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Strategic partnership for the Fertile Grounds Initiative

A rapid appraisal of networks, organizations, programmes,
projects and private sector engagement in Soil Fertility
Initiatives in Sub Saharan Africa

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Disclaimer:

This desk-study was completed in a period of 20 days spread out over 2 months by staff members of KIT, and is by no means exhaustive. It provides information about the prominent networks, organizations, programs and projects addressing soil fertility issues, and a brief overview of private sector engagement in Sub-Saharan Africa. The opinions and ideas shared by the authors are their responsibility and do not engage in any formal way organizations and networks mentioned in the study, including the Fertile Grounds Initiative or the Food & Business Knowledge Platform.

Acronyms

ACB	African Centre for Biosafety
ACT	African Conservation Tillage network
AfNET	African Network for Soil Biology and Fertility
AfSIS	Africa Soil Information Service
AGRA-SHP	Alliance for a Green Revolution in Africa- Soil Health Program
ASARECA	Association for Strengthening Agricultural Research in Eastern and Central Africa
ASHC	Africa Soil Health Consortium
CA	Conservation Agriculture
CCADERSA	Centre for Coordination of Agricultural Research & Development for Southern Africa
CG CENTRES	Centres of the Consultative Group on International Agricultural Research
CIAT	International Center for Tropical Agriculture
CIMMYT	International Maize and Wheat Improvement Center
CSO	Civil Society Organizations
F&BKP	Food & Business Knowledge Platform
FANRPAN	Food, Agriculture and Natural Resource Policy Analysis Network
FAO	Food and Agriculture Organization of the United Nations
FGI	Fertile Grounds Initiative
GSP Initiative	Global Soil Partnership
ICRISAT	International Crops Research Institute for the Semi Arid Tropics
IFDC	International Fertilizer Development Centre
IFPRI	International Food Policy Research Institute
IITA	International Institute for Tropical Agriculture
ISFM	Integrated Soil Fertility Management
KIT	Royal Tropical Institute
LUANAR	Lilongwe University of Agriculture and Natural Resources
NARES	National Agricultural Research and Extension System
NARS	National Agricultural Research System
NEPAD	New Partnership for Africa's Development
SADC	South African Development Community
SOFECSA	Soil Fertility Consortium for Southern Africa
SSA	Sub-Saharan Africa
SWMNet	Soil and Water Management Network
TSBF-CIAT	Tropical Soil Biology and Fertility (TSBF) Institute of CIAT
UZ	University of Zimbabwe
WUR-CDI	Wageningen University Research centre-Centre for Development Innovation

Executive Summary

Soil fertility management has been identified and selected as one of the knowledge areas of the Food & Business Knowledge Platform (F&BKP) initiated by the Dutch Ministry of Foreign Affairs to address the main themes of the Dutch development policy. In order to address the problem of declining soil fertility, the F&BKP is interested to facilitate the sharing of knowledge about existing and new approaches that will improve recycling of nutrients, increase soil organic matter content and judicious application of fertilizers.

The Fertile Grounds Initiative (FGI) is a Dutch network created for collaboration and alignment between different actors in nutrient management. Keeping in line with the principles of ISFM, FGI proposes a set of activities for exchange or trading of nutrients across levels ranging from field- and farm-scale to districts or watersheds, to national, continental and global policy arenas, based on well-organized nutrient supply and concerted action of various stakeholders at different levels of scale.

The FGI team is exploring possible strategic partnerships with networks and organizations and identifying specific entry-points to take this idea forward. In order to assist them in this endeavour The Royal Tropical Institute (KIT) was commissioned by FGI and F&BKP, to conduct an exploratory study. The main aim of the study is to provide suggestions on who could be FGI's potential partners and what are perspectives for FGI to engage with them. The report is written to provide FGI ideas and concrete steps to anchor and start proposed pilots in Sub Saharan Africa (SSA). In addition, the FGI partners and the F&BKP Office expect to use the report as a basis to decide on knowledge related strategic issues and to identify opportunities for next steps.

In close consultation with F&BKP and FGI representatives, the KIT team undertook the soil fertility exploratory study from mid-August to mid-October 2014. This report is an outcome of desk-study research using primary and internet sources in combination with a number of semi-structured interviews.

The main issues related to soil fertility management and use of ISFM technologies consist of content issues (technological), material or structural issues (organizational) and issues related to the institutional factors that influence the performance of technological and organizational factors that affect or influence the farmers, extension mechanisms, research agenda and policy making. For instance, key issues in policy making included the way fertilizer policies are formulated in SSA, while research related issues pointed to limited research facilities, lack of trained manpower and therefore an inability to generate evidence to show benefits of soil fertility management practices. There are limited avenues for dissemination of research information to farmers and farmer's problems are related to lack of access to appropriate technologies and information.

There are several functional national and regional networks in SSA working on various aspects of soil fertility and related topics, hosted by different international and/or national organization or ministries of the member countries, and funded by private foundations, bilateral and multi-lateral organizations and banks, as well as governments. The regional

networks a) have different focus, functions, clients and roles, b) interact with smallholder partners via their national partners, and c) have scattered evidence of workable soil fertility interventions. Other organizations focus on development of input and output markets that directly influence small-scale farmers' uptake of technologies and new practices.

In addition, there are several projects addressing soil fertility issues either as the sole focus or as a component of larger agricultural improvement and food security programmes. Some focus on a) improving soil fertility by maximizing biological nitrogen fixation (N2Africa); b) create content for extension; c) increasing smallholder farmers' access to locally appropriate fertilizers; d) creating conditions for smallholder farmers to be able to afford fertilizer use by creating market access, credit and finance access, and e) assistance to farmer organizations and advocacy for national policies that are favourable to smallholder farmers. The programs cover a wide range of stakeholders at local, national, and regional levels ranging from farmer organizations, private agro dealers and distributors, CSOs, NGOs, NARS, extension departments, international institutions including CG centres, and private seed and fertilizer companies. The role of the private sector has primarily been more as a supplier, although some players do engage with small farmers in providing input-output services. Public private partnerships that address soil fertility issues are in exploratory stage and are more seen in cash crop value chains.

The respondents interviewed expressed concerns about the idea of FGI to explore nutrient exchange and trading, and foresaw problems like high costs and logistics difficulties in transportation of the material across locations, and limited quantity of organic material available. Small farmers do not have enough manure to exchange, and fertilizers and organic manure is primarily used by the resource rich farmers. Even after closing the nutrient cycle, over time, there will be reduction in the overall nutrient content in organic matter.

The interviews pointed to a range of possibilities that could contribute to areas with limited soil fertility and nutrient availability. These viewpoints have been summarized as four recommended pillars of action (see next page).

It is apparent that the FGI would first need to invest time and effort to address some immediate areas of concern of the actors, covered in the 4 pillars, in order to create readiness for acceptance and implementation of its approach. Of the four pillars, Pillars 1 and 4 entails advocacy solutions, and therefore given FGIs current competencies, they will have to work closely with local partners to convert these pillars into action. Pillar 2 refers to supporting existing networks such as SOFECSA in knowledge management to consolidate the evidence generated on the ground so far, and use that to create knowledge products for use in advocacy as well as extension for promoting context-specific solutions. FGI requires more applied research opportunities to create interest and support within Africa (Pillar 3).

Pillars	Partnership to initially focus on -	Potential partners
1. Strengthening and broadening scope of existing regional/ sub-regional networks	Institutional development, technical backstopping and funding to bring together the expertise, knowledge and meta-networks available with each of these networks.	SOFECSA; ACT; FANRPAN
2. Support frameworks for knowledge management and communication of ISFM	This Pillar will draw on the wealth of knowledge and evidence on ISFM generated over the years by diverse institutions, individual researchers and networks to develop training and extension materials, support for tailoring of ISFM technical materials to generate context-specific solutions at the field, farm and landscape levels within specific agro-ecologies	SOFECSA, ASARECA, CRS
3. Commissioning pilot studies on using ISFM approaches at community level	Mega consortia that can embrace the diverse agro-ecological, socio-economic and livelihood systems across Africa, and provide space for testing alternative technical and institutional approaches with communities and diverse actors.	ASARECA, ACT, CRS, CARE SOFECSA, AGRA-SHP
4. Influencing change in existing policy and institutional landscapes that link ISFM to global development	Development of operational frameworks to link with regional economic organizations and create a policy space to advocate for inclusion of ISFM as an option for addressing climate change.	ASARECA FANRPAN SOFECSA

In conclusion, before the FGI can embark on partnerships to promote the new approach, consolidation of all available evidence is needed to substantiate FGI's claim that nutrient based approaches are the most effective way forward to sustainably enhance soil fertility. The next step is to create the conditions for FGI to promote the approach by strengthening and broadening the scope of existing networks and organizations including NGOs and farmer organizations. Finally, FGI simultaneously needs to explore the possibility of collaborating with private sector initiatives that are presently engaged in promoting fertilizer use for productivity enhancement.

