, and at regular intervals, calls for Expression of Interest (EOIs) in the broad domains of the project will be undertaken to ensure that a competitive and transparent process is applied to identify partners that may be unknown within the extensive networks of the consortium.
- Partners responding to the EOI will be short-listed based on requirements in the call and form part of a long list of potential vetted partners for program implementation.
- A call for concept notes to partners on the EOI long list is used to solicit concept notes from qualified entities.
- This is followed by co-design of partnership interventions. Following this, the final partnership proposal is presentation to a dedicated Partnership Advisory Committee, which meets quarterly, comprised of external experts. Once partnerships are approved, the implementation (based on the co-created design) is initiated.
- For public entities, e.g., NARS, competition will not be required due to the public good-based nature of the entity.

## 5.2. Intervention Area 1: ISFM Bundled Services and Sustainable Delivery

**The Opportunity**

Proven ISFM practices exist to improve soil fertility and increase yields of small-scale food producers (see text box on ISFM). Achieving sustainable increases in soil fertility while boosting yields requires a complex set of practices to manage soils, crop residues, inputs, water, labor, crop diversification and rotations, and crop-livestock integration, as depicted in the figure below. The extent to which farmers can implement combinations of practices depends on their resource availability and the suitability of practices to the fertility status of their soil. With plant nutrients and seeds to set the foundation, organic matter will boost their impact, while other practices, i.e., “secondary limitations,” including planting density, agro-biodiversity, cropping patterns and crop rotation, water management, and weeding, can further enhance productivity.

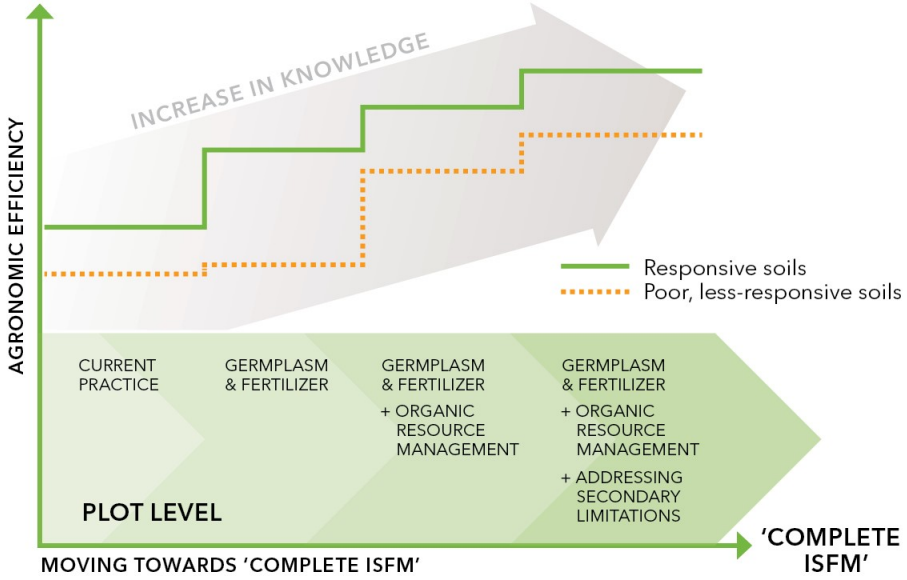



***Figure 8.*** ***Advancement in ISFM practices in farmer fields adapted to soil fertility gradients and resource availability***

To successfully scale these IFSM technologies, ***Soil Values*** will go beyond traditional extension services to include communication, demonstration, and marketing aspects. Transfer of information on the complementary elements of ISFM, including seed use and input-output market linkages especially at the last mile, has proven to be complex. The delivery of complex messages works best if the information is bundled into inputs and service packages and, if delivered by resource people within the community, supported by digital messaging if possible. As these packages are context-specific (climate, soil, crop, labor, gender, markets, etc.), one can reduce complex information into bite-size messages that simplify transfer and delivery of the complementary practices of both increasing yields and building soil fertility and resilience. Targeting messages and input packages and bundles to serve the diversity of smallholder farmer segments, including pastoralists provides opportunity for expanding reach.

### ***Soil Values*** Approach

This process of *agricultural intensification* may in part be due to better agro-biodiversity (i.e., enhanced crop rotation, diversification of crops and crop varieties, and use of improved seed), (better) use of organic amendments, use of site-specific mineral fertilizers, use of soil and water conservation measures, better weeding and pest control, and reduction of post-harvest losses and access to reliable climate information services. The choice of technologies for each bundled package will be based on co-creation with farmers and on their opportunities, problems, and priorities. The technologies will be supported by institutions that improve access to services and inputs, by extension services (knowledge transfer), credit and services such as labor for planting, weeding, pest control and harvesting, soil and weather information, and a better integration in input and output markets.

**Integrated Soil Fertility Management (ISFM)**

To increase yields and maximize the efficiency of land, water, and nutrients, ISFM is a tested approach that combines mineral fertilizers and organic amendments (compost, crop residues, manure) to offset nutrient depletion and build soil organic matter.

ISFM leads to more resilient, sustainable, and biodiverse agro-ecological farming systems when combined with water harvesting, improved germplasm, agroforestry, crop rotation, or intercropping with legumes.

Mineral fertilizer use is an integral and essential element of ISFM. It increases crop production (an immediate incentive for farmers!). It increases the production of crop residues and root biomass to build soil organic matter, which enhances soil flora and fauna. More organic soil matter increases the buffering capacity of the soil for water and nutrients and the use efficiency of nutrients, water, and land. Building soil organic matter increases resilience and mitigates climate change. **In this proposal, soil health equals soil fertility**.

IFDC and IITA are already implementing ISFM in implementation countries. Together, we already have well-tested packages of interventions to improve soils, including the use of mineral fertilizers and organic amendments to offset nutrient depletion and build soil organic matter. These techniques can gradually build up soil fertility, starting with microdosing of fertilizers, and combined with water harvesting, improved germplasm, agroforestry, and crop rotation or intercropping with legumes.

Though proven effective, ISFM practices are generally not adapted to be context-specific and often address a single problem, not the myriad challenges in a specific environment. If such packages are context- specific (climate, soil, crop, labor, gender, markets, etc.), one can reduce complex information into 'bite-size' messages that simplify transfer and delivery of the complementary practices of both increasing yields and building soil fertility and resilience.

**Illustrative Activities**

The program will take the collective experience of its partners and other actors in the region to farmers in the following **five-step approach**:

1. **Inventory existing practices and available services**, including local knowledge, potential new practices and a problem analysis. Where needed, we will introduce new tools and practices. Potential new practices to enhance productivity that will create more resilient systems include: the use of fertilizer (from micro-dosing to a more balanced fertilization), improved seed, increased use of legumes and rhizobia, ground cover, farmer-led irrigation, improved agricultural and agroforestry practices and to increase recycling of organic amendments in the system.

   **Agro-Biodiversity to Enhance Systems Resilience**

   Since 2008, Sahelian governments stimulated crop diversification by smallholder farmers to diminish their dependence on cotton for income and/or as a response to food trade disruptions. Programs introduced new high-yielding and marketable varieties of food crops, such as rice, sorghum, maize, groundnuts, and cowpea. Several governments have facilitated access to agricultural inputs through subsidies (fertilizer, seeds), which has contributed to production increases. Nevertheless, a large part of those production increases was a result of bringing more land into cultivation, rather than improving crop yields or labor productivity.

2. **Co-design and test bundled practices**: We will work with farmers – per country – to co-create demand-based ISFM bundles (to manage soils, crop residues, manures, inputs, water, labor, SWC, agro-biodiversity, and crop-livestock integration) for different agro-ecological zones and different farmer profiles (e.g., socio-economic status). Farmers will choose from a selection of bundled technologies based on their priorities, with simple trials conducted on their fields. Farmers can select one key variable technology (such as variety or fertilizer rate) for testing on their own fields. A key element explaining the productivity gap is lower returns to agricultural advisory services and information for women. The information that women farmers receive is often less beneficial for increasing productivity than the information obtained by men.[17] Our testing will be GESI-responsive and consider gender-specific variables (time spent on practices such as weeding, ease in harvesting, ease in extracting seed from the crop) to ensure its effectiveness with women.

[17] FAO, 2015, Enhancing the potential of family farming for poverty reduction and food security through gender sensitive rural advisory services.

**Our GESI Approach**

The Gender Equality and Social Inclusion (GESI) analysis can help to identify and address the underlying structural, social and gender inequalities that prevent women and youth from accessing fertilizer, financing, and other productive resources. Aside from gender, there are numerous factors such as age, class, socioeconomics, ethnicity, way of life, disability and education level that can limit or create opportunities. A thorough analysis of these factors in each country can support an intervention to be more GESI responsive (meeting women's and youth needs based on a gap analysis). Subsequently, social behavior change (SBC) methodologies such as intergenerational household dialogues, community fora for sensitization, husband schools/GESI Champion programs for men, and SBC communication campaigns (print/social media/radio/SMS) together with strengthening activities, such as youth and women's leadership training, financial literacy, and advocacy skill building, can reduce discriminatory social norms. to help create a more enabling environment for women and youth smallholders and pastoralists. Together with the national partners, the Soil Values consortium will build on its experience GESI and the specific context in the Sahel, to fully integrate women and youth into the proposed activities and ensure that they also benefit from the project. To this end, we will identify women-led organizations and seek to partner with them.

3. **Demonstration of bundles on farmers' fields**: We will select best-bet technologies prioritized based on farmer demand and that are bundled and demonstrated on farmers' fields. Based on the preferred choice, our team will demonstrate the best bet on 20 farms within a homogeneous geographic area. In farmer field days, the results will be evaluated, and the technology bundle may be slightly modified if necessary. The improved technology is always compared to traditional practice.
4. **Pre-scaling**: During the pre-scaling, any farmer who is interested is invited to participate. These farmers will implement bundled technologies on at least 0.25 hectares of land. In this phase, the program will work with input suppliers and extension and marketing parties to analyze the scalability of the farmer-evaluated and prioritized bundled technologies. Variables such as timeliness of input supply, ability to provide technical support, GESI aspects (including produce quality, ease of implementation) as women and youth will be implementing the bundle at a larger level, environmental aspects, and economic productivity and profitability aspects will be jointly evaluated and a final bundle to be advanced by the extension system will be agreed upon.
5. **Scaling and phase out**: The most important scaling agent is the farmer who was involved in the testing, demonstration and pre-scaling. S/he knows the interventions inside out. Second, there are the local extension staff that have been involved in the whole process and the private sector partners that sell the seed and the fertilizer and that provide the financing. Together this team will work with our local implementation partners on a scaling strategy to take the bundled services to scale. The program will support this process with "training of trainers" for additional extension workers, private sector partners and policy makers. The program will continue to support scaling but will phase out its involvement over time. The great advantage of a 10-year program is that we will be able to make sure that a set of bundled interventions finds its way into the system in a thorough way.

This broad intervention framework provides a flexible template that can be adapted to specific contexts. For example, in Niger, ***Soil Values*** will encourage adjusted crop selection and provide advisory support to rice, tomato, millet, groundnut, sesame, and moringa, among the priorities. The crops have the potential to contribute to food security. The combination of adjusted crop selection and advisory support will increase the adoption of proven agricultural and fertilization best practices in the country, such as assisted natural regeneration, ISFM, crop rotation, intercropping, crop diversification, mulching, and rotational grazing, among others. All these activities will support the identification and typology of adapted and contextualized fertilizers and inputs (ISFM, inputs, seeds, etc.) and create a bigger impact in Niger.

In contrast, in Mali there is an interest in approaches developed by IFDC, SNV, ICRAF, and IITA, including fertilizer technologies (fertilizer deep placement [FDP] and microdosing [MD], the 4Rs of Nutrient Stewardship, etc.), soil and water conservation techniques (stone cordons, organic manure production, grass strips, bunds, cover crops, agroforestry), and good agricultural practices (crop rotation, adapted seeds, geographic information system, drip irrigation). Given the low soil fertility in Mali and the rate of expansion of cultivated areas, adoption of an ISFM approach, which promotes land conservation techniques and good farming practices, will align with Mali's needs, national policy goals, and ***Soil Values*** expertise.

| Anticipated accomplishments |
|---|
| • A proven set of bundled of integrated watershed/landscape management practices and services comprising technologies, finance opportunities, and marketing that raise yield levels and improve profitability significantly are available and cover 1.5 million farmers (800,000 female). |
| • 1.5 million farmers (800,000 female) are capacitated and familiar with the bundling approach and can navigate within the sphere of individual interventions to meet their own specific needs and/or to respond to their own specific circumstances. |
| • Supporting structures in civil society and government organizations are strengthened to work with the concept: they can adapt the bundled technologies to new conditions, areas, and farmers. |
| • Input and output and service networks function in a conducive way and support farmers and value chain actors in an effective way. |

## 5.3. Intervention Area 2: Integration and Co-Design Community and Watershed Approaches

**The Opportunity**

Interventions at the individual farmer level need to be integrated in landscapes and watersheds. This will allow the farmers and communities to tackle the higher level issue of communal resilience to climate change, to make sure that water, wood, and soil are managed collectively to address the farmers' collective needs, and to make sure that there is equitable and conflict-free access to grazing by pastoralists and local livestock owners. A landscape/watershed-level approach to the management of communal natural resources will provide a safe and conducive environment for farmers to invest in their agricultural productivity.

***Soil Values* Approach**

***Soil Values*** will link smallholder efforts at farm-level to interventions at the watershed/landscape level to ensure interventions are sustainable and contribute to soil fertility improvement at a regional scale. We consider biodiversity, including trees, shrubs, and grass corridors, while balancing crops and livestock, as essential for sound agro-ecological development. Examples are placing grass strips and bunds, combining tree crops with arable crops, participatory mapping, modeling and scenario development to assess water cycles and land-water systems, and protecting common lands. In these landscapes, pastoral mobility and corridors are considered alongside the need for crop land. For example, the ICRAF-led Regreening Africa and IWMI-led Participatory Planning for More Inclusive and Sustainable Water Management in Rural Areas in Burkina Faso program (PP4MIS) demonstrated the value of these technical and participatory approaches to restore degraded landscapes to enhance sustainable land and water use.

**Existing Tools and Capacity**

Our team offers a range of existing approaches and tools, including:

- Community and local governance-based planning (SNV)
- Integrated approaches for land stewardship (WUR)
- Integrated participatory and inclusive water management (IWMI)
- Landscape-level agroforestry and soil health monitoring (ICRAF)
- Cropping systems (IITA)

**Illustrative Activities**

1. **Conduct stock-taking and selection**. In Year 1, we will take stock of ongoing watershed – integrated landscape-based programs in each county and select watersheds – landscapes based on the presence of FSRP, farming systems, coalition and local partners programs (2SCALE, EnGRAIS, PARSEN, and ISSD/Sahel) and country programs. When the information is not already available, we will map natural resources (forest cover, water resources, common lands, grazing land, crop land, agroforestry), grazing patterns, and pastoralist corridors and identify stakeholders, such as farmer groups, women's groups, and pastoralist groups. We analyze women's and youth's access to and ownership of land and infrastructure (such as livestock watering points, community-managed solar irrigation systems, and their possibilities to acquire land-titles) and co-benefit from these. In Burkina Faso, Mali, and Niger, the entry point for watershed-level interventions for ***Soil Values*** will be the World Bank-financed FSRP. This program aims to work at the watershed level and combines a watershed approach with a food systems approach.