1 Introduction

Background to the Study

There is growing concern that inappropriate land use, poor management and lack of inputs have led to a decline in long-term soil productivity that has been seriously limiting food production in the developing world, and that the problem is getting worse. To offset the losses, steps are being taken such as recapitalization of soil fertility, increased use of inorganic fertilizer, and more efficient recycling nutrients through biomass within the farming system. On the one hand over-application of inorganic and organic fertilizers has led to environmental problems in a number of areas in the developed world, whereas on the other hand, insufficient application of nutrients and poor soil management, along with harsh climatic conditions and other factors, have contributed to soil mining and overexploitation and degradation of soils in Sub-Saharan Africa (SSA).

Soil fertility management has been identified and selected as one of the knowledge areas of the Food & Business Knowledge Platform (F&BKP) initiated by the Dutch Ministry of Foreign Affairs to address the main themes of the Dutch development policy. The Ministry is investing in a knowledge base for its policy on international cooperation by supporting research and the development and exchange of knowledge. The Knowledge Platforms are an important tool to this end. The platforms aim at research to respond more closely to the needs of development policy and practice.

Integrated soil fertility management (ISFM) is a set of agricultural practices adapted to local conditions to maximize the efficiency of nutrient and water use and improve agricultural productivity. ISFM strategies center on the combined use of mineral fertilizers and locally available soil amendments (such as lime and phosphate rock) and organic matter (crop residues, compost and green manure) to replenish lost soil nutrients. This improves both soil quality and the efficiency of fertilizers and other agro-inputs.

The F&BKP is an open and independent initiative where representatives from international networks and organizations of business, science, civil society and policy come together to share, critically reflect on and generate knowledge and feed practices and policies on food and nutrition security. In order to address the problem of declining soil fertility, the F&BKP is interested to facilitate the sharing of knowledge about existing and new approaches that will improve recycling of nutrients, increase soil organic matter content and judicious application of fertilizers¹. Among those is Integrated Soil Fertility Management (ISFM, see box) to increase the productivity of soils. The Fertile Grounds Initiative (FGI) was designed on request of the Netherlands Ministries of Economic Affairs and Foreign Affairs to explore new or different approaches to bring soil fertility to the forefront of (inter)national discussions. FGI is a coordinated strategy to create collaboration and alignment between different actors in nutrient management. FGI's main aim is to bring together organic and mineral nutrient flows to increase nutrient availability, efficiency and value not only to improve agricultural productivity but also strengthen the ownership and economic

¹ Food and Knowledge Business Platform website (<http://knowledge4food.net/theme/soil-management/>) accessed on 02/11/2014.

independence of smallholder farmers. FGI has organized a start-up event and has completed a study analysing issues and interventions to address decline of soil fertility.²

Scope of this study

There are a number of initiatives and programs addressing soil fertility, which vary in scale/ input levels and time perspectives (van Beek et.al. , 2014). The large scale interventions include voucher-based subsidy schemes to promote the use of chemical fertilizers, implemented in countries like Malawi, that resulted in productivity enhancement and increased incomes for maize producers (Futures Agricultures, 2009) but also suffered pitfalls in technical and implementation design efficiency, targeting and corruption (Dorward and Chirwa, 2009). Small scale interventions range from promoting leguminous crops such as soybeans, clover, alfalfa and groundnuts, conservation agriculture (CA) with minimum or no tillage, composting of organic waste and soil conditioning to improve the physical quality of the soil for better nutrient and water retention. The choice of interventions depends on the development pathway where the high input-quick response interventions reflect a market-driven development pathway and the low-input, slow response interventions reflect more ecological development pathways. The increasingly dominant paradigm of thinking towards enhancing agricultural productivity is one of ‘market-led diversification and intensification’. Whilst linkage to markets can provide the opportunities for purchasing fertilizers to drive up productivity, not all market-led intensification leads to sustainable production systems (Giller, 2013). Nonetheless, there is consensus that ISFM practices i.e. interventions that can integrate organic and mineral sources of nutrients, based on local conditions and with due attention to the key factors that determine their application by smallholder farmers in the region, should be the way forward to improve the productive capacity of soils.

Keeping in line with the principles of ISFM, FGI proposes a set of activities for exchange or trading of nutrients, in a concerted way, across levels ranging from field- and farm-scale to districts or watersheds, to national, continental and global policy arenas. These activities include inventory of resources availability and requirement, processing and product formulation, brokering, managing logistics, building capacities and institutions, and creating an enabling environment for long term sustainability of the initiative. The mainstay of this approach is ‘nutrient brokerage’ to meet nutrient demands of a production system, based on a well-organized nutrient supply that will integrate resources and link stakeholders at different levels of scale. Concerted actions of various stakeholders are considered crucial for the success of change. Finally, advocacy is proposed.

The FGI team is exploring possible strategic partnerships with networks and organizations and identifying specific entry-points to take this idea forward. In order to assist them in this endeavour The Royal Tropical Institute (KIT) was commissioned by FGI and F&BKP to conduct an exploratory study.

² Report: Soil Fertility in a Changing World Resultaten van de Ronde Tafel Discussie op 13, December 2013 in Wageningen (http://knowledge4food.net/wp-content/uploads/2014/06/131213_verslag-rondetafelbijeekomst.pdf)
FGI brochure: http://knowledge4food.net/wp-content/uploads/2014/06/140501_fgi-brochure.pdf

The main aim of the study is to provide suggestions on who could be FGI's potential partners and perspectives for FGI to engage with them. The report is written to provide FGI ideas, concrete steps, etc. to anchor and start the proposed pilots in SSA. In a way, this study also intends to contribute to the discussion on the need for a new approach to restore or retain soil fertility in an economically, socially and ecologically sustainable manner, and present an overview of driving or blocking forces.

The report proceeds as follows: the next section outlines the problem statement and methodology. Section three describes the findings of the study in terms of the issues related to soil fertility, and the key actors i.e. networks and organizations, major programmes and projects, and private sector initiatives addressing soil fertility issues. The section also mentions the limitations/ shortcomings of the current situation. The following section discusses perspectives for FGI to engage with the existing actors, and in conclusion, the paper emphasizes the immediate steps to action for FGI to shortlist/ identify potential partners.

2 Problem statement and methodology

In their study, van Beek et al. (2014) indicate that interventions that have been carried out to improve nutrient use and increase the productive capacity of land, have not fully addressed the problem of disconnected nutrient flows. In response, FGI proposes additional actions that entail aligning the approaches of various stakeholders at different levels of scale for optimization and redistribution of locally available resources, supplemented with external inputs. It is envisaged as a multi-stakeholder approach to help this transition towards sustainable nutrient management at various spatial levels (van Beek et al., 2014). This means that the soil fertility problem is seen as a distribution problem, across scales ranging from farm level to landscape to national level and beyond to continent or global scale. The mismatches between nutrient flows at each level are attributed to differences in geographical settings, land management practices, climate change and also national policies that regulate the use of nutrients. Market forces also play an important role, where the cost of soil fertility (or 'displaced nutrients') is not included in the price for produce supplied by smallholders in SSA.

In order to develop business cases for local implementation of the approach, FGI has been on the lookout for potential partners primarily in SSA. Identification of partners will be based on a preliminary understanding of active international, regional and local networks, probable entry points for action, and other recent initiatives to address the topic of maintaining soil fertility, especially collaborative initiatives between private sector, producer organizations, civil society organizations, policy makers and scientists. Based on information about the type of interventions currently taking place, including programmes to restore soil fertility, knowledge and innovation activities and nutrient brokering initiatives, the study aims to answer the following main research questions:

- Who are the leading international institutes and networks working on soil fertility?
Include a power analysis of these networks What are the key platforms/networks for engagement between these institutes and networks?

- Which partners and networks does the FGI network already identify as having a potential as strategic partner?
- What are the leading themes of these networks related to soil fertility
- Who are the leading institutes and networks in Africa and other regions working on soil fertility?
- What are the perspectives for the FGI to engage with these networks?

In close consultation with F&BKP and FGI representatives, the KIT team undertook the soil fertility exploratory study from mid-August to mid-October 2014. This report is an outcome of desk-study research using primary and internet sources in combination with a number of semi-structured interviews (see interview checklist in Annex 2). Based on their availability and willingness to talk, a total of 18 experts representing national, regional and sub-regional networks, university researchers, research institutes and multilateral organizations and major programs and project addressing soil fertility issues, were interviewed as part of the process. The list of persons interviewed is presented in Annex 3. The interviews were conducted by the three team members. In cases where nobody was available to be interviewed by the study team, information was gathered from internet based secondary sources.

3 Findings

3.1 Leading international and African networks and organizations working on soil fertility.

There are several functional national and regional networks in the SSA working on various aspects of soil fertility and related topics. Table 1 provides details about currently operational major regional networks and leading international organizations. The networks are currently hosted by different international and/or national organization or ministries of the member countries. Funding sources include private philanthropic foundations, bilateral and multi-lateral organizations and banks. Member countries also contribute in funds and in kind.

Table 1. Prominent networks and organizations working on soil fertility issues in SSA

Name	Nature of organization (+legal status) and geographic focus	Purpose/Primary Objective	Level of stakeholders involved	Funding sources
The Soil Fertility Consortium for Southern Africa (SOFESCA) (2005-)	A loose and open network currently dependent on hosting capacity of member organizations in five Southern African countries	To develop and promote technical and institutional innovations to enhance contribution of ISFM to sustainable food security and livelihood options	Consortium anchored on national research and extension systems including private seed and fertilizer companies.	Initial development phases were funded by the Rockefeller Foundation and significant in-kind contributions by members

Name	Nature of organization (+legal status) and geographic focus	Purpose/Primary Objective	Level of stakeholders involved	Funding sources
Soil and Water Management Research Network (SWMnet) of the African Association for Strengthening Agricultural Research in East and Central Africa (ASARECA) (1998-)	Closed and defined network of ASARECA. One of their 17 networks in East and Central Africa.	To provide access to and utilize knowledge information and technologies on soil and water management through networking with stakeholders at different levels.	Stakeholders at national regional and international level - research and extension departments, training institutes, NGOs, national soil laboratories, universities, ASARECA project partners, professional societies, regional centres, CG centres, multi-lateral donors and advanced international research institutes..	EU is the main donor; other donors include the World bank, UN –FAO, UNEP, GEF, IFAD, IPTRID, and African Dev Bank, Global Water Partnership among others.
Food, Agriculture and Natural Resources Policy Analysis Network (FANRPAN) (1994-)	Open network with an Africa wide mandate (19 member countries in East and Southern Africa)	Main focus on capacity building, linking research evidence to policy, advocacy and dialogue on food and nutrition security issues	Works closely with government institutions and regional economic communities; has strong links with NGOs, farmer organizations and private sector	Bilateral and multi-lateral donors, B&M Gates Foundation
African Conservation Tillage network (ACT) (1998-)	Semi-closed due to special focus on Conservation Agriculture (CA) and tillage with geographical focus on Eastern and Southern Africa with a sub-regional office in West Africa	To enhance agricultural productivity , sustainable land management and environmental conservation through promotion of CA technologies.	Brings together research and development partners including farmers, NGOs, private seed and equipment manufacturers, CA policy makers at national and regional levels.	Founded by initial support of GIZ, FAO and Agr. Research Council of Africa (ARC)
African network of the Soil Biology and Fertility (AfNet) of the Tropical Soil Biology and Fertility Institute of CIAT TSBF); (1988-)	Although Africa wide, has operated predominantly as an East Africa network; Functionality has remained obscure after the closing down of TSBF	Formulating and promoting research agenda on soil biology; Major contributor to the ISFM paradigm	International donors and advanced research institutes. CG system, national institutes; involvement of NGOs and private sector has been weak	CIAT funders

Name	Nature of organization (+legal status) and geographic focus	Purpose/Primary Objective	Level of stakeholders involved	Funding sources
International Fertilizer Development Centre (IFDC); (1974-) Pan-African	IFDC is a non-profit international organization, governed by an international board with representation from developed and developing countries.	Enabling smallholder farmers to increase agricultural productivity, and practice environmental stewardship by enhancing their ability to manage mineral and organic fertilizers responsibly and participate profitably in input and output markets.	International agricultural research centers, numerous national and non-governmental organizations and the private sector	Supported by various bilateral and multilateral organizations, private foundations and national governments. Netherlands is a main donor
Centre for Coordination of Agricultural Research and Development for Southern Africa (CCARDESA) Multi-donor funding via World Bank	To facilitate integrated agricultural research for development ⁷ within the SADC region with the aim of contributing to increased productivity of smallholder crop, forestry, fish and livestock enterprises in the region.	<ul style="list-style-type: none"> -Establishing and maintaining effective collaborations and partnerships with regional and continental stakeholders; -Mobilizing and deploying resources for implementation of regional activities; -Carrying out advocacy work with regard to CAADP; -Facilitating development of innovative ways of information dissemination and scaling out demand driven innovations; -Developing and implementing regional programs that address cross cutting issues of environment, youth participation, gender equity, and nutrition security. 	Works directly with actors in the NARS: agricultural researchers; extension agents and advisory services providers; and seed producers and suppliers. Ultimate beneficiaries of CCARDESA activities are farmers, livestock producers, agro-processors, and other end user of CCARDESA generated knowledge products.	Centre for Coordination of Agricultural Research and Development for Southern Africa (CCARDESA) Multi-donor funding via World Bank

In addition to those listed above, there are actors at the sub regional level are the Forum for Agricultural Research in Africa (FARA), the apex continental organization responsible for coordinating and advocating for agricultural research for development (AR4D), and considered as an entry point for agricultural research initiatives designed to have a continental reach or a sub-continental reach spanning more than one sub-region; the West and Central African Council for Agricultural Research and Development (CORAF/WECARD)

set up to improve the efficiency and effectiveness of small-scale producers and promote the agribusiness sector, and has 22 NARS members; and the Pan African Agro-business and Agroindustry Consortium (PanAAC) a private sector driven platform bringing together agribusiness and agro industry value chains.

Creating effective partnerships requires clarity on the reason to partner, careful planning, clarity about expectations, roles, resources and commitment of all concerned parties. From this table it is evident that the regional networks have different focus, functions, clients and roles. For instance, with reference to addressing soil fertility, SWMNet focuses on soil and water management of which soil fertility is only one component, Act looks at soil fertility in the context of Conservation Agriculture, whereas FANRPAN with its focus on policy advocacy for issues related to natural resource management as a whole is the farthest from addressing soil fertility issues. SOFECSA is probably the only network that focuses solely on soil fertility management issues. Secondly, except FANRPAN, all networks interact with smallholder partners via their national partners. The initiatives are independent of each other and scattered therefore a linking and coordinating function could be very relevant. From the interviews, we gather that there is a need for the existing networks and organizations to go beyond issues of transferring knowledge from stations to farms, to address the broader interdisciplinary policy and institutional issues across geographies. For FGI, forging strategic partnership depends upon the level of political entry it is seeking in order to influence policy and institutional change at the national or regional level in Sub-Saharan Africa. In terms of working with these existing networks FGI could consider providing assistance for stronger vertical integration, stronger evidence generation from the ground level by working with partners on the ground such as NGOs, CSOs and private sector to address real life problems of the communities and help them to link with policy platforms.

As an initiative from The Netherlands, the FGI network will have the opportunity to work closely with stakeholders that are central in the Netherlands' bilateral programmes in key African countries. In these programmes, IFDC is a major player. As per IFDC's Strategic Plan 2012-2015³³, one of their main objective is to "*pioneer and catalyze improved plant nutrient performance by developing and disseminating new technologies and practices to smallholder farmers using a range of innovative delivery mechanisms*". These technologies and practices should address challenges of mineral and organic fertilizers, including how to increase nutrient use efficiencies of the various crops, to reduce the possible environmental damage caused by leaching into ground/surface water, and to avoid the depletion of key crop nutrients such as nitrogen, phosphorus and potassium. IFDC also recognizes that development of input and output markets directly influences small-scale farmers' uptake of technologies and new practices. It engages with stakeholders, including entrepreneurs, government ministries, regional economic communities, local authorities, private sector companies, non-governmental organizations, professionals, community members, academics and donors as well as countries' citizens and others.

³³ [http://www.ifdc.org/getattachment/About/IFDC-s-Strategic-Plan-\(2012-2015\)/IFDC_StrategicPlan_web-1.pdf](http://www.ifdc.org/getattachment/About/IFDC-s-Strategic-Plan-(2012-2015)/IFDC_StrategicPlan_web-1.pdf)/ accessed 25/10/2014

3.2 Major programs and project addressing soil fertility issues in SSA

It is difficult to ascertain the exact number of projects addressing soil fertility issues either as the sole focus or as a component of larger agricultural improvement and food security programmes. However, in the interest of time, the team selected seven major initiatives on the basis of their content i.e. dedicated focus on soil fertility issues, and geographical coverage i.e. multi-country coverage within the region. Soil fertility components are included in other programmes funded by multi-lateral donors such IFAD and EU through projects implemented by IFDC, ASARECA etc. some have been partly funded by the Bill and Melinda Gates Foundation, IFAD, and the government of Netherlands. Their investment aims to improve soil fertility by e.g. maximizing biological nitrogen fixation with soybeans, groundnuts, common beans, and cowpeas in eight countries; giving farmers and policymakers knowledge on ISFM technologies including efficient mineral fertilizer and organic matter use; increasing smallholder farmers' access to locally appropriate fertilizers; creating conditions for smallholder farmers' to be able to afford fertilizer use by creating market access, credit and finance access, assistance to farmer organizations and advocacy for national policies that are favourable to smallholder farmers.