2. **Co-create socio-economic and agro-technical interventions** to support an integrated landscape management plan (with attention to GESI and community management). We will not duplicate existing plans, but rather co-design complementary activities with interested programs and projects that are specific to soil fertility management. We will participate in consultative processes between farmers, agro-pastoralists, pastoralists, local community leadership, the private sector, and intervening projects to identify the key governance and conflict issues that must be addressed to put in place integrated and inclusive watershed-landscape approaches.
3. **Assist in the development of integrated watershed/landscape plans**. We will contribute, if necessary, to studies on specific constraints articulated by policymakers, including climate change vulnerability, hydrological aspects, agricultural productivity, farming systems, soil fertility status, socio-economic activities, community practices, local power relations, and GESI of the watershed and, from that perspective, provide input into the integrated watershed plan.
4. **Support the process of demonstrations and pre-scaling and scaling activities**. We will build the capacities of local partners to independently implement the activities above-mentioned activities. We will ensure that the concerns of women and potentially vulnerable groups are factored into bundled solutions and that they have a voice in making decisions, monitoring progress, and reaping the benefits of that progress.

In initial consultations during this proposal design process, national partners identified a range of ideas for integration. For example, in Niger participants identified a need to address access to food and water for herders and farmers, which could reduce recurrent conflicts over resources. An initial list of solutions was identified including investing in pastoral production, promotion of forage crops, reclaiming and sowing reclaimed land, and combating bush fires. In contrast, Mali has undertaken various initiatives that could help to preserve agricultural land and improve soil fertility by halting deforestation. ***Soil Values*** may support Mali to make progress toward its voluntary national targets, such as increasing forest coverage to 26% of the total land area and increasing agricultural production and preserving ecosystems with a net improvement in vegetation cover of 10%.

| Anticipated accomplishments |
|---|
| • ***Landscape*****:** 40+ river basins/watersheds, covering 2 million hectares, have **at least two** soil and water conservation practices in place; an increase in trees and shrubs and grasses for fodder; adequate fuelwood, fruits and non-forest products; livestock corridors; and operational pastoral waterpoints. |
| • ***Actors capacitated***: Government agencies, farmers (especially women and youth), pastoralists, and CSOs are capacitated to co-develop GESI-responsive integrated watershed/landscape management plans and work together in the technical and socio-economic implementation of these plans. |
| • ***Documentation***: Well-documented participatory approaches and guidelines, manuals and facilitator guides, and lessons learned are shared with the wider community of practitioners and policymakers. |
| • ***Data***: Open, interoperable, and reusable data and knowledge products are available to facilitate and accelerate future research and innovation and decision support for diverse actors, including farmers, researchers, policymakers and others in the public and private sectors. |
| • ***Policy***: Policymakers at local and national levels have created a conducive policy environment for community-based watershed management. |

A key consideration will always be to bring farmers, local livestock owners, and herders to the table and to integrate their systems and collaborate to identify win-win solutions to ensure peaceful co-existence. Farmers, local livestock owners, and pastoralists, with the support of local governments and CSOs, need to agree to negotiate corridors and the timing of livestock migration.

## 5.4. Intervention Area 3: Brokering Finance

**The Opportunity**

Soil fertility requires farmers to take a long-term focus on monitoring and improving their soils, approaching soils as productive resources that can contribute to stable livelihoods with appropriate care. Many smallholder food

producers face day-to-day pressures that may demand a short-term focus, trying to make ends meet in a survival mode. Many other priorities demand attention before soil fertility management comes into play. Brokering of financial services can potentially provide a solution. Financial services, such as microloans, pre-financing of fertilizers and other productive inputs, and crop insurance, can reduce the risks and uncertainty that smallholders experience. When connected to soil fertility management practices, such instruments can provide incentives for adopting practices while at the same time reducing day-to-day pressure, so that the relevance of managing soil productivity with a long-term focus receives more attention. ***Soil Values*** will connect financial services to inputs and practices for soil fertility management and add them to the bundles that are offered to smallholder farmers. Since farmers' conditions vary substantially in terms of soils, climate, water availability, culture, family, and safety, their needs and preferences for financial services are likely to vary, so we aim to tailor services to the context. We will involve financial institutions, value chain partners, and policymakers in the form of public-private partnerships to set the conditions for brokering services.

Developing financial instruments for soil fertility management corresponds to a need to engage smallholder farmers in soil fertility-restoring practices, as it takes time for such practices to deliver benefits that are visible to farmers. Bundled packages (Intervention Area 1) offer a tangible alternative in terms of increased yields without mining nutrients. Bundled inputs leverage ecological synergies: improved seeds added to appropriate fertilizers and better water use result in an overall balanced output increase and use efficiency of those resources. Finance packages aim to co-create financial solutions with the private sector, financial institutions, and public funds (blended finance) that lead to scaling and adopting (gender-responsive) soil fertility practices.

***Soil Values*** **Approach**

Finance is a *sine qua non* to develop the fertilizer sector. Currently, short-term costs of unsustainable practices (like slash-and-burn agriculture) are low, and investments in ISFM and landscape interventions are long-term and expensive. The costs of long- and short-term investments need to be reversed in favor of sustainable investments.

**Illustrative Activities**

***Soil Values*** will broker and direct private and additional public sector investment in sustainable soil fertility management, going beyond financing for fertilizers. We need to support governments and national financial institutions to develop investable, fundable opportunities with viable business cases around long-term soil fertility and landscape management to access climate funds and other concessional finance mechanisms. ***Soil Values*** will develop sustainable input channels and integrate inclusive financial models – as tested in 2SCALE – and the risk-sharing model tested by partners into the bundled inputs and service packages to promote access and adoption. Developing finance models to target soil fertility explicitly will take time, but a common vision and focus, driven by ***Soil Values*** coalition partners, that guide collective action, are expected to lead to additional soil fertility finance.

From proven finance models to soil fertility finance. ***Soil Values*** will leverage the €100 million Netherlands Government investment to broker and direct private and additional public sector investment in sustainable soil fertility management, going beyond 'financing for fertilizers.' This investment is a new ballgame.

**AFFM, trade credit guarantees, and AGRA/IFDC**

IFDC and AGRA have been at the forefront of supporting the African Union and the AfDB in creating and promoting the AFFM, which supports the private sector in accessing finance to make fertilizers available.

The AFFM credit guarantee was designed based on the experience of AGRA and AFAP between 2014 and 2016, when a U.S. $6.4 million guarantee fund was leveraged to enable fertilizer companies to provide stock of fertilizers to 91 hub agro-dealers to the tune of U.S. 496 million in Ghana, Mozambique, and Tanzania. Over 3,000 rural agro-dealers and 7 million farmers benefited from this increased availability of fertilizers at the time these inputs were needed.

| Program Parameters | |
|---|---|
| AFAP Guarantee Fund Balance (USD) | 6,400,000 |
| | |
| Years Operating | 2 |

| To Date Activity | |
|---|---|
| Total Value of Credit Extended (USD) | 227,000,000 |
| Value of Fertilizers Financed (USD) | 496,000,000 |
| Volume of Fertilizers Financed (mt) | 620,000 |
| Total Guarantee Fund Turnover | 35.5 |
| Avg. Annualized Turnover | 17.7 |
| Loss %'age to Date | 0.2% |

| Gurantee Fund Total Leverage Factor* | |
|---|---|
| Since Inception | 77.5 |
| Annualized | 38.7 |

* Total value of fertilizers financed divided by the value of guarantee funds



***Figure 9. AGRA innovation in hub dealer-rural agro-dealer and farmer de-risking***

To also de-risk the (in-kind) input credit between hub dealers, rural agro-dealers and farmers, AGRA has developed an innovative trade credit guarantee scheme in Mozambique and Malawi that can be replicated in the West African region through AGRA's partner bank network.

AFAP, co-created by IFDC, has become the leading African institution in smallholder fertilizer finance. AFAP is managing fertilizer credit guarantee funds for AFFM, commercial banks (including Afrexim Bank), and large fertilizer companies and is in discussions with the Dutch Entrepreneurial Development Bank (FMO) to expand their portfolio. Per AFAP's letter of support included with our concept note, the organization is on standby to support ***Soil Values*** to take fertilizer finance to the next level, where the focus will be on both farmer productivity and building soil fertility. WUR's experience with the adoption of improved soy seed, fertilizer, and inoculant showed that offering a bundle that included the combined inputs in quantities suiting the average farm size, bundled with a pre-paying microloan and an output market contract, increased adoption from 15% to almost 80%. The coalition will follow such approaches by integrating loans in bundles of inputs and services to stimulate smallholders' adoption of fertilizers and other tools to improve soil fertility, along with seeds, access to output market contracts, microloans, insurance, and information). As such, these bundles connect the input, smallholder, and output market stages of the value chain and make soil fertility management an integrated element of the market system.

**The Example of QUALIRIZ**

By strengthening the actors in the rice value chain in Burkina Faso, in the Quality Rice for better Income (QUALIRIZ) project, farmers can enhance their yields, e.g., by applying microdosing or urea deep placement, engaging in post-harvest activities, especially women, and marketing their produce collectively, thus improving their capacity to adapt to shocks and stresses. The intent was to promote local production of organic fertilizer to deal with the crisis of mineral fertilizers by promoting biomass (straw and rice husk), abundant in the plain of Bagré. This provides a way for provision of financial services for long-term solutions to soil health. The AGRA approach included the training of a local promoter interested in setting up a pilot center for production as well as training of young people; support to a research institution for adaptation and supply of equipment for compost production by private promoter, and the distribution to farmers of the community. AGRA leveraged its existing partner financial institutions for their education on the opportunity of extending equipment, finance, and working capital finance for this activity. AGRA also intends to continue exploring the possibility of mobilizing concessional financing to develop the market through climate finance to increase the potential for financial products provision by financial institutions. This will go a long way in addressing the constraints of shortage of mineral fertilizers in the long term and maintaining the government's enthusiasm for agroecology and sustainable health soil restoration practices.

| Anticipated accomplishments |
|---|
| **At the farmer level:** |
| • Financial instruments that reward long-term investments in soil fertility are available to farmers. |
| • Local institutions are willing and able to manage these instruments. |
| • De-risking mechanisms for these instruments are available, and institutions that can manage these instruments are able and willing to make them available. |
| • Farmers successfully use the instruments and are thus able to invest in long-term soil fertility improvements. |
| **At the national level:** |
| • National-level financial institutions collaborate to facilitate long-term soil fertility financing. |
| • Guarantee funds are conceived and operationalized that support these finance mechanisms. |

## 5.5. Intervention Area 4: Convening

***Soil Values*** will use its convening power to address market failures, correct policy or regulatory gaps, and accelerate mainstreaming of ISFM into national and regional initiatives. Our convening activities will build on our existing coalitions and relationships with governments, regional economic communities, commodity boards, the fertilizer and agribusiness industry, and other soil actors to mainstream the understanding of ISFM for future policies and investments.

Examples of how the ***Soil Values*** coalition will leverage our networks include:

**Convening for the right fertilizer for the right crop and soil**. With a fertilizer consumption of 3-4 million mt, West Africa accounts for 40% of total sub-Saharan African fertilizer consumption; 70-90% of fertilizers are procured by governments, commodity boards, cotton companies, and large-scale producers, mainly for use on cash crops: cotton, cocoa, coffee, oil palm, rubber, and sugarcane. Irrigated rice (in Niger and Mali) is also an important market segment, while fertilizer use on maize has increased. In Burkina Faso, Mali, Niger and Nigeria, fertilizers are partially subsidized, and the NPK formulas for cash crops are also diverted to food crops. *Through convening, all soil actors will gradually understand the need to develop localized crop- and soil-specific fertilizers and integrate these into crop- and soil-specific recommendations.*

After an initial stocktaking in Year 1, ***Soil Values*** will identify existing convening structures for multi-level soil fertility conversations. Together with stakeholders, we will develop a strategy on how to integrate soil fertility into the regional and respective national and sub-national agenda. Based on the strategy, ***Soil Values*** will trickle down to national and sub-national events.

**Convening for last-mile delivery through public-private partnerships**. Although two decades of agro-dealer development projects have improved last-mile delivery, farmers still have insufficient and timely supplies of inputs, aggravated by poor road infrastructure. ***Soil Values*** convening activities will involve collaboration with initiatives such as EnGRAIS to assess the state of infrastructure required to promote the trade of agricultural inputs in West Africa and identify strategic investment opportunities for countries and the private sector. Ports, roads, and rail networks are underserviced, and there is a distinct lack of adequate warehousing facilities. As a result, stored fertilizer deteriorates significantly in quality. The more significant fertilizer industry players are increasingly improving their logistics but do not have the ambition or capacity to improve last-mile delivery. Global industry instead works through local private networks and government distribution systems to build an ecosystem of services to channel their products to farmers. IFDC's and AGRA's past work on agro-dealer networks and community-based advisory services has improved last-mile delivery services, but additional convening is necessary.

**Convening for better policies**. IFDC continues to support the development and harmonization of fertilizer policy and legislation in West Africa, focusing on fertilizer introduction and improvement. AGRA's convening role increasingly covers the entire farming systems and national, regional, and continental levels. ***Soil Values*** will draw on existing networks to convene at the regional and national levels to include soil fertility in farming systems context in future policies and regulations.

**Convening on a global scale**. In developed nations, the negative environmental impacts of improper fertilizer use influences global debates and policies about agricultural production systems, sometimes resulting in pledges to abolish external inputs, including fertilizers. While excessive use of fertilizers in developed countries causes severe environmental problems, northern perceptions cannot be transposed to the African continent. ***Soil Values*** will contribute to the global dialogue for the benefit of the Sahel (and for Africa in the broader sense) and counterbalance divergent views on food and environmental policies and practices. ***Soil Values*** will provide scientific evidence and proven practices to global, regional, and national convenings to contribute to building consensus for the continent. IFDC and SNV are considered strategic partners of the Netherlands Ministry of Foreign Trade and Development and will provide the Ministry with evidence-based arguments to convincingly address incorrect perceptions about the use of external inputs on the African continent.

## 5.6. Intervention Area 5: Scoping Innovations and Program Learning

**The Opportunity**

A 10-year program, which from the outset positions itself in the ongoing discourse around soil fertility improvement and sustainable farming and at the same time has its own experiences to share, can shape the debate on soils. This can be at the community level, the national (policy) level, and at the regional level. ***Soil Values*** has the time to both educate and deploy talent to contribute to the pool of well-trained professionals who can serve the region, countries, and communities.

At the technical level, the ***Soil Values*** coalition anticipates that evidence in support of new and improved ISFM technologies and approaches will continue to emerge locally and globally. The emergence of African institutions, including universities and research centers, capable of fostering and sustaining innovation in improving soil fertility and integrated landscape and watershed management must be nurtured.