The programs cover a wide range of stakeholders at local, national, and regional levels ranging from farmer organizations, private agro dealers and distributors, CSOs, NGOs, NARS, extension departments, international institutions including CGIAR centres, and private seed and fertilizer companies. A brief description of the major programs and projects highlighting their geographic focus, mission, approach, main activities and level of stakeholders they interact with, is given in Table 2.

Table 2. A selection of major programs and projects addressing soil fertility issues currently operational in SSA.

Project and geographic focus	Mission/Purpose	Approach/main Activities	Level of stakeholders involved
African Soil Health Consortium (ASHC) led by CABI International and funded by the Bill & Melinda Gates Foundation – East Africa	Project contributing towards bringing about a radical change in the understanding and use of ISFM techniques in Sub-Saharan Africa	<ul style="list-style-type: none"> - Content broker to generate usable generic material as well as crop specific guides for use by extension workers; - Created a web platform to facilitate cross learning; (does not have resources to scale up production and widespread dissemination) 	Interacts with stakeholders at national and regional levels, NGOs and donor funded projects and initiatives, including AGRA (Alliance for a Green Revolution in Africa) and its grantees.
Africa Soil Information Service (AFSIS), funded by the Bill & Melinda Gates Foundation	Pioneering innovative methodologies, products, tools, and systems to improve the way that soils are evaluated, mapped, monitored and made accessible, in a accurate and speedy manner, in order to support high economic, social, and	<ul style="list-style-type: none"> - Developing norms, standards and evaluation criteria for evaluating soil degradation and recovery processes, as well as soil functional properties - Developing robust statistical inference mechanisms to translate diagnostics into management recommendations; - Acquiring and interpreting data for digital soil mapping and soil health surveillance in SSA -Producing digital soil maps and environmental covariates; 	International organizations (TropAg, CIESIN, ISRIC, ICRAF, CG CRP on water, land and ecosystems (WLE); National governments (Nigeria, Tanzania, Malawi, Kenya, Ethiopia, Ghana)

	environmental returns on investments in agriculture in Africa.	<ul style="list-style-type: none"> - Developing a spatial database of soil management experiments in sub-Saharan Africa. - Linking soil management information to digital soil maps; - Facilitating the provision of evidence-based, spatially explicit soil management recommendations; - Training African soil scientists in AfSIS techniques. 	
AGRA Soil Health Program (ASHP) funded by Bill & Melinda Gates Foundation (2008-)	To increase income, improve food security and reduce household poverty by promoting the use and adoption of ISFM practices among smallholder farmers and creating an enabling environment for farmers to adopt the practices in an efficient, equitable and sustainable manner	<ul style="list-style-type: none"> - Disseminating ISFM technologies and scaling up adoption together with fertilizer and improved seed supply work; - Promoting ISFM by: <ul style="list-style-type: none"> o use of demonstration plots and field days to convey the benefits of ISFM technologies to farmers o Participatory and adaptive research to fine-tune fertilizer recommendations. o creating physical and financial access to appropriate soil nutrients and fertilizers through agro-dealers, o influencing governments to invest in ISFM, o strengthening capacity of national institutions 	National consortia in East and Southern Africa led by the International Plant Nutrition Institute (IPNI) ; in West Africa by IFPRI
N2 Africa Initiative (N2Africa) co-funded by the Bill & Melinda Gates Foundation	Building long-term partnerships to enable African smallholder farmers to benefit from symbiotic N ₂ -fixation by grain legumes through effective production technologies including inoculants and fertilizers.	<ul style="list-style-type: none"> - Activities focus on cowpea, groundnut and soybean, common bean, chickpea and faba bean: - As a ‘knowledge broker’, assists in communication of key extension messages - Capacity building by supporting research on legume agronomy, rhizobiology and approaches and methods for dissemination and extension through MSc and PhD candidates embedded in local universities; - Integrating gender as a cross-cutting theme into all research and development objectives; - Creating feedback loops between delivery & dissemination and research, to answer questions related to the tailoring/ adaptation of technologies, effectiveness of different dissemination approaches, and sales of inoculants and fertilizers by the private sector. 	National institutes, rural development NGOs, extension services, private input suppliers, traders and linking with inter-national initiatives embedded in the national system.
Global Agenda for Sustainable Livestock , FAO initiative (2010-)	The purpose of the Agenda partnership is to inform, guide and catalyze livestock sector practices towards more efficient use of natural resources including land, water, nutrients, greenhouse gas emissions are the initial focus.	<ul style="list-style-type: none"> - Generating large resource use efficiency, economic, and social gains through the use of technology, management practices, and policy and institutional frameworks; - Enhancing ecosystem services, productivity and livelihoods through the restoration, optimal management and utilization of grassland(s); - Reducing nutrient overload and greenhouse gas emissions through the recovery and recycling of nutrients and energy contained in manure. 	Public sector, private sector, research, civil society organizations/ NGOs, academia, inter-governmental organizations
Global Soil Partnership	The goal of the Global Soil Partnership is to provide a platform	<ul style="list-style-type: none"> - Organization of technical workshops to provide inputs into the plans of actions; 	linking national soil initiatives to regional or global

(GSP Initiative) (2013-)	that fills the gaps for consensus building and, with support from actors on the ground, achieves a real active partnership in each region	<ul style="list-style-type: none"> - Awareness raising on the importance of soils: including celebration of World Soil Day, the International Year of Soils as well as special events such as the Summer of Soils in Sweden (2013) and Global Soils Week in Berlin (2013); - Organization of the 1st GSP Plenary Assembly with countries and other partners; - Establishment of the Intergovernmental Technical Panel on Soils; - Establishment of Regional soil partnerships and development of the different action plans. 	soil communities for advice and support; functioning as a direct voice to policy makers at national, regional, and even local level; and ensuring that Africa's voice is heard at politically important events
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Source: Interviews with key informants and secondary/ internet sources

Besides the programmes listed above, there are also a number of programmes at the national level such as the AGRA-Scaling Seeds and Technologies Partnership (AGRA-SSTP) and CASCAPE in Ethiopia that are addressing soil fertility issues. The AGRA-SSTP programme is working in Ethiopia, Ghana, Malawi, Mozambique, Senegal and Tanzania to help governments strengthen their seed sectors and complementary technologies including blended fertilizers and rhizobium inoculation. SSTP is particularly interested to scale up the adoption of legumes and complementary technologies developed by N2Africa and its partners. CASCAPE is a joint effort of the government of Ethiopia and The Netherlands to improve agricultural productivity in Ethiopia by strengthening the capacity of stakeholders to create an evidence base for best practices, and scaling up of best and newly introduced practices. The CASCAPE approach aims at improving linkages between farmers, NGO's, private sector, universities, research institutes and policy makers.

Most projects and programmes are time bound (3-5 years) and have mandates to deliver on specific tasks. For instance, ASHC brings scientists and technical experts together to generate technical content for promotion and extension of soil fertility but does not have a constituency in the countries where it operates. Its mandate and activities are limited to the knowledge domain and does not involve actors that can provide advocacy support and/or take ISFM to scale. The projects reach different stakeholder groups at different levels through national partners including government and university researchers, private sector, NGOs, CSOs and inter-governmental organizations, each covering different constituencies at different spatial levels. Here too, FGI could play a coordinating role across the different levels.

3.3 Private sector involvement in soil fertility

Resolution 4 of the Abuja Declaration called for governments to take concrete measures to develop and strengthen the capacity of the private sector to play a critical role in the increased supply and use of fertilizers by small-scale farmers in sub-Saharan Africa (Africa Fertiliser Organisation, 2012). This led to the deregulation and liberalization of the fertiliser market in SSA. Policies deliberately develop agro dealer networks were formulated. Domestically, barring South Africa, SSA has always been a negligible producer of fertilizer, with recent production levels at 177,350 metric tons annually (representing about 0.10 percent of world output). Beginning in 1994, structural adjustment and economic liberalization contributed to

a sharp decline in production, as loss-making, state-owned and operated factories ceased production in Nigeria, Tanzania, Côte d'Ivoire, and Zambia. Other former producers, such as the Congo Democratic Republic, Mozambique, and Uganda stopped production in the late 1970s or the 1980s (Kelly and Crawford, 2007). Chemical fertilizer supply chains typically begin with importers, who interact with shipping agents, bankers, quality inspectors and various other players, and ends with agro-dealers and farmers. Yara International controls the market for NPK production in Cote d'Ivoire, Sable Chemical industries account for all Zimbabwe's ammonia production; Industries Chimiques produce all the phosphoric acid and NPK output for Senegal. Omnia fertilizer, a South African group with interests in mining, explosives, chemicals and fertilizers, and the Export Trading Group (ETG), founded in Kenya in 1967 has a presence in 30 countries in Sub-Saharan Africa and sells its Falcon fertilizer brand in 20 African countries.(ACB, 2013)

Yara, the Norwegian fertilizer manufacturer is one of the key private sector players behind the G8's New Alliance and the Grow Africa platform, a joint programme of the World Economic Forum (WEF), the African Union Commission (AUC) and the New Economic Partnership for Africa's Development (NEPAD) (ACB, 2013). Apart from Yara, who has the largest presence of the major multinational companies, the US fertilizer giant Mosaic's intervention in Africa is also to be noted through its involvement with the Millennium Village Project, for which it claims to donate US\$2 million worth of fertilizer each year. Several large firms from the former Soviet Union and the Middle East have been assisting the Ethiopian government with its fertilizer subsidy programme. Louis Dreyfus is one of the largest distributors of fertilizers and agro-chemicals in West Africa. In 2011 it acquired fertilizer company SCPA-Sivex International to help increase its presence in Africa (ACB, 2013).