***Soil Values*** **Approach**

***Scoping***

Our team seeks to facilitate the flow of innovations and approaches to and within the region, supporting adaptation and adoption of technologies and approaches within local contexts. We focus on two levels:

- *Building an innovation ecosystem*. Many Sahelian development and private sector actors are investing in new methods and technologies to address soil fertility and productivity issues and environmental/ ecological degradation. As a long-term (10-year) and significant actor, ***Soil Values*** will liaise with these initiatives to adapt and implement proven approaches in our intervention portfolio. At the same time, we can incubate these dispersed efforts to become part of a soil fertility innovation ecosystem where experiences can be shared, stimulated, further developed, and applauded.
- *Targeting emerging issues*. A second function is to signal trends relevant to the soil fertility discourse. This can be a simple analysis of food and input prices, establishing a link between pricing and use of inputs, trends in national fertilizer policies, approaches for last-mile delivery systems, social-economic and ecological approaches, and constructs that enhance adoption. An example of an emerging issue relevant to the region is the impact of the presence of internally displaced people and refugees on land use and the social implications of their presence. The implications of these impacts deserve analysis and sharing. It can also be as complex as anticipating and interpreting the impacts of climatic changes and weather variability in the Sahelian zone on temperature and rainfall and sound ways to cope with the variabilities. ***Soil Values*** will act as an honest broker of this information and share it with relevant stakeholders to stimulate debate and to learn from different approaches to the same issue.

***Learning***

***Soil Values*** will be a (self-)learning program and will try to inspire others (programs, governments, private sector, CSOs, scholars) to learn together. The learning will be approached as a co-creation process and conducted with different target groups, from academia to policymakers, to businesses, to development practitioners, and to farmers and pastoralists. The lessons learned will be incorporated into the ongoing program.

Specific to the learning approach will be the development of a strong academic foundation around the subject of soil fertility management, which has the following elements:

- *A PhD program*. This sandwich PhD program is targeting talented professionals that will be able to return to their current assignments after completing their PhDs. They will be enrolled in sandwich PhDs at Wageningen UR and will be supervised by both a host country university and WUR. Their PhDs will enhance their authority in their field and strengthen their position in the soil fertility policy and development field, while enhancing the capacity of regional and national institutions to deal with soil fertility issues.
- *An MSc program*. The MSc program aims to strengthen the capacity of universities in the region. To this end, WUR will help set up MSc-level courses at these universities and will use guest lecturing as a means to train local staff. At the same time, this will allow for WUR MSc scholarships to educate talent from the participating countries.

Part of the scoping and learning will be a sharing strategy. At the national level, annual workshops will be held with all the partners to gauge progress, share and resolve issues, and identify opportunities. At the regional level, the program will use the AGRA Africa Food Systems Forum (formerly AGRF) to share its lessons learned. The consortium will use its relations with regional bodies (ECOWAS, CORAF and others) to be present at the various regional meetings to share its lessons learned and to scope for interesting new initiatives and knowledge.

**Pathways to Agro-Ecological Intensification in Southern Mali (2012-2024), implemented with WUR in the lead**

The Pathways to Agroecological Intensification (AEI) project follows a co-learning approach, whereby farmers and researchers collaborate to identify AEI options that fit the diverse farming contexts. Besides technical solutions to improve crop and livestock production, we co-develop farm management tools, ways to manage risk, and support farmers to engage in local value chains. Together with local stakeholders, we identify the requirements of a transition toward sustainable and resilient farming systems. Results reached so far:

- Capacity building of BSc, MSc, engineer, and PhD students.
- Baskets of AEI options for different farm types, gender groups, agroecological and socio-economic contexts tested and evaluated for different criteria.
- AEI pathways and their effects on agricultural productivity, income, environmental indicators, food security and nutrition at farm, community, and regional levels.
- Farm planning and budgeting tool developed and tested with farmers for better farm decision-making.
- Better informed risk management by farmers.
- Facilitating co-learning processes between researchers and local stakeholders.

**Illustrative Activities**

This is a cross-cutting intervention area that is not linked to one specific output, but rather to all. The team will:

1. Start with a strategy design for the intervention area Scoping and Learning (WUR with ICRAF and IITA) and for formal training/formal (program) evidence-based education (WUR in the lead, with IFDC and IWMI); then the team connects with like-minded initiatives in the public, private, and not-for profit sector.
2. Create coalitions with like-minded initiatives to jointly work on technology development, papers, exchange visits, etc. The actual activities will take place in Years 2-5.
3. Develop a lessons learned medium (online), in the form of a podcast, supported by documentation, to further share the information collected and to share lessons learned during ***Soil Values***.
4. Work with WUR on 5 PhDs and a series of 10 MSc degrees on topics relevant to the five intervention areas.
5. Train and support the four country teams to contribute to the above.

In Ghana, the government is requesting IFDC's Fertilizer Research and Responsible Implementation (FERARI) program to assist in more effective implementation of their Planting for Food and Jobs (PFJ) program and to build a contingent of local professionals. These professionals will acquire the experience and skills that will be required in the future to improve policy, governance, research, and private sector engagement to improve soil fertility, while staff is changing their perspectives with regard to the latest soil fertility paradigm thinking. FERARI has integrated research of over 50 MSc students, supervised by national and international scientists, to develop the evidence base for implementation activities to support the PFJ. It thereby uses advanced analytical (machine learning) methodologies for spatially explicit recommendations, remote sensing and drone observations with ground truthing, farmer-managed fertilizer-yield response trials, farm household surveys, power relations among value chain actors, and market analyses. IFDC is experienced in assisting in the development of university studies on fertilizer sciences and is currently supporting the University of Cape Coast in Ghana to set up a transdisciplinary MSc course on Fertilizers and Soil Health at the request of the Ghanaian Government.

| Anticipated Accomplishments |
|---|
| • Active linkages with like-minded initiatives in the public, private, and not-for profit sector. |
| • Technical and process information collected from these like-minded initiatives, with special attention to gender and youth, financing mechanisms, and soil fertility and watershed management. |
| • Coalitions created with like-minded initiatives to jointly work on technology development, papers, exchange visits, and other gatherings, with published results. |
| • Capacity building for local institutions by facilitating staff to obtain sandwich PhDs at WUR on topics relevant to the program. |
| • Strengthened MSc education at local universities on topics relevant to the program. |
| • MSc students educated at national at local universities, including development of MSc education and support to MSc students on topics relevant to the program. |
| • Trends signaled that are relevant to the soil fertility, ecological sustainability, soil fertility-related GESI issues, and climate change and resilience discourse through relevant thematic analysis (food and input prices, link between pricing and use of inputs, trends in national fertilizer policies, approaches for last-mile delivery systems, socio-economic approaches, and constructs that enhance adoption and participation of women and youth). |
| • Relevant thematic analysis shared with relevant stakeholders to stimulate debate and to learn from different approaches to the same issue. |
| • The world outside the direct partner network scoped for innovations relevant to the program. |

## 5.7. Program Workplan – Overview of 1-, 5- and 10-Year Plans

### 5.7.1. Co-Design in Collaboration with National Partners (Year 1)

During the first year of the ***Soil Values*** program, the focus will be on program setup, including personnel and offices, and initiation of program activities, with parallel tracks for activities related to: technical implementation, program finance, and program governance. The Year 1 workplan can be found in Annex 6. IFDC commits to having the Program Director and senior staff in place in the first month of implementation, and by the third month, the complete staff required for Year 1 and all offices will be established, as well as related program activities, such as the required security assessments. A program kick-off meeting will take place in the first month of the program, with senior program staff to initiate activities.

In the first year of the program the Monitoring, Evaluation, Learning, and Sharing (MELS) activities will be initiated, a MELS system established, and the required baselines established for program monitoring. Activities in each of the intervention areas will also be initiated, including the required assessments, inventories, and strategy development, and co-created with consortium and national partner selections undertaken to start implementation of activities in Year 2. Technologies, watersheds, and country intervention zones will also be selected for initial implementation.

### 5.7.2. Implement, Evaluate, Learn, and Adapt (Years 2-5)

The focus of Years 2-5 is on implementing and scaling activities, with concurrent evaluation, adaptation, and learning embedded into and informing the workplan. ***Soil Values*** will develop and implement a capacity building plan (see further below) by advancing PhD and MSc candidates, strengthening the capacity of professionals and that of national partners (CBOs, NGOs, and public sector entities).

***Soil Values*** will provide evidence-based materials on improving soil fertility for advocacy, media, and end-users, customized to target groups, and suitable media while organizing learning journeys to exchange achievements. Program learnings will inform adaptation and upscaling, as will the programs adaptive management approach, discussed further below. Year 5 will end with an external program evaluation.

### 5.7.3. System Scaling and Leverage

***Soil Values*** will achieve scale and impact through two categories of partners: scaling partners and leverage partners. Scaling partners are national and regional CBOs, NGOs, and public and private sector entities through which the program will scale as well as complementary long-term programs and investments by DGIS, Netherlands embassies, and other donors and development partners with which ***Soil Values*** can align synergistically. Examples of such programs include the Pro-ARIDES for resilience and food security among farmers and (agro)pastoralists in the target countries, 2SCALE for market development, and various Embassy of the Kingdom of the Netherlands (EKN)- and DGIS-funded seed sector development activities, such as HortiNigeria and ISSD/Sahel.

Leverage will come from alignment with large bilateral and multilateral programs, such as the World Bank-funded FSRP, AfDB's TAAT program, AfDB's AFFM, and the African Fertilizer and Soil Health Action Plan to be developed following the AFSH Summit (Q4 2023).

Additional leverage and impact will come from the additional minimum of €300 million of cost-share and leverage that ***Soil Values*** commits to raising from the following entities: €100+ million in program buy-ins from development partners (bilateral, multilateral, and foundations) in soil fertility funding for the Sahel; €100+ million from the private sector for soil fertility business models in the Sahel; and €100+ million in fertilizer sector financing for soil fertility in the Sahel.

### 5.7.4. Capacity Building, System Transformation, and Exit Plan (Years 6-10)

As mentioned above, capacity building of the national scaling partners is a major focus throughout the entire program duration. Capacity building is mainstreamed into the program and supported by capacity building plans by the capacity building and training advisor in conjunction with program technical staff, developed for reaching national program partners (CBOs, NGOs, and public sector). ***Soil Values*** anticipates that €15 million over the anticipated 10-year program period will be directed to engaging and implementing through national partners.

Capacity building will focus on the following elements: commitment and ownership of national actors to the ***Soil Values*** program and implementation of the envisaged changes; accountability and inclusion of local and national stakeholders into the process and that their voices be heard in the respective institutions; institutional strengthening and improved decision-making and management; strengthening multi-stakeholder collaboration, notably through platforms that enable the introduction and the use of innovative methodologies and practices that support ISFM; and finally, strengthening their the lobbying and advocacy capabilities of local, regional, stakeholders for policy change at local, regional and national levels.

In Years 2-3 the program will develop a System Transformation and exit plan, which will be updated at periodic intervals (Years 5, 7, and 9). As part of this plan, capacity building of national partners is a key building block, with the aim of transforming the soil system. The state of system transformation in Soil Vaues will be attained if the incentives of all actors, from farmers to national partners (public, private, CBO/NGOs) and institutions, are aligned and their capacities sustainably built around soil fertility management, so that they are able to develop their own vision, including sourcing their own resources (finance, knowledge, and networks), and implement the development path for the own future. This soil system transformation will be the landmark for Soil Values by pursuing the key issues as identified in our Theory of Change and continuously reflecting whether the required

transformations for inclusive, ecologically sustainable food production and increased resilience to climate change and shocks are in sight.

The monitoring of the impact of our contribution to the transformation of systems will be based on six levers of influence:

1. Policies, regulations, and government institutional priorities related to ***Soil Values***.
2. Practices of land management, coalitions with the private sector or civil society, and national and sub-regional networks of various rural producers.
3. Equity in the flow of financial and technical resources around value chains in crop and animal products or external inputs.
4. Quality of multi-stakeholder dialogues, shared information, and relations between system stakeholders.
5. Influence of political advocacy by organizations and/or individuals on power dynamics and the distribution of decision-making among system actors.
6. Social norms, beliefs, values, behaviors, and attitudes impacting, in particular, the inclusion of women, young people, and pastoralists.

These six levers of influence are critical elements to our exit strategy. In order to achieve the proposed systemic changes, and thus create a positive and lasting effect on the target groups, the consortium's sustainability strategy will be incorporated into the five program intervention areas. The levels of resilience and capacity to adapt to systems change will be assessed and monitored by the MELS framework. It is important that a significant change be achieved across the five program intervention areas in order to achieve sustainable systems change, thus enabling a successful exit from the program after 10 years. This shall also ensure that, by the end of the program's decade of life, results will be mainstreamed, with changed systems for long-term impact.

## 5.8. Country Implementation Plans

The geographic focus for ***Soil Values*** is the countries of Burkina Faso, Mali, Niger, and Northern Nigeria. This country selection is based on the regional political, social geographic, and climatologic coherence. Moreover, the ***Soil Values*** consortium has a track record of a wide range of past interventions in these regions and will be able to build on these lessons learned. Due to the activities implemented by the consortium in these countries, there is already a wide network of stakeholders established on the ground. An example of this is the in-country workshops that were held in June 2023: stakeholders gathered to discuss the relevance of ***Soil Values*** and how it could benefit the designated countries (see Annex 2). The Netherlands Government has also invested in the region with food security initiatives over the years, including emerging livelihoods and resilience, agribusiness and private sector development, seed sector development, and especially entrepreneurship for women and youth. The track record of the involved organizations and the investment of the Government of the Netherlands will be the foundation of the ***Soil Values*** program.

To illustrate this foundation, the consortium has curated an overview by focus country to present first insights into each country, the specific challenges and opportunities, and the initial ideas for ***Soil Values***. These country documents highlight the various elements that make each country unique. As ***Soil Values*** will work through local partners, they also showcase the wide network that has already been established across the region and the potential avenues for synergies across the four countries. ***Soil Values*** connects to what is already happening in-country and will amplify current initiatives by working with local partners, while always being on the lookout for innovations.




*Mali* *Burkina Faso*

***Figure 10.*** ***Panels developed by participants in the in-country workshops. For each panel, the left side presents the situation at the start of Soil Values: limited vegetation and crops, dry soils, and undernourished livestock. The right side shows the anticipated situation in 2033, after 10 years of Soil Values: a greener view with a diversity of crops and trees, healthy soil, happy people, and well-fed cattle, with thriving agribusinesses and improved feeder roads.***

The focus country documents are a starting point and can be seen as working documents, produced for the proposal preparation process. The inception phase of ***Soil Values*** will dive much deeper into the local dynamics and will be used to determine the approach per intervention area in each country and geographical region/zone. The inception phase will allow ***Soil Values*** to draw a comprehensive analysis of the context in each country, contextualize the ToC to that effect, and identify the next steps, with consideration for the unique set of circumstances in each country and the local partners and communities involved.

# 6. Monitoring, Evaluation, Learning and Sharing (MELS)

## 6.1. Theory of Change and MELS

The Theory of Change and the underlying intervention logic are explained in Chapter 3. In summary: Increase in soil fertility is a *sine qua non* for agricultural intensification. Three pathways need to be simultaneously implemented to lead to sustainable change in soil fertility and subsequently in food and nutrition security: (1) an agro-ecological pathway, (2) an inclusive market development pathway, and (3) an enabling environment pathway.

To reach sustainable impact and scale, ***Soil Values*** will use the principle of leverage: it will use its intervention capacity to support ongoing and future local, national, and regional projects, programs, and policies through the introduction or reinforcement of soil fertility management. Examples include the World Bank FSRP and the DGIS-funded Pro-ARIDES program. ***Soil Values*** will support the implementation of the ECOWAS Agricultural Policy (ECOWAP) for regional cohesion in soil fertility interventions, will work with national governments and institutions to enhance the effectiveness of their program implementation, and will strengthen soil fertility management in national CAADP2 compacts.