Yara is keen to invest in developing a world-class fertilizer production facility in SSA. It is also assessing the viability of a potash mining facility in Ethiopia. Yara is partner in the Southern Agricultural Growth Corridor of Tanzania (SAGCOT) as one of its CSR initiatives. SAGCOT is an inclusive, multi-stakeholder partnership to rapidly develop the region's agricultural potential, initiated at the World Economic Forum (WEF) Africa summit in 2010. SAGCOT's model is based on private sector investment coming through, in addition to the public resources committed. As part of SAGCOT, Yara is constructing a fertilizer terminal in Dar es Salaam to facilitate sales to a growing agricultural sector in the region .

The re-emergence of fertilizer subsidies in many African countries has further complicated the role of the private sector. The subsidies have significantly undermined small private importers and retailers that were emerging under the donor support programs targeted to improving agribusiness acumen (Mason and Jayne, 2013). Private companies prefer catering to cash crop farmers, and have chosen to focus on inputs and credit facilities other than fertilizers, thereby neglecting the smallholder farmer beneficiaries of the subsidy program and producers of staple food crops necessary to maintain food security. This has raised questions about governments' importation and distribution policies, particularly with respect to depressing demand and discouraging private investment and development of techniques for soil fertility improvement.

Some private seed companies however are being increasingly engaged in on-going research and development initiatives on soil fertility. An example is the development of low-N tolerant and drought tolerant maize varieties by CIMMYT working with national research systems and private seed companies across Africa. These seed companies might be supporting learning and innovation platforms in major sub-regions in SSA.

Organic fertilizers have been and still are being used in many rural SSA countries as cost of production of them is low. However, the problem with organic manure is that of low content of plant nutrients and being bulky making transportation difficult. For FGI, it would be worthwhile to investigate the organic fertiliser trade and market situation.

In conclusion, the role of the private sector to date has been more as a supplier. Some players do engage with small farmers in providing input-output services, but there is scope to strengthen their role by training their staff on extension and develop business models oriented at smallholders. Public private partnerships that address soil fertility issues are in exploratory stage and are more seen in cash crop value chains. The African Cocoa Initiative (ACI) is an example of one such initiative that is bringing together the World Cocoa Foundation (WCF), cocoa industry members, the Dutch Sustainable Trade Initiative (IDH) and USAID. IFDC as one of the implementing agencies for the ACI, is providing expertise to improve participating farmers' access to fertilizer and is recommending appropriate fertilizer use. More innovations are needed in food crops.

3.4 Summary of issues related to soil fertility and promotion of ISFM in SSA

While analysing the information gathered from secondary sources and interviews, we have used a schema to create broad categories of the current issues in soil fertility in SSA. The schema offers a very simple grouping of the issues in soil fertility – one axis focuses on different dimensions of the issues namely a) technological, b) organizational, and c) institutional, while the other axis lists the different contexts in which these dimensions appear, such as policy related, research related, related to current field practice and farmer related (see Tables 3, 4 and 5). This categorization essentially helped to differentiate between content issues (technological), material or structural issues (organizational) and issues related to the conditions that influence the performance of technological and organizational factors i.e. institutional issues. Although there is a considerable overlap between the categories, the schema provides a perspective to understand current interventions (to address the issues) and their shortcomings.

Several researchers who have studied the policy reforms in various SSA countries indicate that the fertilizer policy formulation in SSA has always been trial and error and/or “bandwagon” type (Dittoh et al., 2013) The key informants also stated that the policies are not always based on diversity in agro-ecological and socio-economic conditions of farmers, and needed more critical analyses of the prevalent agronomic and economic situation in a given country. Some soil fertility consortia such as the Soil and Water Management Network (SWMNet) in East Africa and the Soil Fertility Consortium for Southern Africa (SOFECSA) have to some extent helped in collaboration of research initiatives among various actors in the

region. However, the rationale of policy makers and researchers differs and hence not all information generated by researchers is utilized for decision-making in agriculture management in most countries.

Table 3. Summary of key policy related issues in soil fertility (Source: Interviews with key informants).

Technological aspects	Organizational aspects	Institutional aspects
<ul style="list-style-type: none"> - Agriculture policies of most countries in SSA have outdated technical recommendations - limited fertilizer manufacturing capacity at national and regional levels - Climate change projections do not factor nutrient dynamics - Land policies and consequences for soil fertility management 	<ul style="list-style-type: none"> - Lack of funds and facilities for knowledge sharing; internet facilities inadequate and expensive - Poor database of fertilizer resources- both organic and inorganic- available in different locations 	<ul style="list-style-type: none"> - No alignment between policy makers and researchers' vision –ISFM not integrated into broader development agenda - Fertilizer subsidy schemes not aligned with technical packages and preconditions - Some major donors have shifted focus from soil fertility issues to themes such as CA and climate change conservation agriculture while soil fertility problems still remain unresolved; - Private companies doing contract farming focus on providing information about basic agronomic packages for productivity enhancement and do not include soil fertility management technologies; - Low price incentives for food security crops such maize and grain legumes - Need for balancing soil fertility and other forms of agricultural investments - Private sector fertiliser companies have limited direct engagement with farmers- they mostly interact with university researchers

Assessment of the distribution of fertilizer vouchers in sub-Saharan Africa echoes concerns with elite capture and politicization (DFID, 2014). In 2012, IFDC, an international not-for-profit organization, developed the "Accelerated agricultural intensification program for social and environmental Stability" (CATALIST) within the Central Africa's Great Lakes Region to improve agricultural productivity in Burundi, Rwanda, and the Democratic Republic of Congo (DR Congo), through an integrated approach combining sustainable agricultural intensification technologies, including ISFM, with farm-to-market linkages, agroforestry and infrastructure construction. IFDC also provided guidance and supported a fertilizer subsidy scheme in Burundi⁴. NGOs such as World Vision, CARE, Catholic Relief Services, Africare, and CSOs view soil fertility as an entry point for food and nutrition security interventions, but have not been able to push this forward as a development agenda, as they have limited skills and participation in soil fertility advocacy issues.

Soil fertility research related issues (Table 4) point to limited research facilities, trained manpower and therefore an inability to generate evidence to show benefits of soil fertility management practices. There are limited avenues for dissemination of research information to farmers. Programs such as ASHC have been providing extension departments with content and training, but government extension departments do not have adequate resources and motivated staff to scale up these messages. ACT is poised to upscale Conservation Agriculture (CA) and related sustainable management practices through partnerships.

⁴ http://news.xinhuanet.com/english/world/2012-01/28/c_131379923.htm accessed 17/11/2014

In the context of this study research is taken to include producers of codified knowledge such as national and international research organizations (NARIs, CGIAR, etc.), universities and technical colleges, private research foundations, and also some NGOs and private companies with research mandates. In this context, the issues related to field practice refer to the role and contribution of public and private advisory service providers and input suppliers and include NGOs, extension services, farmer associations, producer companies, and consultants.

Table 4. Summary of key research and extension related issues in soil fertility (Source: Interviews with key informants)

	Technological aspects	Organizational aspects	Institutional aspects
Research related	<ul style="list-style-type: none"> - Limited evidence to show improved physical benefits of soil management practices - Need for research to cover different geographical areas, diversity of farming systems, and farmers' conditions - Different soil fertility management scenarios depending on scale and production objective - Costs of current ISFM options are high with reference to labour demands, transportation and cash demands 	<ul style="list-style-type: none"> - Limited capacities in terms of laboratory facilities and trained technicians at national level - No ISFM strategies in research centres/institutes - No systems perspective in soil fertility research - Disaggregation of livestock and crop research 	<ul style="list-style-type: none"> - Continued research without designing scaling out interventions through multi-stakeholder perspective - ISFM technologies developed without assessing adoption potential - Need to channel resources towards adaptive research and piloting interventions rather than diagnostic type that does not offer concrete solutions - Research not part of wider multi-stakeholder setting or Fertilizer supply chain
Issues related to current field level practices	<ul style="list-style-type: none"> - Farmers do not have access to drought and stress tolerant varieties (maize) suited to different farming systems, being developed - Content of extension messages varies - government follows blanket NPK based recommendations; - NGOs focus on organic inputs and target women farmers; - limited awareness about the value of soil as a primary resource in environmental management. 	<ul style="list-style-type: none"> - Poor infrastructure for distribution of ISFM inputs and support mechanisms - Language barriers and limited knowledge of information dissemination methods relevant to farmers problems - Lack of knowledge about innovative approaches to disseminate information about soil fertility; - Farmers literacy and typology not taken into account - Lack of adequate resources to develop and produce extension material - Poor access to published information 	<ul style="list-style-type: none"> - Need non-aligned, apolitical platforms for information and knowledge sharing based on scientific research - Information about ISFM is scattered - Disconnect between research and extension in public and private sector - Disconnect between extension and private input supply chains

Issues listed in Table 4 suggest that the content of government extension services is founded on traditional NPK based nutrient management and is limited in terms of context-specific recommendations, and addressing micronutrient deficits for different crops. The Africa Soil

Health Consortium (ASHC)⁵ has been creating content as creative commons products and it is for their partners in the region to increase uptake and use it for widespread dissemination. The information on successful experiences of using ISFM is scattered and needs building on. For instance, the experience of using participatory learning and action research (PLAR) in organizations such as the Kenyan Agricultural Research Institute (KARI) would be useful to identify farm-level factors constraining use of ISFM technologies (Odera et al., 2007).