Consequently, leveraging implies that ***Soil Values*** will manage a portfolio of partnerships, which requires Monitoring and Evaluation at two levels. For **program-level** monitoring and evaluation, ***Soil Values*** will use a set of universal impact indicators and a generic or program-level theory of change. At **partnership-level** specific theories of change describe the intervention logic for each individual partnership, which are part and parcel of the strategizing and navigating processes of the partners and imply a certain degree of flexibility. The ***Soil Values*** M&E framework incorporates both levels.

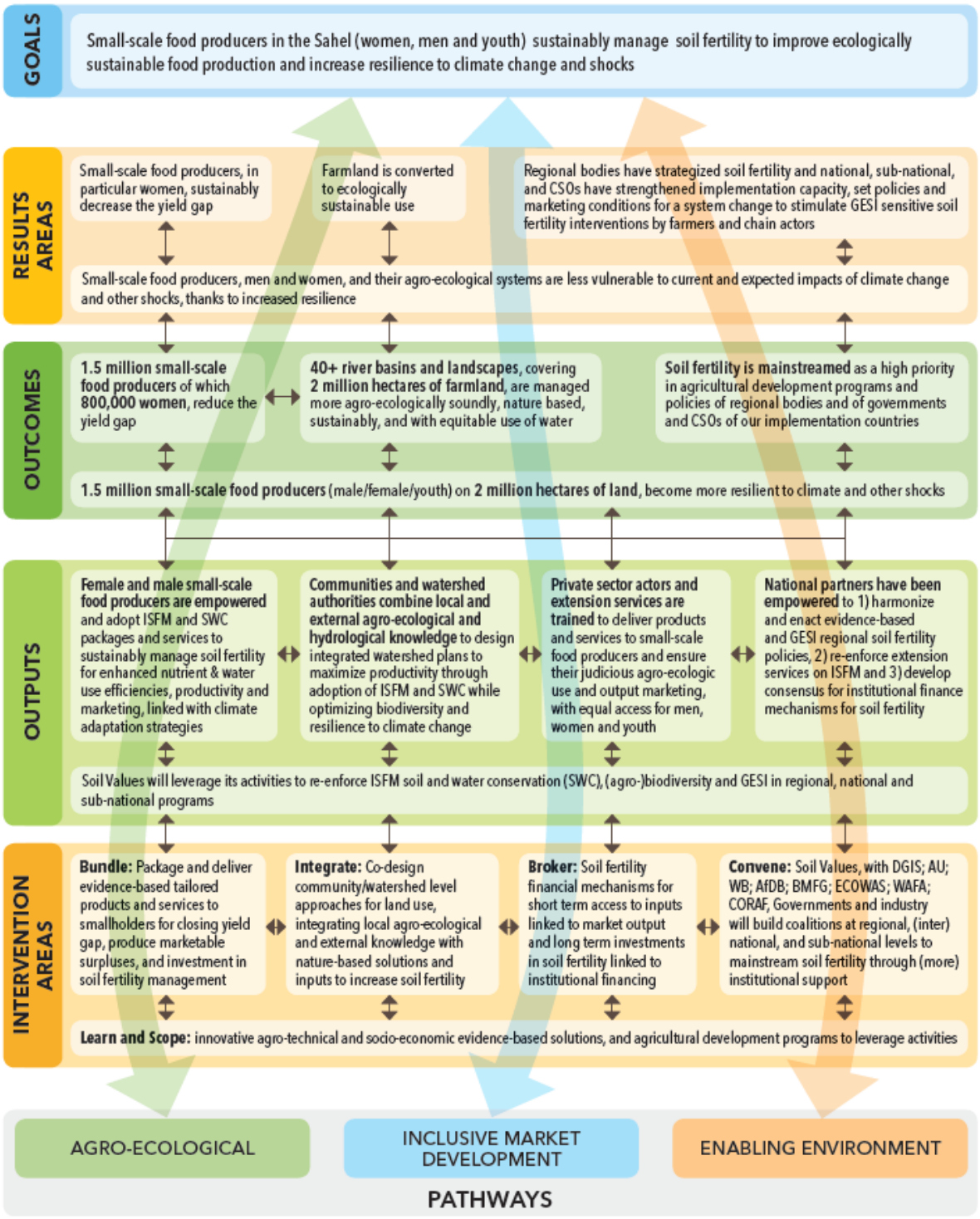



***Figure 11. Soil Values Theory of Change***

## 6.2. MELS Approach and Framework

The ***Soil Values*** MELS framework captures structural changes of our interventions and the different dynamics that take place over the years of implementation. The MELS framework will be designed to (i) track performance, (ii) track systemic change, (iii) learn from our experiences, so we can adapt our methodology and do better, and (iv) share our experiences for replication to mainstream soil fertility and to accelerate impact. We adopt approaches that facilitate continuous knowledge development, learning, action-research, and adaptation. The figure below illustrates our MELS framework.

The MELS framework aims to measure results to a level that is complex enough to be credible, yet simple enough to be practical. ***Soil Values*** will use and adapt existing digital platforms for MELS to facilitate data entry, storage, processing, and analysis/ visualization. The MELS framework aims to systematically set and monitor indicators at both program level and partnership level. These indicators show whether events are occurring, if processes are unfolding as expected, and if they result in the anticipated results, outcomes, and impact. This empowers the program and, perhaps more importantly, the partnerships, partner projects, and their facilitators to learn and adapt based on the data they collect. Accordingly, the M&E framework incorporates the following core principles:

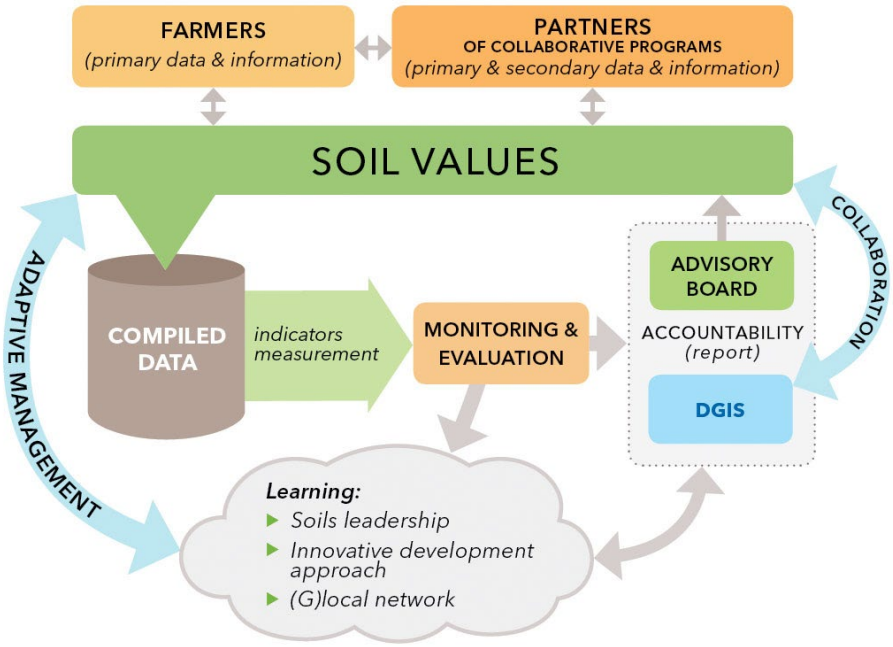



***Figure 12. MELS framework***

- ✓ ***Soil Values*** operates through existing/ongoing or future partner projects (referred to as partnerships) in the focus countries, to which ***Soil Values*** adds or reinforces soil fertility investments through the introduction of our five thematic areas.
- ✓ The use of partnership-specific theories of change and impact pathways enables partnerships to utilize results measurement for day-to-day management, particularly to validate the assumptions on which their intervention logic has been based.
- ✓ Self-reporting achievements by partnerships and the ***Soil Values*** facilitators makes it possible to measure and demonstrate results on a regular basis and to use this for learning and reflection at the level of the partnerships.
- ✓ Training of and reflection among ***Soil Values*** facilitators in the use of impact pathways for strategic management and regular reporting leads to a shared understanding of acceptable accuracy in the estimation of results, so that reported results are both credible and useful.
- ✓ Each ***Soil Values***-supported partnership is required to report on a small number of universal impact indicators in a standardized way. This enables donor and other stakeholders to assess aggregated impacts of the portfolio of ***Soil Values*** partnerships (for a country and for the entire program) on the combined development goals of food and nutrition security, environmental sustainability, climate change, and private sector development. These universal impact indicators are a subset of the indicators of the DGIS Inclusive Green Growth Department (IGG) Results Framework.
- ✓ The MELS system will ensure the collection, compilation, and storage of data from our partnerships, using software and standardized data quality protocols. After analysis, data will be used to report on the performance of the program and to adjust our intervention approach if performance is inadequate.

MELS will be guided by a Scoping and Learning Component Lead who coordinates the activities of the team of MELS experts in the focus countries. Organizing the collection data and the reporting on results in a systematic and transparent way is the core responsibility of this team. Most of the actual data collection will be delegated to the partnerships themselves through ***Soil Values*** partnership facilitators. Involving partners in monitoring the progress and direction of the envisioned change processes encourages shared responsibility for and ownership of the intended development outcomes and recognizes the contingency of such outcomes on contextual dynamics. This also allows for a lean and feasible approach for the indicators selected, which also inform the half-year reporting per partnership and country and for the entire program.

Annual reporting of progress and results will be provided to the Program Advisory Board, which primarily acts as a reviewer of the strategic choices made at partnership and program levels. This reporting requirement encourages partnerships to focus on change processes, explain how and to what extent progress has been made, and confirm that the chosen direction is still in place. The expertise of DGIS-IGG, as observer/member of the Program Advisory Board, will facilitate evaluating impact in the domains of food and nutrition security, environmental sustainability, climate change, private sector development, and inclusion of women and youth.

## 6.3. Results Framework

The detailed ***Soil Values*** Results Framework is presented in Annex 5 to:

- ✓ Translate the Theory of Change into qualitative and quantitative indicators for the overall impact, the outcomes, and the outputs of the program.
- ✓ Disaggregate, whenever possible and realistic, the indicators by country, gender, and youth.
- ✓ Provide consistent units of measurement that can be aggregated from partnership to country and program levels.
- ✓ Clarify what each indicator measures and how this contributes to outputs, outcomes, and overall impact.
- ✓ Summarize the method of measurement.

**Additional Context-Specific Quantitative and Qualitative Indicators**

The Results Framework will be further detailed during the inception phase. Building on IFDC 's experience in the 2SCALE program, a limited number of process-oriented indicators per impact pathway will be developed to enable monitoring of the three interrelated impact pathways underlying the program-level theory of change. Second, a limited number of universal impact indicators measured by all partnerships will enable reporting of the overall impact of ***Soil Values*** on the intertwined goals of food and nutrition security (SDG 2), inclusive private sector development (SDGs 1, 5, and 8), and resilience (SDG 13).

**Contribution to DGIS Food and Nutrition Security Indicator Framework 2022**

***Soil Values*** will contribute directly to the Sustainable Development Goals and the Food and Nutrition Security (FNS) objectives of the Netherlands to make food systems more productive, sustainable, and resilient in a way that contributes to the preservation of ecosystems, enhances resilience to climate change, and improves land and soil quality. More specifically, ***Soil Values*** will:

- Empower and sustainably improve productivity, incomes, and food security for 1.5 million small-scale food producers (800,000 women and 700,000 youth) through improved soil fertility and access to inputs → directly supporting the FNS objectives to *double productivity and/ or income of 8 million family farms* and to *lift 32 million people out of undernourishment.*
- Ensure the adoption of eco-efficient production practices to increase soil fertility on 2 million ha of farmland, → directly contributing to the FNS objective of *8 million ha of farmland converted to sustainable use.*
- Leverage €100 million in co-investment through public and private partner projects to improve soil fertility and introduce eco-efficient production practices → indirectly contributing to *general private sector development (PSD) indicators for aggregation.*
- Improve/broker access to financial services for 1.5 million small-scale producers to invest in soil fertility. The target total value of additional financial services equals €100 million → indirectly contributing to the *PSD objective to improve access to finance.*

Given these conditions, ***Soil Values*** will make a substantial contribution to the targets of the FNS and Water frameworks of DGIS and ultimately contribute to SDG 2 Zero Hunger, SDG 15 Life on Land, and SDG 13 Climate Action.

If ***Soil Values*** is selected by DGIS as passing the competitive stage, then we anticipate that the Theory of Change and Results Framework will be updated based on discussions with DGIS and findings from the first year of implementation.

## 6.4. MELS Activities and Timelines

During the inception phase, we will operationalize the MELS approach through the following steps:

1. Develop a Detailed Performance Plan for Monitoring, Evaluation, Learning, and Sharing for Years 1-5.
2. Refine the Results Framework in collaboration with partner projects.
3. Develop partnership-specific theories of change and impact pathways.
4. Develop MELS Infrastructure:
   - Elaborate MELS guidelines and data collection protocols
   - Elaborate the indicator reference sheets for standardized data collection.
   - Elaborate the Data Quality Assurance guidelines and (partly) automate data quality control protocols.
   - Adapt an existing IT-based platform for data storage, analysis, and visualization, accessible to all partnerships.
5. Refine risk matrix and mitigation strategies per country and per partnership.
6. Train ***Soil Values*** staff and partnership staff on use of guidelines, tools, and the MELS platform.
7. Conduct baseline studies and ex-ante contextual analysis for each target country.
8. Refine MELS timeline budgeting and resource allocation, based on experience from baseline studies.
9. Develop a Sharing and Impact communication strategy to support Convening for scale.

An indicative and simplified timeline for ***Soil Values*** MELS activities is given in Table 1. This timeline will be refined during the Inception phase into a Detailed Performance Plan for Monitoring, Evaluation, Learning and Sharing Plan for Years 1-5. The baseline studies and ex-ante contextual analysis for each target country and the partnerships that will be developed during Year 1 will provide the input to refine the MELS Performance Plan.

***Table 1. Indicative and simplified timeline for MELS for Years 1-5***

| | 2024 | 2025 | 2026 | 2027 | 2028 |
|---|---|---|---|---|---|
| Country level | Baselines studies | Monitoring of baseline data per country – aggregation among partnerships | | | Phase 1 country reports |
| | Refine risk matrix | Monitor risk and refine/adapt matrix | | | |
| Partnership level | ToC and change pathway/partnership | Annual assess assessment of drivers for change; fine-tune change pathways | | | |
| | Results framework per partnerships | Continuous monitoring and annual results reporting | | | Phase 1 partnership reports |
| Program level | Final M&E framework developed/approved | Apply MELS framework | | | Phase 1 program report |
| | Detailed final MELS Performance Plan | Monitor MELS performance / improve methodology | | | |
| | Finalize/operationalize MELS infrastructure | Apply and improve MELS infrastructure | | | |
| | Refine Results Framework | Apply and improve Results Framework | | | |
| | Refine budgeting and resource allocation | MELS budget and staff allocation monitoring | | | |
| | Develop sharing and convening strategy | Sharing, storytelling, convening | | | Phase 1 highlights |
| | Agreed Program Advisory Board role in impact assessment | Sample of partnerships for in-depth monitoring | Independent Mid-Term Review | | Refined long-term success and sustainability criteria of program |

## 6.5. Responsibilities for MELS

The performance of the ***Soil Values*** program, which in essence consists of managing a portfolio of partnerships and context-specific change processes to increase soil fertility, will be monitored and evaluated at two levels. This implies that the MELS responsibilities are situated at two levels.