Farmers face a whole range of problems related to soil fertility (Table 5) causing food insecurity, and these are compounded by low prices for agricultural produce. These problems are related to lack of access to appropriate technologies and information to counter the effects of climate change, and build resilience. The issues mentioned in Table 5 clearly show the systemic issues that indicate that soil fertility is embedded in ecological and socio-economic systems that are evolving over time with new challenges and opportunities. By intervening at soil fertility level, FGI could strengthen the resilience of the system as a whole.

Table 5. Summary of farmers' key livelihood related issues on soil fertility (Source: Interviews with key informants).

	Technological aspects	Organizational aspects	Institutional aspects
Farmer's livelihood related issues	<ul style="list-style-type: none"> - Land degradation at farm and landscape levels - Change in cropping patterns due to climate change - Inadequate quantities of quality biomass - Changes soil properties over time - Low water productivity - Micro-nutrient deficiencies 	<ul style="list-style-type: none"> - Vulnerability to climate change leads to food insecurity and can benefit through ISFM initiatives - Farming systems becoming vulnerable to specialization with consequent loss of advantages offered by mixed system aspects - Change of the fallow system due to pressure on land 	<ul style="list-style-type: none"> - Poor price and market opportunities for food security crops; - Low incentive to use fertilizers and enhance productivity

Networks such as SOFECSA have established learning centres and farmer learning alliances, and community level platforms for information and knowledge exchange. Collaboration with ACT, FAO and seed and fertilizer companies to promote new extension approaches based on SOFECSA's Learning Centre concept which advocates for field-based farmer learning platforms to promote uptake of technologies as complicated as ISFM .

Fertilizers are expensive and farmers need assurance that their use will lead to good returns and profitability. They need appropriate formulations that can be applied in low doses so that they can afford them and avoid decreasing marginal returns. Moreover, African soils are locally heterogeneous and spatially variable and, hence, at short distances, entirely different fine-tuned and site-specific fertilizer compositions and doses may be required to achieve best performance (Voortman, 2013). Adjustment of fertilizer composition to local conditions is knowledge intensive in that it requires mapping information about different soil types and their nutrient content.

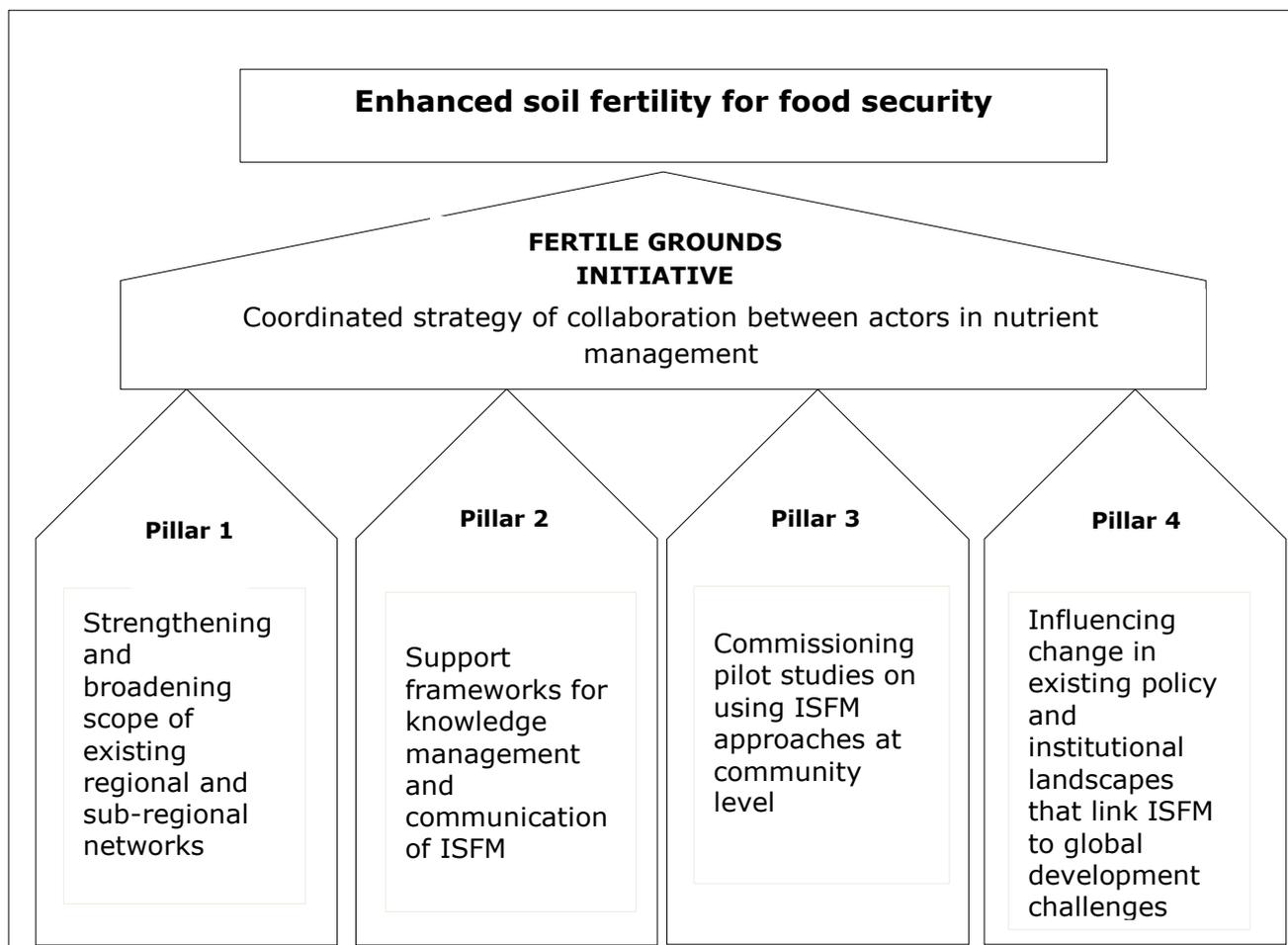
⁵ <http://africasoilhealth.cabi.org/> accessed 08/10/2014

4 Perspectives for FGI to engage with potential partners

Many of the respondents interviewed (Annex 3) felt that the FGI approach was relevant but “too early for Sub-Saharan Africa”. In their view the existing organizations and network were not yet ready to take the idea of nutrient exchange across scales, forward. Their concerns were linked to the practical aspects of implementing the FGI approach as in their view, the apparently straightforward ISFM solutions have also not been taken on board yet. For instance, an obvious solution would be increased use of biomass which is hindered by the present inefficiency of distribution systems. The scale of that loop has to be analysed. They felt that until the smaller loops in terms of nutrient management were closed, moving biomass and linking spatial scales through transport and conversion processes would be practically difficult to implement. They foresaw the following problems: a) high costs and logistics difficulties in transportation of the material across locations; b) limited quantity of organic material available: Small farmers do not have enough manure to exchange, and fertilizers and organic manure is primarily used by the resource rich farmers; and c) even after closing the nutrient cycle, over time, there will be reduction in the overall nutrient content in organic matter.

Nonetheless, in view of creating the ‘readiness’ for the FGI approach, the interviews pointed to a range of possibilities that could contribute to areas with limited soil fertility and nutrient availability. These viewpoints have been summarized in Figure 1 below.

Figure 1. Perspectives for FGI to engage with different players in SSA\



4.1 Strengthening and broadening scope of existing national consortia, regional and sub-regional networks

Most networks have active participation of NARES, NGOs, private companies (seed, fertilizer, agricultural marketing) and farmer associations or organizations in several countries in East and Central Africa. However, most of them are presently anchored with different host organizations, and they require support to make them more autonomous and their work more evidence based. With the help of other Dutch actors involved in soil fertility management, FGI could play a role in backstopping them to develop operational frameworks to link with regional economic institutes and gain recognition as sources of knowledge-based evidence for best practices, and also as implementing partners.

Of the networks mentioned in Table 1, SWMNet and SOFECSA offer potential entry points for rallying with diverse partners. SWMNet has been able to get the NARS in the 10 ASARECA member countries to work together (SWMNet, 2007). They had also formed a policy roundtable that included ministers or permanent secretaries from Kenya, Lesotho, Mozambique, Rwanda and Zambia. SOFECSA has been involved in promoting ISFM innovations through a) identification and prioritization of regionally relevant research and development issues; b) setting up inter disciplinary country teams to facilitate farmer participatory research, c) setting up learning centres and adaptive trials that integrate national priorities, and d) development of innovation platforms. As a network with membership spanning international, national and regional public and private organizations, including agricultural ministries of SADC countries, as well as working directly with farmers, SOFECSA is well positioned to provide FGI the platform required to influence agriculture policymakers. However, consolidating the institutional arrangements and functional capabilities of SOFECSA will require relatively more strengthening as compared to the networks historically operational in East and West Africa.

The AGRA-SHP supports national consortia in East and West Africa that aim to align the several actors engaged with ISFM and soil fertility in general. These consortia provide a “platform for knowledge integration and exchange between institutions and individuals working on different agricultural programs related to ISFM”⁶. The AGRA-SHP could be a useful partner for FGI to influence national policies that can regulate and stimulate the facilitation of the use of nutrients.

4.2 Developing and/or supporting frameworks for knowledge management and communication of ISFM

This area of collaboration focuses on providing technical and institutional support for adaptation and/or tailoring of ISFM interventions at different spatial levels in specific agro-ecological systems. It entails support for developing training and extension materials and capacity for advocacy, training and extension services by drawing upon the wealth of knowledge and evidence generated over the years by diverse organizations, researchers and networks. In this context, FGI could partner with on-going major programs and projects.

⁶ <http://soilhealthconsortia.org/the-strategy>

ASHC project has generated content and have produced crop specific materials covering print, audio-visual and radio formats in several languages for use by local extension departments at farm and field levels. Partnering with this project that has recently been awarded bridge funding to develop a second phase of ASHC⁷, could provide FGI access to an ISFM-ready farmer constituency to whom the new approach could be extended.

Another organization FGI could consider working with is IFDC in offering along both the soil nutrients input chain and the agricultural outputs value chain. For example, IFDC's Virtual Fertilizer Research Center (VFRC) engages professionals from various fields, such as nutrition, chemistry, biology and finance, to make innovative fertilizer ideas a reality⁸.

4.3 Commissioning pilots on using ISFM approaches at community level

Social and economic factors are critical in understanding patterns of soil fertility management in different contexts, over time and from one farmer to another. Farmers are key actors in the cycling of nutrients and are also an important source of information and knowledge regarding local soils and crop performance. Prices for land and crops have implications for investment in improving land, and therefore also for the form and efficiency of farm-level nutrient cycling (Scoones, 1999). It might be useful for FGI to partner with NGOs and/or CSOs and/or organizations such as CARE International who are implementing a community-based integrated soil-water conservation and livestock management project funded by the EU in Zimbabwe. Africare is partnering with AGRA in Ghana to conduct participatory outreach programs through media and is producing audio and video materials to document ISFM promotion activities and their benefits for wider distribution. They have linked local farmers organizations with financial institutions to secure agribusiness loans. Bringing the selected network together, will provide a mega consortia that can embrace the diverse agro-ecological, socio-economic and livelihood systems across Africa's major sub-regions. Both institutional models and the materials will need testing and participatory evaluation with communities and diverse actors. The Global Soil Partnership (GSP) initiated by FAO's Land and Water Division to develop regional soil partnerships, plans to focus on identification of gaps at either continental or regional scale and ii) to be an honest broker of best soil management practices. Their launch report⁹ provides a detailed analysis of the current status, need and priorities in Eastern and Southern African region, and an overview of regional soil management issues and initiatives. FGI could explore working together with some of their actionable areas under the regional soil partnership aimed at contributing to country level needs to strengthen and fill the gaps of the current soil initiatives.

The integrated agricultural productivity improvement project co-funded by the Achmea Foundation and implemented by Agriterra in Burudi is an example of a Dutch public-private consortium worth emulating in regions and countries where FGI scientists have receptive partners.

⁷ <http://africasoilhealth.cabi.org/2014/10/25/ashc-gets-green-light-to-develop-phase-2/>

⁸ http://www.ifdc.org/media_center/ifdc-perspectives/october-2014/listen-to-the-farmer/ accessed 30/11/2014

⁹ http://www.fao.org/fileadmin/user_upload/GSP/docs/Berlin/Launch_Report.pdf accessed 28/10/2014

4.4 Building new partnerships and changing policy and institutional landscapes that link ISFM to global development challenges

With emerging empirical evidence of the link between ISFM and climate change adaptation, there is a need to advocate for inclusion of ISFM as an option to adapt to climate change. There is a need to create a policy space for introduction of ISFM to regional economic communities for agro-ecology based intensification and as a ‘climate smart option’. In this endeavour, the Global Agenda for Sustainable Livestock seems to be a logical partner for FGI. One of their main focus areas is improved manure management in order to recover nutrients and energy, leading to economic and environmental benefits across different production systems, countries and policy environments. The focus area programme plans to “develop planning tools and catalyse the implementation of regulatory and incentive frameworks to support viable manure management and opportunities for recycling.”¹⁰ The programme is in the process of preparing a global inventory on manure production and management, and set up for knowledge exchange, outreach and capacity building mechanisms, and provide specific analytical support to the less affluent countries.

4.5 Engaging with private sector

The collaborative project of IFDC and USAID, Feed the Future- Agriculture Technology Transfer project (FTF-ATT) in Ghana,¹¹ is a good example of involving the private sector to increase the availability and use of agricultural technologies to improve and sustain productivity. The key elements of the project are increased capacity of the private sector to develop and disseminate improved seed and ISFM technologies; and increased efficiency and transparency of government functions to support seed, fertilizer and ISFM technology development, release and dissemination; and increased efficiency of targeted agricultural research to develop, release and communicate technologies that support sustainable agricultural productivity. IFDC is assisting private sector stakeholders to advocate for increased investment in ISFM research and enabling government policies and services including: increased attention and more focused research regarding soil fertility issues; inspection and quality control of soil fertility, seed and other technological products; and targeted agricultural extension. It might be worthwhile for FGI to study the nature of IFDC’s engagement with the private sector in this project, and explore possibilities of piloting the new approach as part of their endeavour to develop and disseminate ISFM based technologies.

The International Fertilizer Industry Association (IFA)¹² is the only international association for the global fertilizer industry. Its regional body for Africa, the Africa Forum, has both a pan-African and Sub-Saharan target and is composed of IFA members with a long-term interest in Africa and in developing fertilizer use to improve soil fertility, promoting agricultural production and human nutrition to alleviate poverty. The Forum provides a platform to exchange views and facilitates effective communication between the fertilizer

¹⁰ <http://www.livestockdialogue.org/focus-areas/waste-to-worth/en/> accessed 27/10/2014

¹¹ http://www.ifdc.org/projects/current2/north_west_africa/ftf-usaid-att/articles/ifdc-and-partners-begin-ftf-usaid-att-project-in-g/ accessed 28/10/2014

¹² <http://www.fertilizer.org> accessed on 28/10/2014

industry and key African stakeholders. FGI could explore if this platform is useful to share its approach and garner support (and feedback) from the fertilizer industry.

Another organization worth mentioning is the African Fertilizer and Agribusiness Partnership (AFAP), an independent non-profit organization created under the auspices of the Comprehensive Africa Agriculture Development Programme (CAADP). AFAP works with the public and private sectors to invest in fertilizer markets to make fertilizer accessible and affordable for African smallholder farmers, and foster responsible fertilizer use to increase crop yields and decrease food insecurity. It's activities are responsive to changing needs of a region, market or agribusiness.

5 Conclusions and recommendations

FGI is advocating a new, integrated approach to solve the problem of disconnected nutrient flows and discrepancy between organic and mineral as an umbrella approach aligning existing short and long term interventions carried out so far. The approach entails actions at different spatial levels. An ideal partner for FGI would be an entity that has a constituency at the national and sub-national levels and also the track record to influence policy at the continent and at global levels. It might be difficult to find one single organization or network that is effective at all levels. However, there are existing open networks that can be strengthened to serve the desired purpose of FGI. Collaborating with multi-country projects like ASHC or AGRA-SHP might also be another option, but most projects have time bound funding support, and limited mandate. Promoting a new approach will need consistent advocacy efforts that require time to bring about systemic changes.