- At **partnership level**, specific theories of change describe the intervention logic for each individual partnership, which are part and parcel of strategizing and navigating the processes of partners and imply a certain degree of flexibility. The ***Soil Values*** facilitators will support these programs to ensure that the partnership-specific performance indicators of these programs are aligned with the ***Soil Values*** MELS framework.
- **Program-level** monitoring and evaluation is based on universal impact indicators and a generic or program-level theory of change describing the three pathways through which ***Soil Values*** aims to incubate and accelerate inclusive business.

Table 2 presents the responsibilities for implement the MELS framework at partnership and program levels.

***Table 2. Responsibilities to implement the Soil Values M&E framework at partnership and program levels***

| | Partnership Level | Program Level |
|---|---|---|
| 1. Articulate the results chain. | Agree on a flexible Theory of Change and identify ways to monitor progress and direction; this is a requirement for each partnership supported by ***Soil Values***. | Three impact pathways describe how ***Soil Values*** evolves, how scaling works and accelerates impact, and how the program transforms policies. |
| 2. Define indicators of change and other information needs. | Identify partnership-specific indicators for immediate and intermediate outcomes of each impact pathway. | Operationalize the process indicators per impact pathway to capture progress from ***Soil Values*** interventions. |
| | Apply universal impact indicators that measure the overall impact of ***Soil Values*** on the intertwined goals of food and nutrition security (SDG 2), inclusive private sector development (SDGs 1, 5, 8), resilient rural communities (SDG 13), and partnerships that work effectively for sustainable development (SDG 17). | |
| 3. Measure attributable change. | Monitor impact indicators and tracing processes. | Monitor process indicators and assess progress and direction of program-level impact pathways. |
| | Set target values for the partnership's contribution to the universal impact indicators. | Monitor intermediate outcomes to assess potential partnerships and development additionality of the entire partnership portfolio. |
| | Measure goals (reach) of target beneficiaries by partnership's activities. | Aggregate reach and assess goals based on universal impact indicators. |
| 4. Capture wider changes in watersheds/landscapes. | Document influence of risks and tensions and enablers and barriers on impact pathways. | Document trends in sectors and identify policy directions for these sectors and industries. |
| 5. Track costs and impact. | Track input additionality at partnership level. | Report resources allocated to specific areas and sector (IATI protocol). |
| 6. Report costs and results. | Measure efficiency by reporting amount per target beneficiary reached or area covered. | Aggregate cost-effectiveness and compare this with to be defined benchmarks. |
| 7. Manage the system for results measurement. | Partnership facilitators are supported by MELS staff to annually monitor the quality of measurement and reporting of sample of partnerships. | MELS staff manages information system; the Program Management Team monitors quality of reporting at partnership and program levels. |

## 6.6. Data Management

All collected data will undergo automated quality control (and, if necessary, manual data cleaning). Data assets from this program will be accessible and open, including publications and the datasets they are built on. Data will be made Open and Findable, Accessible, Interoperable, and Reusable (FAIR), with personally identifiable information appropriately handled, no later than 12 months after collection or 6 months after publication of the information associated with the data, aligned with the EU's Open Science requirements. Data and information generated by the program will be shared with partners and others under CC-BY licenses by default. However, if target countries have data governance and sharing policies, the program expects negotiation to balance host-country sensitivities with the need for open and FAIR data. Such concerns may require modifications to this practice (with appropriate justification), but in general, data sharing agreements negotiated at program inception with national partners will ensure open, FAIR, and ethical data assets (including data, as well as other funded knowledge and information) to the fullest extent possible. Much of the groundwork for these agreements is already in place through CGIAR activities and can be rapidly customized for this program as needed.

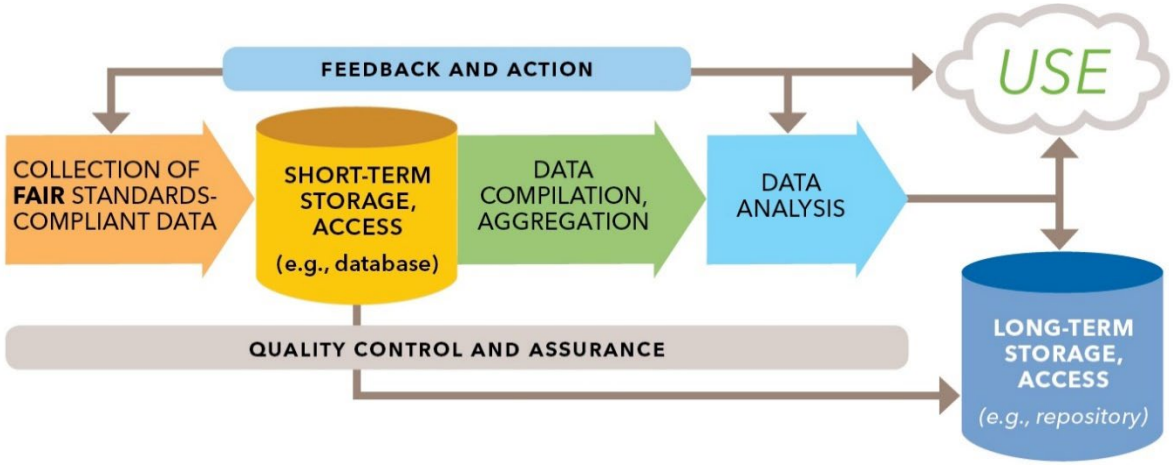



***Figure 13. Data management, data integrity, and quality assurance***

### 6.6.1. Learning Agenda

During the inception phase of the program, a learning framework will be developed that identifies learning questions, learning objectives, expected outcomes, responsibilities, and timelines. The learning framework houses the structure, plan, processes, and activities by which learning will be routinely captured and applied, resulting in improved understanding of program effects, successes, and failures. It will be developed based on learning objectives, i.e., the purposes of the learning, the scope of the learning in reference to the ToC, specific learning questions and deliverables, and responsibilities for learning.

The function of knowledge management in ***Soil Values*** is to improve practice. It involves critical reflection (based on MEL evidence and lessons learned), directing changes in implementation, contributing to periodic evaluation of results and effects, and providing wider evidence on what works and what does not. A range of knowledge products will be developed and adapted to the needs of stakeholders, translated into local languages, French, and English where needed. Use of knowledge will be tracked across the lifecycle of the ***Soil Values*** program, including its adoption by other projects and actors in the Sahel zone.

***Soil Values*** intends to leverage impact through it partners and to mainstream soil fertility and will collaborate with these partners to build ownership and to make soil fertility an integral initiative over the learning agendas of the ECOWAS Agricultural Policy, the World Bank FSRP initiative, the CAADP2 country plans, and the national action plans for Fertilizer and Soil Health that will arise from the Africa Fertilizer and Soil Health Summit. From the onset, these partners will be involved in the identification of their learning needs to increase the likelihood that the ***Soil Values*** MELS data and information will be used to shape a joint learning agenda needed to mainstream soil fertility in ongoing and future national and regional initiatives. To expand the learning agenda beyond these specific programs, our Convening (see Section 5.5) will actively collaborate with FARA and the

FARA/AU Soil Initiative for Africa, to build on lessons learnt from Soil values to strengthen the soil fertility as integral component of national education and extension systems.

**Learning Agenda**

The learning agenda of Soil Values aims at enriching the program and the context in which we operate with knowledge and people. We do this by:

- Reflective learning from the collective experience in the region and adapt strategies accordingly.
- Signaling relevant trends, events, and break throughs in the region and to share, reflect and learn from them with our partners and the program itself.
- Building a future cadre of excellence. To this end we will train people at the MSc and PhD level. WUR will collaborate with universities in the region to create sandwich PhDs and strengthening masters' programs [focusing on integrated and systems thinking]. The persons selected for these scholarships will be part-time employed by the program to ensure that their newly acquired wisdom can be used on the program.

At the end of the program, there will be a significant number of staff that will be ready to serve in ongoing and other technical and policy-related functions in the region, contributing to sustainability and impact.

## 6.7. Risk Monitoring and Adaptive Management

**Conflict Sensitivity and Do No Harm.** Within the current context of insecurity in the Sahel, the ***Soil Values*** program favors conflict-sensitive program management. This involves monitoring conflict at local, national, and regional levels and acquiring a good understanding of the interaction between ***Soil Values*** activities and the context in which the program operates. The objective is to reduce risk for program staff, and ***Soil Values*** will ensure that its own actions do not generate conflict (Do No Harm principle). To achieve this, the program will support tools to ensure that selection processes are inclusive and conflict-sensitive and promote conflict-sensitive communication (internally and externally) and capacity-building actions for national partners and other program stakeholders in terms of conflict sensitivity and community accountability.

**Adaptive Management**. The fragile and unstable environment, illustrated by the withdrawal of UN security forces in Mali, the recent coup d'état in Niger, and the possible ECOWAS military interventions to restore democracy in Niger, is likely to affect ***Soil Values*** programming. DGIS-IGG and the Netherlands Embassies in the ***Soil Values*** target countries are clearly responsible for the decision to continue investments in ***Soil Values*** and related interventions. However, this proposal is developed in the assumption that the choice of overall geographical zones of intervention will not be modified during its implementation, but target communes, implementing partners, the relative weight and timing of the different outcome areas may be reviewed, in response to a change in the context or to new information from studies, analyses, or action research questions. To ensure that the intervention remains effective, program management will be organized in such a way as to be able to adapt to changes in the context, suggesting that annual or quarterly work planning will include reallocation of activities and budgets to adapt to changing conflict and security situations.

This requires a high degree of flexibility and adaptability from all members and implementing partners within the consortium. It also requires the creation of an environment that fosters learning, enables flexible design of activities, ensures the safety of staff and stakeholders, facilitates access to impact groups, and minimizes barriers to consortium reach through intentional planning adjustments throughout the program cycle.

To this end, the following measures will be considered:

- Conduct regular analyses of local social contexts: As part of the inception phase and subsequently on a half-yearly basis, ***Soil Values*** will contribute to a review of the conflict situation, accessibility to target communes, the operations of implementing partners, and hypotheses of change and their interactions. Within this context, we will also monitor conflict events through these partners and other third parties.
- Updating the Theory of Change: Based on these analyses, ***Soil Values*** will organize a biannual review of diagnoses (conflict, accessibility to target communes, program operations of all implementing partners), updating of hypotheses and prioritization of different outcomes at the level of each geographical intervention zone.

- If necessary, adapt resource allocation: The Program Advisory Board, in its biannual meetings (see Chapter 7 Consortium Roles and Program Governance), will monitor programmatic performance in the context of conflict, analyze any deviations encountered, and assess the level of budget execution. If necessary, the Program Advisory Board will advise on adjustment in the implementation approach in terms of activities, staffing, and budget and adapt the management to guarantee performance under changing conflict conditions. DGIS-IGG is member of the Program Advisory Board and, as such, will be involved in discussions and decision-making about adjustment of activities and budget allocations.

**Organizational flexibility measures**. The following measures will facilitate adaptive management:

- Integrate monitoring and learning issues: Evaluation and learning issues are an integral part of adaptive management. The contribution of program staff assigned to monitoring the program and hypotheses of change, requiring the production of evidence, will therefore feed closely into the adaptive management of program planning. More generally, a learning culture requires a greater capacity for risk-taking, which in turn means investing more time in knowledge production.
- Integrate socio-cultural diversity: Staff and implementing partners who are representative of the socio-cultural diversity of the intervention area will be recruited, on the premise that those who know the context best are best able to adapt to its evolution. Such an approach implies ensuring the neutrality of program staff and partners and that they are not put at risk.
- Diversifying accessibility strategies: The program will adopt strategies to facilitate access to its target communities and groups. The first will be an acceptance strategy, aimed at obtaining the prior consent of stakeholders and target groups for the program to support them. The second will be a strategy for the rapid redeployment of activities based on security analysis data and/or the establishment of subsidiarity mechanisms for medium- or longer-term decision-making, which can facilitate the implementation of priority activities by stakeholders who still have access to the target communes (local relays and operators, endogenous resource persons).

# 7. Consortium Roles and Program Governance

The ***Soil Values*** program management approach builds on best practices and lessons learned from other DGIS-funded multi-country, multi-phase programs, including 2SCALE and Pro-ARIDES. It also builds on the consortium's combined 200+ years of implementation of agricultural and market development projects and programs.

Fundamental to our program management approach is a one-program, one-team approach, adaptive management and related conflict-sensitivity which are incorporated as a guiding principle into the program design, management and operations, in addition to the fundamental principles which underpin the entire program.

## 7.1. Overview of Partner Roles

***Soil Values*** has organized a team with expertise and the necessary technical experience across all of the required intervention areas. As part of the one-team approach, each intervention area is led by a consortium partner and supported by knowledge partners, while relying heavily on national partners for implementation.

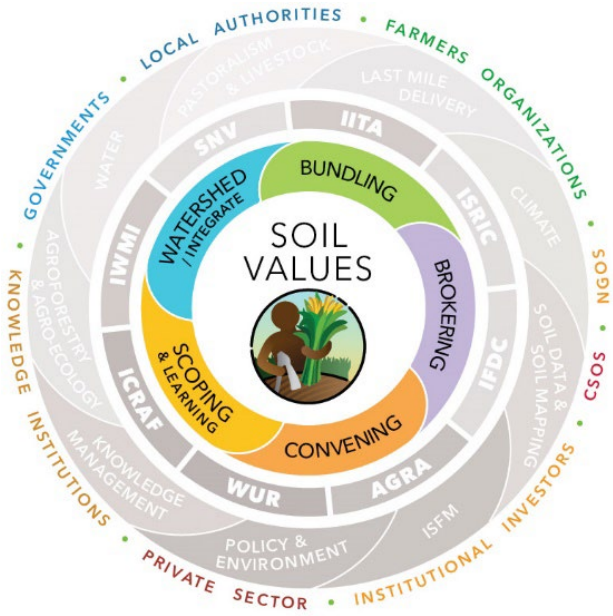



***Figure 14. Soil Values with farmers at heart, the intervention areas and national partners***

The national partners are key in the ***Soil Values*** approach, as they literally embed the ***Soil Values*** program into the four focus countries. This national ownership and embeddedness is a fundamental principle of the program. The national partners ensure the relevance of ***Soil Values*** activities in each country and bring their experience on board to make interventions more effective. This allows ***Soil Values*** to become embedded in local knowledge, streamlining implementation, simplifying scaling, and enhancing long-term sustainability. The partners in each country cover a wide range of stakeholders, such as knowledge institutions, the private sector, institutional investors, CSOs, NGOs, farmer organizations, local authorities, and governments. An illustrative list of national partners is included in each of the focus country profiles (see Annex 3).

The above-mentioned elements are all united, as seen in the adjacent figure, which emphasizes the farmers at the heart of ***Soil Values***, the intervention areas as vehicle to break down the ultimate goal of ***Soil Values***, and the national partners as the owners of program interventions and a bridge to the in-country activities and ongoing programs. The round shape represents the rather dynamic character of ***Soil Values***; it is a program that is always evolving due to the adaptive management embedded at its core.

## 7.2. Complementary Areas of Expertise

As ***Soil Values*** is continuously evolving, building on its lessons learned, it requires a dynamic coalition of organizations that can complement each other seamlessly. The coalition members each bring decades of experience of inclusive processes with local, national, and regional actors to *learn, co-design, and adapt* local agroecological practices to include external inputs for sustainable implementation of evidence-based Integrated Soil Fertility Management (ISFM) practices. ***Soil Values*** has three types of partners that work closely together with the national partners for implementation:

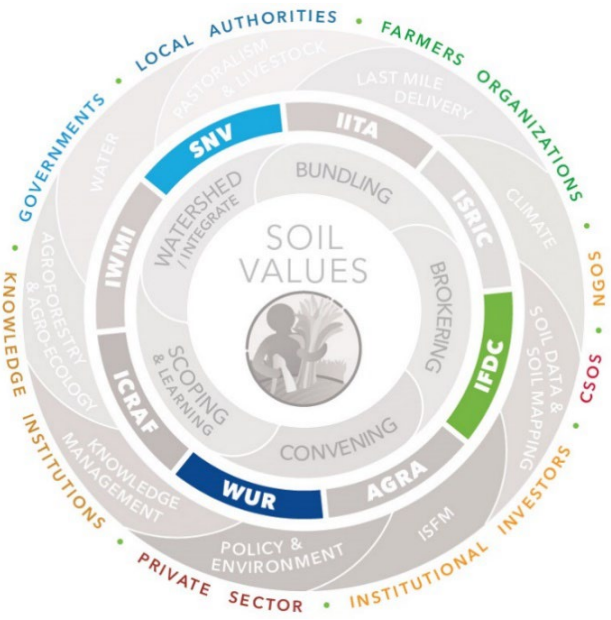



***Figure 15. Soil Values consortium partners***

1. **Consortium partners**: The three consortium partners (IFDC, SNV, WUR) are directly involved with the implementation of the program. IFDC and SNV will lead intervention areas on bundling, integration, and brokering, as well as the related in-country partner management and activities in the focus countries. WUR will lead the learning and scoping agenda and education activities based in the Netherlands; in-country activities for scoping and learning will be coordinated by IFDC.
2. **Convening partner**: AGRA, as the recognized leader in convening on the continent through its annual Africa Food Systems Forum (formerly AGRF) and other fora, is the ***Soil Values*** convening partner and will be leading the efforts to create consensus around the soil fertility agenda.

3. **Knowledge partners**: The four knowledge partners (ICRAF, IITA, ISRIC, and IWMI) are global leaders in their respective fields of expertise and will engage to set strategies:

   - **ICRAF** specializes in the agro-ecologically effective utilization of trees in agroforestry systems and in landscape design to enhance their overall resilience. Their agro-ecological insights will be key in the co-design processes for development and implementation of watershed/landscape plans.
   - **IITA** has decades of expertise on agronomic practices and farm-level interventions, with thorough knowledge of ISFM practices and associated implications of soil and climatic factors. They will assist with the bundling of ISFM and SWC with other good agricultural practices and services.

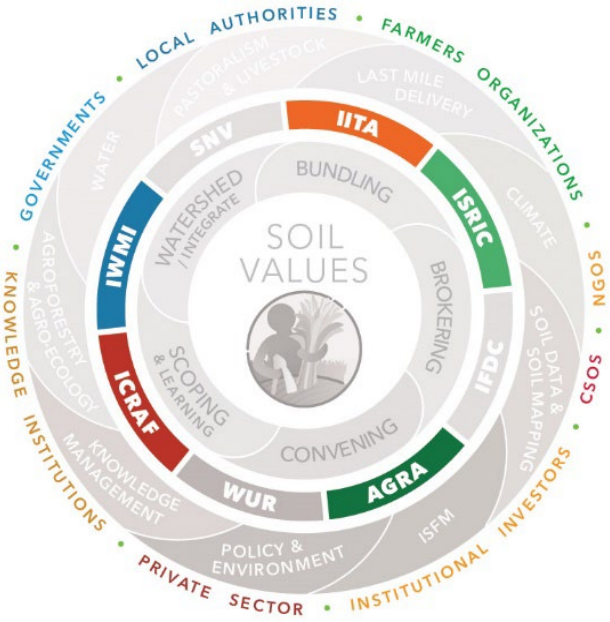



***Figure 13. Soil Values knowledge partners***

   - **ISRIC**, as the custodian of global soil data, is deeply specialized in soil data collection, harmonization, quality control, and use in soil mapping. Along with their experience in training and education, the organization can assist in strategizing about capacitating local professionals in the development of nationally owned soil data systems.
   - **IWMI** has expertise in quantitative water analyses and participatory approaches to co-design innovative water management solutions with local actors for sustainable development at farm and watershed levels. Its insights will be key to strategizing about participatory watershed/landscape planning and implementation for optimal utilization of water and land.

As part of a one-team approach, each intervention area is led by a consortium partner and supported by knowledge partners, while the interventions themselves are owned and embedded with national partners. Consortium members will take leadership of and staff each of the five program intervention areas, with the responsibility for delivery and execution. The figure below illustrates each intervention area, its lead, and supporting organizations. The lead organizations are marked in the same color as the designated intervention area.

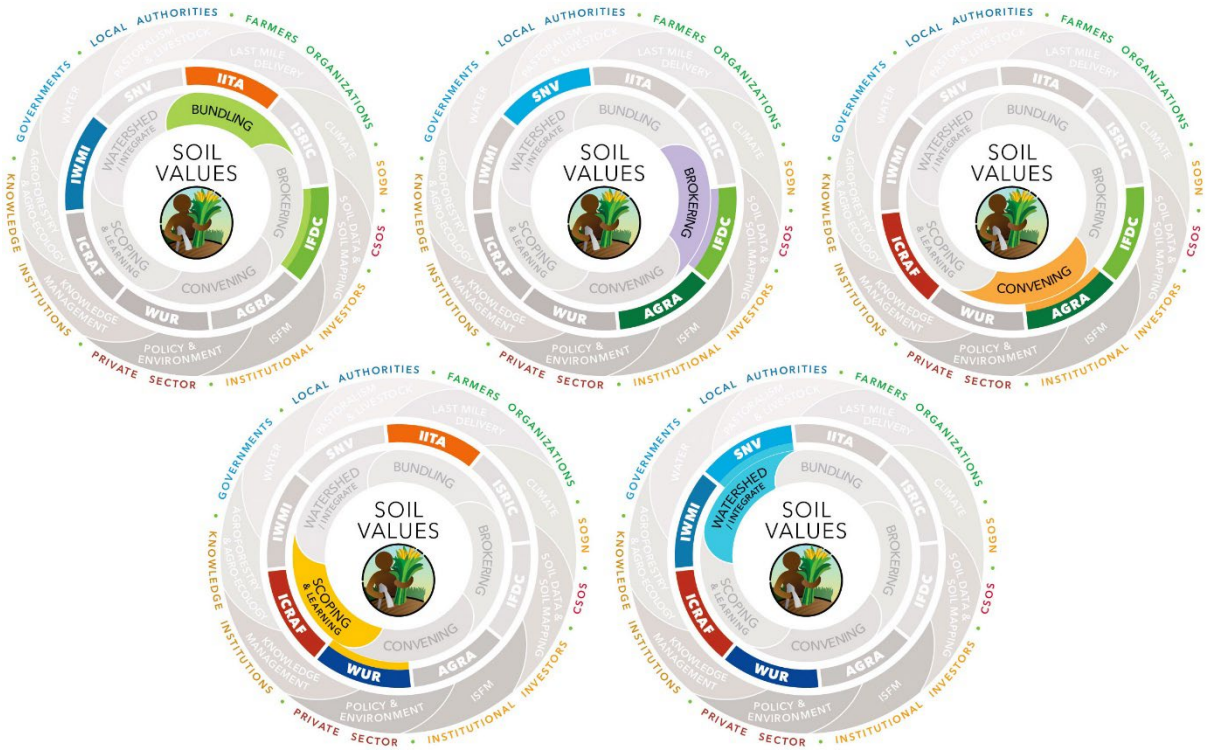



***Figure 16. Intervention areas, lead and supporting members***

Aside from the five intervention areas, ***Soil Values*** unites the consortium members' knowledge and technical expertise within the program. These nine areas of expertise – represented in the outermost shaded ring in the figure below – will play a major role in the implementation activities of ***Soil Values***. The thought leadership and strategic direction of each of the key technical areas of the program have been assigned to one program partner based on their institutional mandate and supported by up to three other technical partners, as shown in the table below. A key principle behind this allocation of roles is to allow consortium and knowledge partners to focus on a limited set of core competencies to manage/lead and support, while drawing on the strength and diversity of expertise within the consortium.

The overlap in technical expertise, areas of geographic operation, and partners and networks provides a basis broad enough to cover the regional diversity, partner diversity, and technical diversity in approaches. It leaves **no blind spots**. By having each technical area led by one entity, with up to three more supporting entities, we also **avoid the tunnel vision** that may result if the technical area was assigned to only one entity. The cooperation will lead to robust discussions and vetting of approaches. The breadth and depth of the partners also ensures that sufficient capacity is available for rapid scale-up and to respond to changing conditions (adaptive management).

All the technical areas are connected during the work on soil fertility, hence the circular and dynamic representation of the technical areas. Each technical area must work hand in hand with the others to be most effective. So even though SNV might lead pastoralism and livestock, it will not be working in a silo; instead, SNV will collaborate closely with other partners, such as WUR to exchange knowledge management practices and ICRAF to include agro-ecological practices while working with

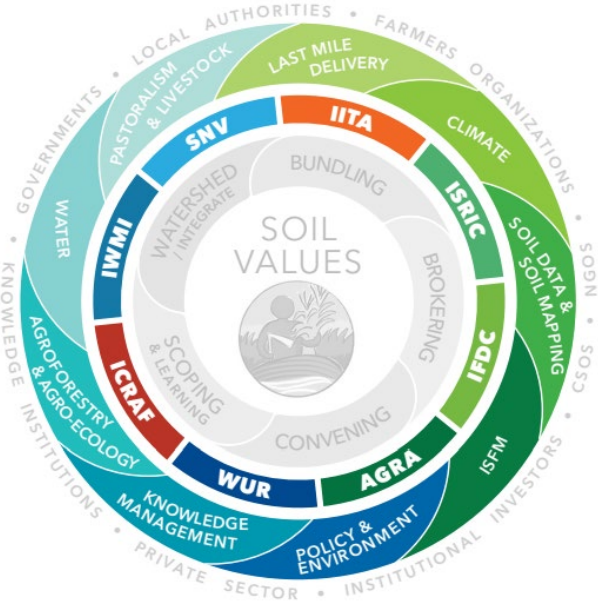



***Figure 17. Soil Values and its technical expertise***

pastoralists. Aside from the collaboration within the consortium, the expertise will be complemented by the national programs in which country activities are embedded. The combination of technical support with in-country expertise will make interventions sensitive to the nuances in the various communities and conflict settings. Finally, the technical areas are constantly building on the lessons learned within the program, making it easier to apply adaptive management.

| Technical Areas | Lead | Support |
|---|---|---|
| Soil data and soil mapping | ISRIC | IFDC, IITA, ICRAF |
| ISFM | IFDC | IITA, WUR, ICRAF |
| Policy and enabling environment | AGRA | IFDC |
| Knowledge management and communication | IFDC | IITA, AGRA |
| Agroforestry, agro-ecology | ICRAF | WUR |
| Water | IWMI | SNV, WUR |
| Pastoralism, livestock | SNV | WUR, ICRAF |
| Last-mile delivery | AGRA | IFDC, SNV |
| Climate | IITA | WUR, ICRAF, IWMI |

The ***Soil Values*** approach is characterized by the small-scale food producer at the heart of the intervention areas to break down the program's ambitious goal into workable solutions, while always building on existing initiatives in-country. Each of the partners contributes to its intervention area in its own unique way applying its technical expertise and experience. ***Soil Values*** would be nowhere without its national partners that embed the program into the context of the various focus countries and contribute to an increase in healthy soils in the Sahel. The illustration to the right showcases the dynamic and ever-evolving approach that ***Soil Values*** proposes for the 10-year duration of the program.

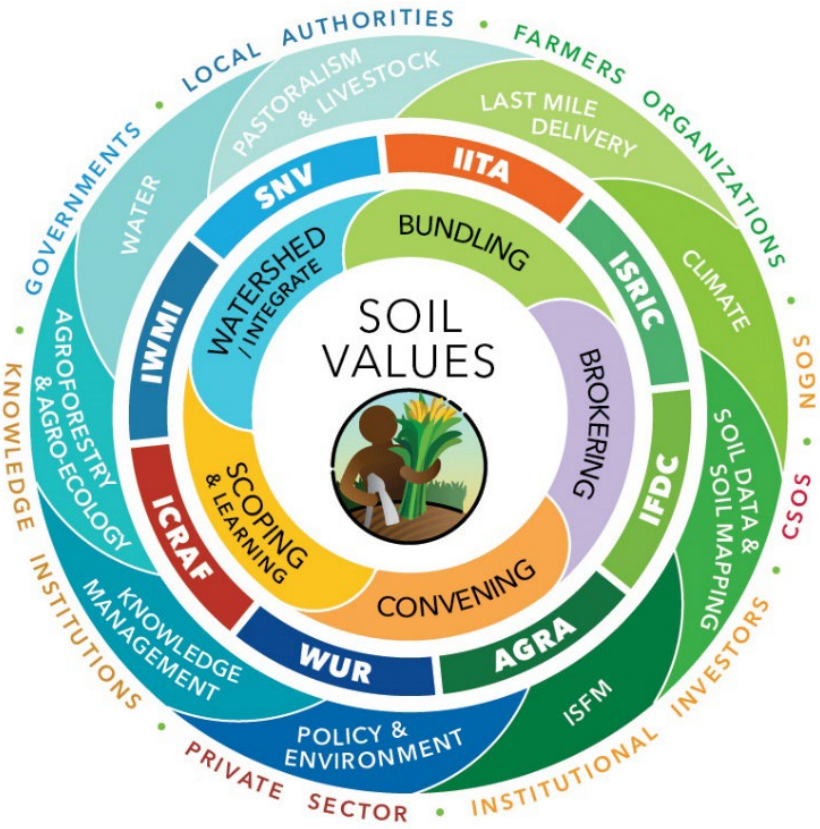



***Figure 18. Dynamic Soil Values approach***

## 7.3. Consortium-Level Governance

The approach to consortium management and governance is presented in the figure below. This structure is aligned with the SFGP Partnership Agreement for West Africa, signed by IFDC, SNV, and WUR in March 2023. It will be updated at the start of implementation to reflect any changes required after submission of the proposal, discussions with the consortium partners, and recommendations by DGIS.