Secondly, from the reactions of the different actors to the proposed solution of nutrient exchange and trading, it is apparent that the FGI would first need to invest time and effort to address some of the actors' immediate areas of concern. In other words this means that addressing the four pillars is a precondition for FGI to create readiness for acceptance and implementation of its approach. Of the four pillars, Pillars 1 and 4 entail advocacy solutions, and therefore given FGI's current competencies, they will require partners to convert these pillars into action. Pillar 2 refers to supporting existing networks such as SOFECSA in knowledge management to consolidate the evidence generated on the ground so far, and use that to create knowledge products for use in advocacy as well as extension for promoting context-specific solutions. FGI requires more applied research opportunities to create interest and support within Africa. It could approach the Food & Business Knowledge Platform for advice required to link up with Food & Business research grants such as ARF, which can deal with common themes related to soil fertility or with relevant other research initiatives (e.g. WOTRO commissioned studies on the effect of non-soil elements on soil fertility). Table 6 below suggests potential partners for each recommended pillar, and content and activities the partnership could initially focus on in view of addressing the four pillars.

Table 6. Potential partners in Africa and possible areas for partnerships to focus on.

Pillars	Potential partners	Partnership to initially focus on
1.Strengthening and broadening scope of existing regional and sub-regional networks	SOFECSA; ACT; FANRPAN	Institutional development, technical backstopping and funding to bring together the expertise, knowledge and meta-networks available with each of these networks.
2.Support frameworks for knowledge management and communication of ISFM	SOFECSA, ASARECA, CRS	This Pillar will draw on the wealth of knowledge and evidence on ISFM generated over the years by diverse institutions, individual researchers and networks to develop training and extension materials, support for tailoring of ISFM technical materials to generate context-specific solutions at the field, farm and landscape levels within specific agro-ecologies
Pillars	Potential partners	Partnership to initially focus on -
3. Commissioning pilot studies on using ISFM approaches at community level	ASARECA, ACT, CRS, CARE SOFECSA, AGRA-SHP	Mega consortia that can embrace the diverse agro-ecological, socio-economic and livelihood systems across Africa , and provide space for testing alternative technical and institutional approaches with communities and diverse actors.
4. Influencing change in existing policy and institutional landscapes that link ISFM to global development	ASARECA FANRPAN SOFECSA	Development of operational frameworks to link with regional economic organizations and create a policy space to advocate for inclusion of ISFM as an option for addressing climate change.

Although the examples of collaborative projects with the private sector focus on contributing to increased fertilizer use by African farmers, initiatives such as CATALIST 1 and 2 funded by the Dutch government (DGIS) using market as the key driver for agricultural intensification in the Central Africa Great Lakes Region (CAGLR) are promising examples of how to link with the private sector where national and international agro -enterprises in areas such as agro-input supply, professional service provision and output marketing are working together.

The inventory provided in this study could be used a basis to further develop a more specific work plan specifying which pillar to start with. In terms of where to begin, FGI could consider Ethiopia with the CASCAPE project; Burundi where Dutch funded PPP initiatives are currently ongoing could be another probable site to start with.

In conclusion, before FGI can embark on partnerships to promote the new approach, consolidation of all available evidence is needed to substantiate FGI's claim that nutrient based approaches are the most effective way forward to sustainably enhance soil fertility. The next step is to create the conditions for FGI to promote the approach by strengthening and broadening the scope of existing networks and organizations including NGOs and farmer organizations; and simultaneously explore the possibility of collaborating with private sector initiatives that are presently engaged in promoting fertiliser use for productivity enhancement.

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Annex 2: Websites accessed

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AfSIS: <http://www.africasoils.net/>

AGRA-SHP: <http://agra-alliance.org/what-we-do/policy-across-the-agricultural-value-chain/>

AGRA-SSTP: <http://agra-alliance.org/what-we-do/program-for-africas-seed-systems/>

ASARECA-SWMNet:

<http://www.asareca.org/swmnet/home.php?LinkID=0c3c8322b833376d737f14a98a77d998>

ASHC: <http://africasoilhealth.cabi.org/>

CASCADE: www.cascade.info

CORAF: <http://www.coraf.org/index.php/en/>

FANRPAN: <http://www.fanrpan.org/>

FARA: <http://faraafrica.org/>

CCDARESA: <http://www.worldbank.org/projects/P113629/caadp4-agricultural-research-program-cardesa-trust-fund?lang=en>

N2Africa: <http://www.n2africa.org/>

PanAAC: <http://www.panaac.org/>

Annex 3: Fertile Ground Initiative

The Fertile Grounds Initiative: A new way to close nutrient flows at regional level resulting in better agricultural productivity and less environmental losses

Background

The threat of declining soil fertility levels is well known. Yet, and despite numerous efforts, we seem incapable of changing the current situation of sink areas in developed countries and depletion areas in developing countries. With negative consequences (i.e. loss in productive capacity and loss in environmental quality) in both areas.

A new time, a new approach

Due to globalization and urbanization nutrient flows become increasingly disconnected, while at the same time more actors are involved in reallocation of nutrients, especially in the energy and waste sector. Time has come for a new approach to bring together demands and supplies for nutrients. We therefore present the Fertile Grounds Initiative: a broker for nutrient supply and demand in the region.

Guiding principles

The Fertile Grounds Initiative is based on the findings that:

- Organic and mineral nutrients are required for increased and sustainable production;
- Nutrients have a value and should be treated as such;
- Due to globalization and urbanization nutrient flows are ever more polarized between depletion and concentration areas;
- The demand for energy poses new threats and opportunities for nutrient management.

The Fertile Grounds Initiative

In the Fertile Grounds Initiative nutrient suppliers from the energy sector, waste management, fertilizer companies, etc. and demands for nutrients from farmers are brought together in a dynamic platform. This platform acts as a nutrient bank and integrates different sources of nutrients into high quality crop nutrition products. A capacity building programme ensures proper application of the nutrients and optimal use of on-farm nutrients.

Partners: ZOA, Alterra (Wageningen UR), soils & more, Ministry of Economic Affairs

Annex 4: Interview checklist

1. Name of actor
2. Type (Company, international organization, NGO, research, government organization, etc)
3. Level of operation – local/national/ regional/ global
4. Size of operations with regard to soil fertility, measured by
 - a) budget (R&D, CSR, total investment, annual budget)
 - b) clients (type and number)
 - c) employees (type and number)
 - d) Location/ geographic area covered
5. Sources of funding (private/market, PPP, public, donor)
6. Goals/ objectives/ mission statement
7. Nature of activities – commercial (private sector) / CSR / research/ training/ policy advocacy/...
8. Partners – private/ government/ NGOs/ donors
9. Impact/influence, measured through:
 - a) Publications - number/ type/ audience
 - b) # of clients / farmers
 - c) type, volume and value of products sold
 - d) investment made
 - e) other

Trends

10. What are the mayor developments with regard to soil fertility in the past few years you have noticed (if any)?
11. How do these developments affect your organization/company/ etc.?
12. Do you recognize some of the following trends?
 - a) Do you see a disconnection between research and the application of this research to the realities (i.e. variety in agro-ecological and socio-economic conditions)?
If yes:
 - Please elaborate
 - Does this need to be improved? If so, how?
 - What is your role in this and what contribution could FGI make?
 - b) How do you see the interconnection between climate change adaptation and ISFM?
If yes:
 - Please elaborate
 - Does this need to be improved? If so, how?
 - What is your role in this and what contribution could FGI make?

c) Which aspects of soil fertility do you believe are not sufficiently addressed?

- By who and how should they be addressed?
- What is your role in this and what contribution could FGI make?

If not mentioned by interviewee, ask about:

- micro nutrient deficiencies and fortification , as opposed to NPK based macro-nutrients only
- (examples of) integrated use of both chemical and biological fertilizers? Is it an issue that needs addressing? How?
- What is your view on fertilizer subsidy schemes (vouchers, free, loans)

Other

13. How could the FGI initiative contribute?
14. Should it be a platform for exchanging knowledge, Brokering PPPs, facilitate, research extension linkages, proper adoption through extension service, etc.? (link to problems mentioned before by interviewee).
15. How do you see that happening (SPECIFIC, EXAMPLES)?
16. What can go wrong? (duplication, bureaucracy, too vague/scientific, lobbies etc)?
Do you have examples of that?
17. How, in your view, do farmers decide to buy fertilizers or not and what kind of fertilizers?
18. Do you have any suggestions for contact persons (NGO, private sector, public, research etc.) that would be interesting sources for our study?

Additional Specific questions, determined by type of actor (optional):

- What is their vision for smallholder farmers (vs large scale)?
- What are the challenges they face while working with smallholder producers?
- What policy support do they need in order to address differential needs of smallholders?
- What mechanisms do governments have in place to support a context-specific approach to soil fertility management?

Annex 5: organizations contacted

Organization
AGRA
Yara International
IITA
IFAD
Wageningen University, ASHC, N2Africa
Africa Soil Health Consortium (ASHC)
UZ/SOFECSA
ACT Kenya/Tanzania
SOFESCA/UZ
CIMMYT
(KZN) SA
LUANAR Malawi
SOFECSA/Zimbabwe
IIAM (Mozambique)
IPNI
Windmill Fertilizer (Pvt) Ltd

Organizations contacted but not available/ did not respond

ATA Ethiopia
CIAT
EAFF
IFDC
IITA