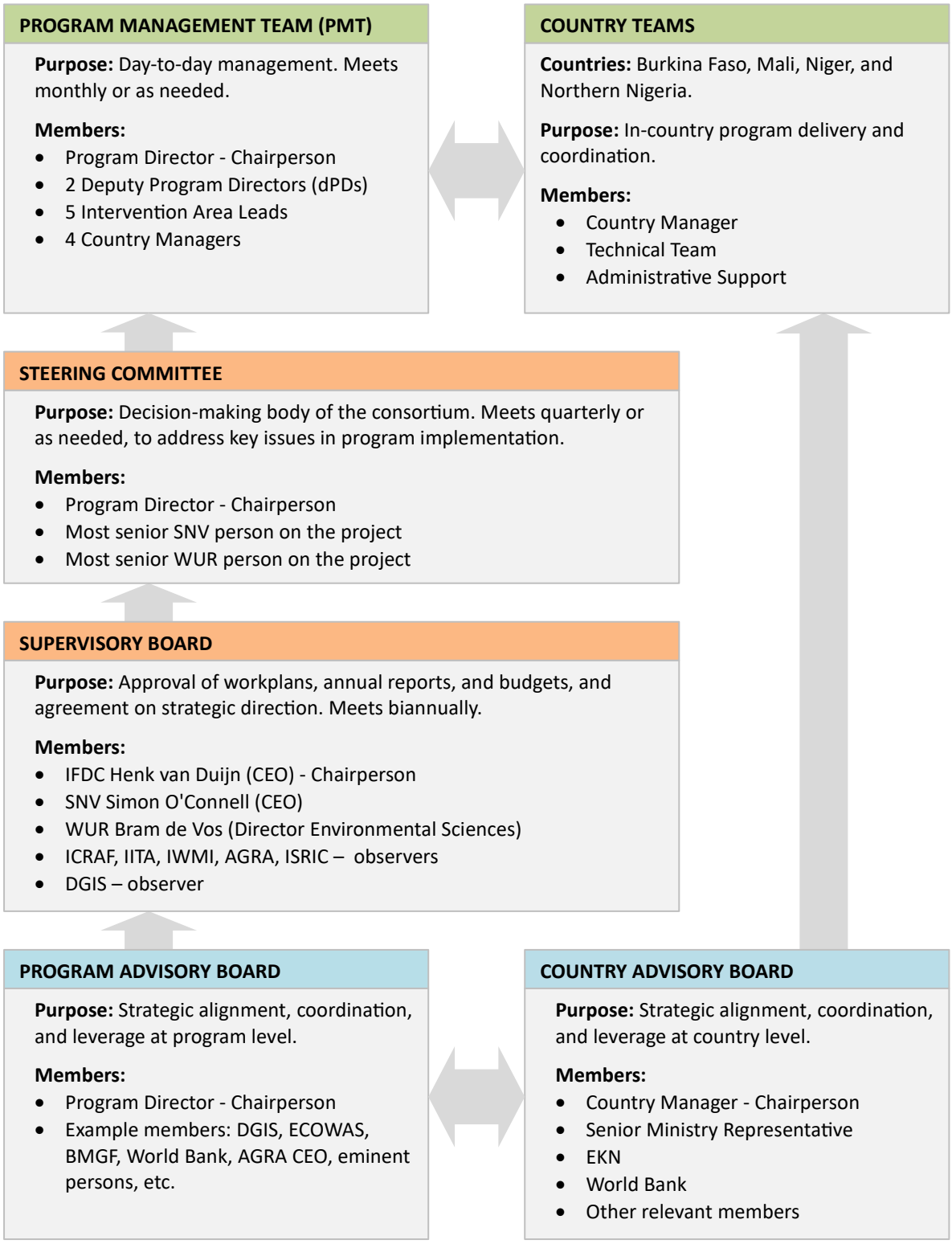



***Figure 19. Consortium governance***

Country teams are managed by a Program Management Team (PMT) responsible for day-to-day management. The PMT is led by the Program Director and comprises senior staff, including the Deputy Program Directors (dPDs), intervention leads, and Country Managers. The PMT reports to the Steering Committee, which is the decision-making body of the consortium for matters of day-to-day program management, composed of the senior-most program staff member of each of the three consortium partners who will address key issues in program implementation. The Steering Committee in turn reports to the Supervisory Board which meets biannually for approval of workplans, annual reports, budgets, and overall strategic direction. As ***Soil Values*** will leverage major global funding streams that address soil fertility and agricultural development in the Sahel, the Supervisory Board will comprise the CEOs of IFDC and SNV and the WUR Director Environmental Sciences. DGIS and coalition partners will be invited as observers.

The contractual, technical, and financial obligations of the consortium, led by IFDC, will be reviewed, progress discussed, and adjustments made at the level commensurate with the level of the governance body. As the lead partner, IFDC has the responsibility for requesting, compiling, and validating program information from consortium partners and stakeholders in fulfillment of its contractual obligations to DGIS. Decisions will be made by consensus and, if not achieved, by majority vote, as outlined in the SFGP Partnership Agreement for West Africa, to be updated as noted above. Technical and financial reports, including annual workplans and liquidity forecasts, will be submitted by the agreed-upon deadlines and in the agreed-upon format, including for IATI publication.

Finally, to ensure that ***Soil Values*** leverage and aligns with national governments, key stakeholders, and other complementary initiatives and funding assistance, two Advisory Boards are foreseen – one at program level and one at country level, established in consultation with DGIS. These Advisory Boards will ensure that ***Soil Values*** is fully aligned strategically with governments and stakeholders at national, regional, and global levels, while ensuring that their perspectives and voice are included in the program. The former will be composed of key individuals and stakeholders from DGIS and bilateral, multilateral, and development partners relevant to ***Soil Values***; the latter will similarly be comprised of representatives from EKNs and key individuals at country level, including host government institutions.

# 8. Program Management Approach

To enable smooth program operations, all country offices will be hosted by IFDC, allowing for one-team institutional and operational delivery. This prevents having different operational modalities within the program and allows consortium partners to focus on technical delivery. Hosted partner staff will have employment contracts and terms from their respective employers.

The one-team approach is reinforced through joint work planning of program activities by the entire team (consortium and local partner organizations).

**Adaptive Management**

Adaptive management is embedded in the ***Soil Values*** partnership agreement and governance model and cascades down through to program design, implementation, and operations, allowing for changes at each of these levels, to respond to evolving conditions, priorities, and needs. Changes to the partnership at consortium level will be undertaken in consultation with DGIS.

Adaptive management in program delivery and operations allows for rapid response to changing conditions (including conflict) and changing contextual priorities. Contractually, consortium partners are allocated a contract ceiling level of effort and corresponding budget allocation for the program duration, driven by a detailed annual work planning process, which drives activities and resource allocation within the program. Program partners and the PMT will undertake monthly monitoring of activities and spending to ensure progress is made in implementation and results, while addressing bottlenecks and making corrections. Mid-year, resources will be reallocated from within the annual DGIS budget allocation to support areas that require intensification or emerging priorities, while remaining part of the consortium partner's overall budget envelope for the program. Every few years, the program budget will be realigned based on the changing context and priorities and on

partner spending during the previous period. This approach to adaptive management allows for sharing of risks and costs within the consortium to maximize cost-effective implementation.

**Multi-Country Management**

Program staff will be spread throughout the four country offices to ensure balance and maximize cross-learnings and interactions. Country Managers will report to the dPD-Technical and oversee a team of technical staff in country that also have dual reporting to the intervention area leads. This matrixed one-team structure prevents the development of programmatic or geographic siloes, ensuring communication and learning throughout the program, further strengthened by the technical assistance team that provides support across the entire program. Staff will be responsible for delivering specific results, ensuring accountability within the matrixed structure.

## 8.1. Operating in a Conflict Setting

The ***Soil Values*** conflict-sensitive approach and do-no-harm principles, outlined above, are particularly relevant due to the conflict setting. Likewise, working in the program area is a security challenge, and members of the ***Soil Values*** consortium have been operating in these regions for decades. Critical to operations under these circumstances is to be well-informed and to have strict operational protocols. Security assessments and protocols will be established at the start of the program for each country and for the program overall (based on existing IFDC and SNV security protocols) to define minimum standards and safety and security measures common to the consortium. On an ongoing basis, daily security monitoring will be undertaken by the ***Soil Values*** Security Officer in conjunction with IFDC's security team, which is well networked with security teams of our consortium partners, and in-country and regional security structures. This will ensure that all staff are well-informed about the conditions they must work under and safety measures to be taken. Staff will receive conflict sensitivity and security training at the start of their employment and regular refresher trainings. Visiting staff, consultants, and stakeholders will also be given security briefings at the start of their engagement.

The program is adapted to work under these circumstances. ***Soil Values*** will work through local organizations and their existing programs and with their existing target groups, which are part of the conflict setting. Consortium teams, partners, and stakeholders will be required to adhere to the standards defined by the consortium. In addition, when assessing specific risks in the geographical areas under consideration, consortium members will draw upon the knowledge of partners in the areas of intervention. Field activities by ***Soil Values*** and partner staff will strictly follow consortium security protocols, with no activities taking place in high-risk areas, as defined in the next section.

## 8.2. Program Leadership and Staffing

Program staff will be composed of the implementation team (technical experts), operational team (support functions), and technical assistance team (specialized subject-matter experts), as shown in the organigram below. The implementation and operational teams will be full-time dedicated staff, hosted in one common program office in each of the focus countries.

The Program Director for ***Soil Values*** will be a respected agricultural development leader, with the required regional and global networks, relationships, and technical and management skills to manage a program of this size and complexity. The Program Director will be supported by two deputy Program Directors (dPDs), one each for the technical and operational functions of ***Soil Values***. The dPDs will have the required technical and operational skills for a program of this scope and size and to coordinate within and across their respective teams. MELS as well as communication and knowledge management are placed with the operational team to ensure segregation from the implementation team. The operational staff will all be IFDC staff to ensure institutional alignment and uniformity in operations and reporting.

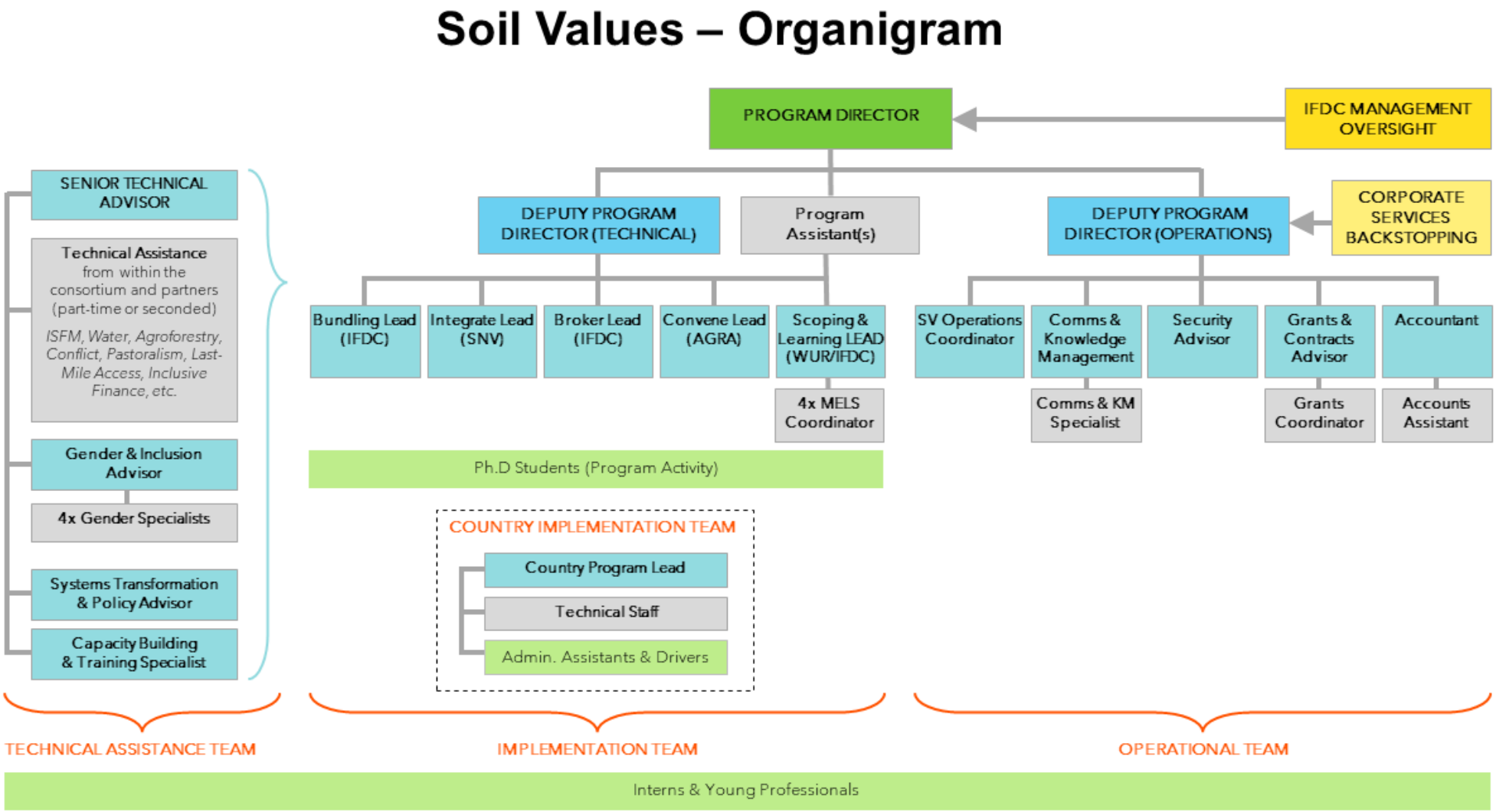



***Figure 20. Organigram***

The dPD-Technical will oversee and integrate the work of the five intervention area leads, each staffed by the respective consortium partner responsible for its delivery. The exceptions to this are "Convening," which will be staffed by AGRA, and "Scoping and Learning," which will be led by IFDC in the program region with backstopping by WUR (remotely).

The technical assistance pool will be comprised of a combination of dedicated staff in the program offices for key technical areas (e.g., ISFM, GESI) as well as resource persons with a flexible level of effort for specialized technical input drawn from within the consortium (e.g., agroforestry, soil data), which may be remote or based in the program region. This technical assistance model allows for rapid and cost-effective delivery of specific technical assistance on an as-needed basis to respond to localized contexts and evolving program priorities. Gender equity in staffing will be given priority and a balance ensured in both program leadership and the program team.

Staff will be spread throughout the four country offices, with no dedicated program head office. The Program Director will be based in one of the four program offices, with frequent travel to the focus countries. Staff will be recruited nationally (with the possible exception of one or two of the most senior staff) and based in the country of their origin or current location, ensuring equitable distribution throughout the program offices. Certain priority functions (e.g., MELS and GESI), as well as administration/finance staff will be based in each of the country offices.

In-country leadership will be provided by Country Managers who will coordinate activities of the in-country team and serve as primary liaison in country matters, and lead Country Advisory Board meetings. Country offices will be staffed by the technical staff located in each country overseeing specific areas of program implementation involving combinations of coalition and national partners.

## 8.3. Risk Management

Continuous risk and opportunity monitoring, and adjustment of our risk mitigation strategy will be a critical part of the ***Soil Values*** adaptive management approach. ***Soil Values*** will work in four countries, each with different risk and opportunity profiles. As the program will last for 10 years, the risk assessments linked to adaptive management will be an ongoing exercise due to the adaptive management approach, and the ***Soil Values*** consortium will continuously monitor the activity areas. The consortium developed an initial risk analysis (see Annex 9) and we will expand on this analysis during the inception phase.

The risks will be identified, analyzed, and evaluated on various levels: (1) contextual, (2) programmatic, (3) Institutional risk. The three pillars of the risk analysis will not only be done at a country level but also specified toward the specific activity areas, the watersheds and communities that ***Soil Values*** will work with. Moreover, the local partners in-country will be a crucial part in the risk assessment, as ***Soil Values*** will connect to already ongoing programs. Therefore, the risk assessment of the ***Soil Values*** consortium will merge with the risk analysis of local partners to create the most comprehensive and effective risk strategy. DGIS will also be engaged and updated throughout the duration of the program about unfolding situations and adaptive management decisions.

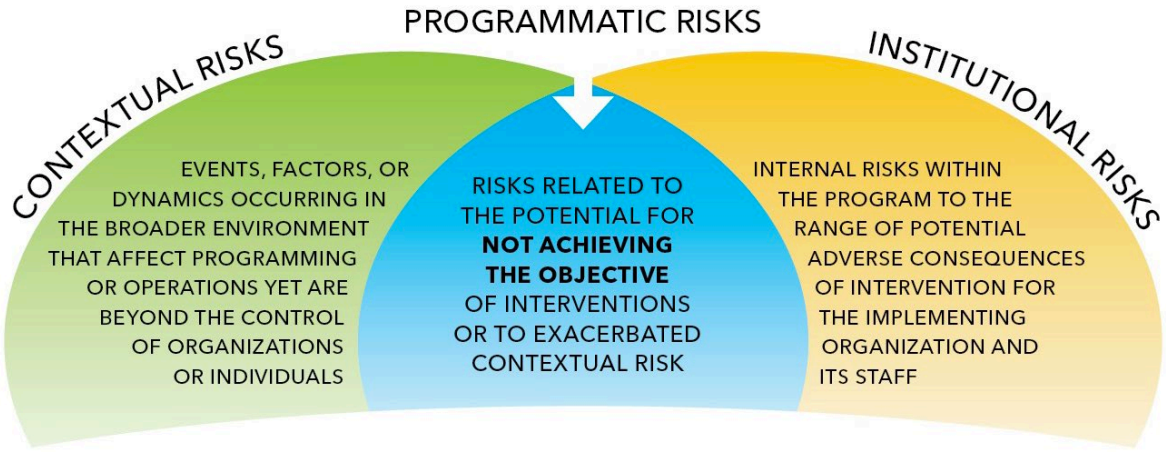



***Figure 21. Description of contextual, programmatic, and institutional risks***

In terms of contextual risk, Burkina Faso, Mali, Niger, and Northern Nigeria, as Sahelian countries, share common risks and challenges. These countries face severe land degradation resulting from climate change and variability, which negatively impacts agricultural productivity and the environment. Additionally, the deterioration of security due to terrorism in specific regions in these countries contributes to political instability and weak government institutions. In such a fragile and volatile context, the proper execution of ***Soil Values*** may be affected by many risks that weigh on opportunities in the search for results. In the matrix (see annex), the most probable risks are described, together with their potential impacts on the program and the corresponding mitigation measures.

The consortium has extensive experience in all four countries with strong networks in the field, enabling them to apply adaptive management strategies to mitigate potential risks. Plan B, which aligns with the IFDC's Minimum Operating Safety and Security Standards, ensures a comprehensive approach to security and risk management. This approach is built on three security strategies: acceptance, protection and deterrence. IFDC uses a mix in all its operational zones, focused on acceptance and protection. While the first one entails building relationships with communities' partners, and local authorities, protection focused more on implementing measures, procedures, and policies to enable the organization to deliver services. In a continuous cycle and throughout the program, the risks will be mapped based on the threats, impact of the threat, the likelihood – which all decide the risk level and mitigation measures. The risk level will determine a yellow (low), orange (medium) or red (high) ranking which informs the measures for safety and risk mitigation. A variety of measures can be proposed such as a staff movement time frame: a defensive driving training; a staff phone tree for regular updates; developing situational awareness and the mitigating measures depend on the situation at hand. Aside from specific threats, the risk analysis will also inform a hibernation, relocation and evacuation plan per country.

In addition to the security strategy as a consortium, ***Soil Values*** will also have a dedicated security advisor who will work closely with IFDC's and SNV's security team and relevant security stakeholders in the region. To ensure a thorough understanding of risks and effective risk mitigation, the program teams and implementers are locally based. The localized expertise of the teams further enhances risk management efforts, allowing for better contextualization and tailored approaches to addressing challenges in each country. In Mali, they possess extensive knowledge of the specific context in regions such as Koulikoro, Mopti, Segou, and Sikasso. Similarly, in Burkina Faso, Niger and Nigeria, the team comprises individuals with in-depth understanding of the local context, especially in the conflict prone regions targeted by the program. By combining experience, a thorough risk analysis, adaptive management, and adherence to security standards, the consortium aims to mitigate risks and ensure program success in all four countries.

# 9. Soil Values Program Budget and Value for Money

## 9.1. Soil Values Program Budget

The budget for Soil Values Program, the response of the IFDC consortium to the DGIS SFGP Call has been prepared for €100 million for the anticipated 10-year period. It integrates the budget of all the consortium partners into the required DGIS format. The budget is presented by year, by result (intervention) area, and by country. The budget in Excel will be sent together with budget notes and with the liquidity forecast for years 2023-2028.

The Soil Values budget ensures even distribution over the chosen countries and even regional efforts across the countries. This distribution is in proportion to the number of targeted beneficiaries, taking into account country-specific variations in costs per beneficiary served, based on the implementation experience of the ***Soil Values*** team.

Adaptive management is embedded throughout the ***Soil Values*** program – from program governance through program design, to implementation and operations – allowing for changes at each of these levels to respond to evolving conditions, priorities, and needs. As such, the budget presented should be viewed as a framework-setting budget, as part of a process in which annual workplans and budgets will be finalized and presented for approval to DGIS. This will allow for adaptation based on program dynamics and changing country circumstances. The process will be aligned with the program's contractual as well as governance structure and decision-making modalities to be finalized at the start of the program and based on the partnership agreement signed between

the core partners in March 2023 in preparation for the SFGP Call. Highlighting the urgent need for adaptive management is the current crisis in Niger, which has not yet been taken into account in the budget (especially by country) and will be finalized in discussion with the ***Soil Values*** team and with DGIS at the start of the program. As such, "even distribution of the budget and value for money, per country and regionally" can only be understood in the context of the whole program and based on the program management approach.

If ***Soil Values*** is selected by DGIS as passing the competitive stage, then we anticipate that the budget will be updated based on discussions with DGIS, country priorities and dynamics, and findings from the first year of implementation.

## 9.2. Value for Money

Instead of being a traditional program with direct implementation of field activities by consortium partners to increase soil fertility, ***Soil Values*** uses three principles to realize impact or to generate value for money, ensuring that every cent invested yields the maximum impact at scale and sustainably. The first principle is *Capitalizing*: using proven concepts to enhance soil fertility, developed through previous (Dutch-funded and other) investments, expertise, and presence, taking existing knowledge as the foundation of the program to hit the ground running and not spend valuable resources undertaking studies and assessments that have already been conducted or development of new tools and methodologies. For example, ***Soil Values*** will leverage national soil fertility strategies or the ECOWAS regional agro-input strategy, as well as all the background documents, studies, and networks developed for the AFSH Summit (Q4 2023).

The second principle is *Mainstreaming Soil Fertility* to make soil fertility improvement an integral part of regional, national, and sub-national policies and programs, donor interventions, industry investments, and priorities of financial institutions. This means embedding soil fertility in all relevant policy instruments and advocating for the inclusion of soil fertility interventions in programs as well as donor strategy documents. To that end, ***Soil Values*** will leverage existing donor coordination platforms focused on soil health. DGIS can assist, guide, or lead in calling for such meetings.

The third principle is *Scaling and Leveraging*, which is working with and through national partners to ensure ownership, sustainability, and embeddedness and supporting ongoing and future projects and program from institutional investors, particularly the World Bank FSRP and others, such as AfDB Dakar 2 Summit, USAID Space to Place, and ECOWAS Roadmap on Fertilizers and Soil Heath, by adding or reinforcing soil fertility improvement to enhance impact on agricultural productivity and agro-ecological sustainability.

Measurable and attributable value added is in the increased production and sales of product by smallholders (to processors or other product buyers), increased use and sales of inputs (improved seeds, fertilizers, mechanization), added value through processing for different markets (including base-of-the-pyramid [BoP] markets), and value addition through creation of jobs (and related income). This money enters the rural economy. Based on our indicators and their target values used in the proposal, we conservatively estimate the economic impact for the duration of the project to exceed €2 billion. This equates to €20 for each euro invested by DGIS, bringing returns of €1,333 to each of the 1.5 million small-scale food producers and €1,000 to each hectare of farmland in the Sahel that ***Soil Values*** will impact over the 10-year program period.

Invaluable to the immediately measurable and attributable value add are the long-term achievements of the program, including sustainable use of soil, enhancement of biodiversity and resilience of the agro-ecological system, improvement in food security and social capital, capacity building and systems transformation, and reduction of conflicts involving human life, cattle, and crops losses, that will endure into the future.

**Operational Efficiency**

Through its efficiency, ***Soil Values*** increases the percentage of funding available to generate value for money. The current on-the-ground presence of the ***Soil Values*** team (offices, staff, vehicles) allows us to hit the ground running. Procedures (recruitment, admin/finance, procurement, compliance, safety and security, ethics) are in place and have been approved by DGIS through the Coordinated Relationship Management Agreements of the core partners of the consortium. Our existing network of partners from public/private sector, other DGIS-funded

programs, and other programs from the donor community likewise allows us to leverage these relationships for immediate program delivery and impact.

Operational efficiency is evidenced by the following metrics:

- Investing >80% of the grant funds in staffing and operations.
- >50% of the grant will be used for program activities.
- A minimum of €15 million over the 10-year program period will be implemented through national partners.

**Effectiveness**

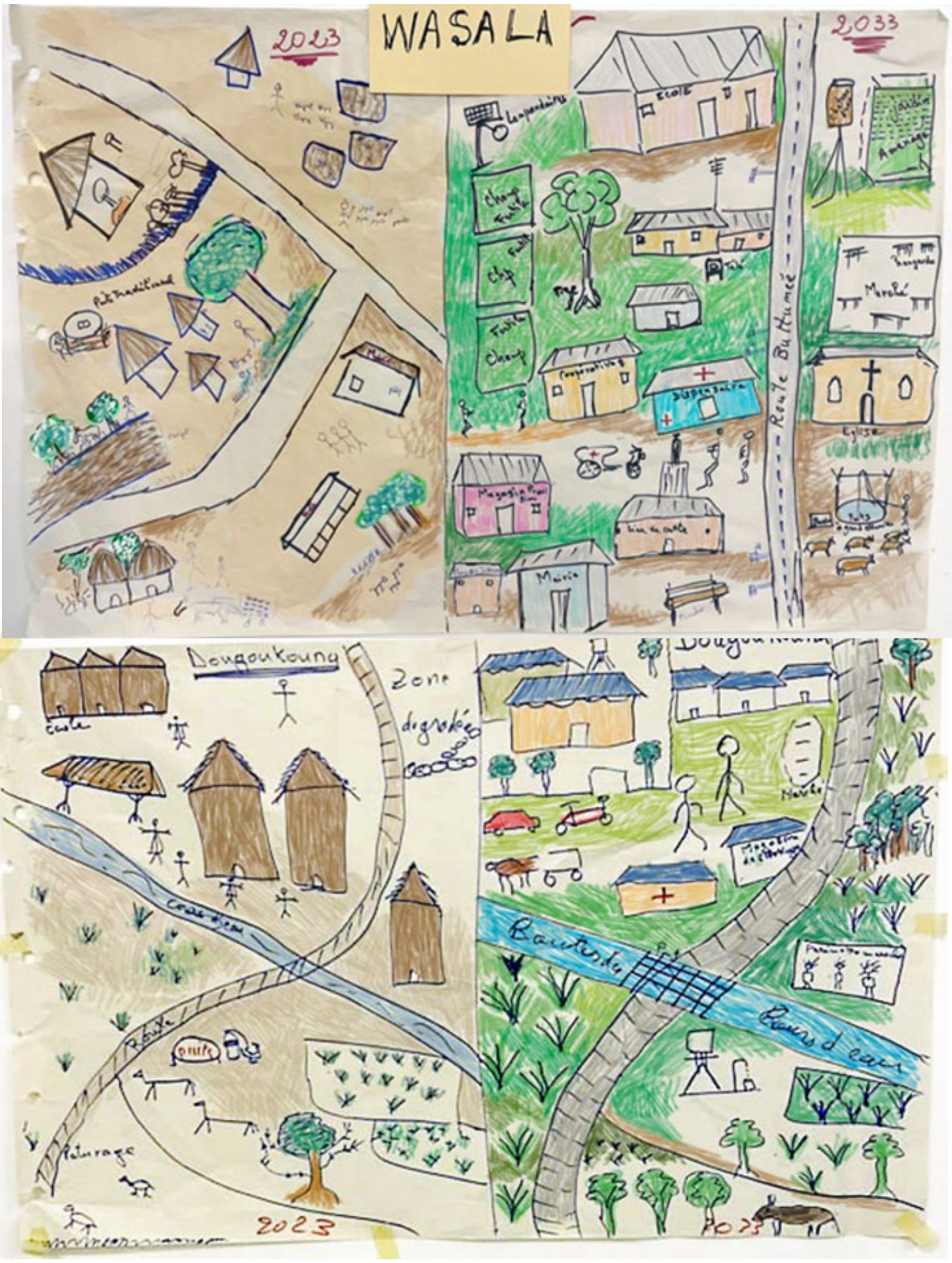
***Soil Values*** is effective because we employ proven approaches (often developed through Dutch funding) with the capability of producing DGIS's desired results, the ability to produce the desired output, while our interventions will have the intended or expected outcome. ***Soil Values*** outcomes (as illustrated in our Theory of Change) are both quantifiable (in terms of increased productivity and incomes, area under sustainable land use, value for money) and attributable to Dutch funding. ***Soil Values*** will effectively position DGIS as investor and opinion leader the African Union Fertilizer and Soil Health Action Plan in the four countries, beyond the reputation DGIS already has in agricultural and economic development.

We will maximize effectiveness by quadrupling the DGIS budget. ***Soil Values*** intends to leverage €300+ million in additional funding to increase the impact of the DGIS SFGP investment. This is comprised of:

- €100+ million from buy-ins from development partners (bilateral, multilateral, and foundations) in soil fertility funding for the Sahel.
- €100+ million from the private sector (fertilizer and agri-food industry) for soil fertility business models in the Sahel.
- €100+ million and in fertilizer sector financing for soil fertility improvement in the Sahel.

**Sustained Development Impact**

Conceptualization of ***Soil Values*** is based on decades of experience in science, policy, development assistance and program implementation gained by each member of the ***Soil Values*** consortium. Society must step up to safeguard the sustainable utilization of the earth's natural resources for its well-being. Unnoticed and undervalued are soils, which are foundational to provide water and nutrients to crops for feeding animals and humans: our most basic needs. DGIS has risen to assume this societal responsibility to allow policymakers, private sector actors, and other stakeholders to develop mechanisms that result in the appropriate valuation of soils for their sustainable management. ***Soil Values*** coalition partners embrace this opportunity to assist in the development of these mechanisms for the sake of global stability in a humane world.




*Panels developed by participants in the in-country workshops. For each panel, the left side presents the situation at the start of Soil Values and the right side shows the anticipated improved situation in 2033, after 10 years of Soil Values*