Food and Agriculture Organization of the United Nations

GLOBAL SOIL PARTNERSHIP

Regional Implementation Plan for the African Soil Partnership

April 2016

Implementation Plan

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EXECUTIVE SUMMARY

Land, or soil, is the main resource base for many people in Sub-Saharan Africa, and is especially important for the rural population. With an estimated population growth for SSA from the current 900 million to 1.4 billion in 2030, the region's soils will experience increasing pressure as a natural resource to provide for the needs of its people. With an estimated 65% of arable lands, 30% of grazing land and 20% of forests already degraded in Africa, the region has the potential to position itself as champion in terms of increasing food production and security, achieving land restoration, and increasing agricultural resilience to climate change. Sustainable soil management is vital to achieving these goals and, for this reason, is one of the cornerstones of the Global Soil Partnership (GSP).

The African Soil Partnership caters for the Sub-Saharan Africa which includes 45 African countries. The AfSP Implementation Plan is based on regional priorities in terms of the Pillar recommendations in their respective Plans of Action. This document is the product of a collaborative effort, mostly via email, involving participants from the two sub-regional launch events, as well as later participants in digital soil mapping training, representatives from regional institutions involved as partners and, finally, national GSP focal points as nominated by the respective country representatives.

The main challenges associated with sustainable soil management in SSA were identified as:

- Inadequate capacity, knowledge and experience to plan and implement SSM and optimally manage, mitigate and monitor the productive and degradation status of the soils; especially under intensive cultivation.
- Where regional and national SSM policies exist, financing is often not a priority and/or implementation can be ineffective due to a lack of political will or a lack of implementation capacity. In many countries, policies regulating soil use are lacking.
- Soil information/data at national level is often inadequate, outdated, not in digital format and not georeferenced. Data availability is further restricted by intellectual property often held by private institutions that are not willing to share data for national use, or data needs to be paid for prior to use.
- Lack of national or umbrella organizations leading the campaign to promote and create awareness of SSM.
- Weak linkages between researchers, farmers and extension services to optimize information exchange.

Addressing these challenges and increasing SSM implementation encompasses various aspects that are crucial to its success. Under the five Pillars of the GSP, the various components of sustainable soil management can be addressed and managed to enable a holistic approach to improved soil management for long term soil protection while simultaneously providing for human livelihoods.

In SSA, crop production often occurs on already underperforming and poor quality soils using poor management practices and low use of external inputs. Over time, this leads to further decreases in soil quality, degradation of soil resources and resultant declines in food production and quality. The region's soils are especially vulnerable to degradation, especially in drier climates. During the launch workshop of the African Soil Partnership, most countries reported the occurrence of both chemical and physical soil degradation which leads to low soil productivity and yield gaps in many countries which in turn leads to food imports. The development of SSM solutions should not only consider the implementation environment, site specific characteristics and the necessary enabling environment, but also the causes of improper soil management to date in order to develop cause-driven rather than symptom-driven solutions.

This Implementation Plan sets out the road map for the next 5 years to achieve SSM over the longer term and includes a large number of outputs and activities which are considered priority in this first phase of establishing the AfSP. It is envisaged that funding for these activities will be secured by capitalizing on existing in-country initiatives and activities, as well as by actively sourcing additional external funding. Since the GSP is a voluntary initiative, it calls for the strong support of national governments, as well as national and regional entities involved in natural resource management to contribute to achieving the common goal of improved and sustainable soil management.

Under Pillar 1 (Promote sustainable management of soil resources and improved global governance for soil protection and sustainable productivity) the implementation plan proposes that soil degradation and restoration hotspots, as well as soil potential for agriculture be mapped for major agro-ecological zones. This will enable the identification of priority areas for SSM implementation to be initiated under this plan. A SSM implementation monitoring system is further proposed to measure success of SSM initiatives and monitor the status of the soil resources.

Under Pillar 2 (Encourage investment, technical cooperation, policy, education, awareness and extension in soil) it is proposed that SSM partner platforms be established to foster awareness and investment towards SSM implementation. To build soil science capacity, a regional tertiary soil science training exchange programme is proposed to increase the number of soil scientists trained at tertiary level. In addition, it is proposed that soil science education be included at secondary school level to educate learners from a young age about the importance of soil. The importance of soil extension services is highlighted, as well as the need for region-specific policy recommendations to support SSM development and implementation.

Pillar 3 (Promote targeted soil research and development focusing on identified gaps, priorities, and synergies with related productive, environmental, and social development actions) focuses on soil research for development. Under this Pillar it is proposed that an African Soil Research for Development Platform be established to bring soil research for development partners. Its main aim is to align efforts and resources towards improving the management of soil fertility and soil health, increasing productivity while protecting the soil resources and restoring productivity on degraded soils. This would include identifying soil-related research gaps and establishing regional research working groups to collaboratively address on these gaps.

Under Pillar 4 (Enhance the quantity and quality of soil data and information: data collection [generation], analysis, validation, reporting, monitoring and integration with other disciplines) addresses the need for soil data and information to support decision making and monitoring. The implementation plan proposes that an inventory be developed of all soil and related data in the region and an African soil database be developed and maintained. Training in digital soil mapping is proposed to increase soil mapping capacity in an effort to produce new and updated maps for the region.

Under Pillar 5 (Harmonisation of methods, measurements and indicators for the sustainable management and protection of soil resources) the implementation plan calls for the development of a harmonization procedure for soil classification and soil description. In addition, it proposes that regional reference laboratories be identified and supported to enable soil analysis towards increasing national and regional soil data.

Outcomes and activities are presented in separate log frames per Pillar, along with the associated budgets and time frames. Since the GSP is a voluntary initiative, it calls for the strong support of national governments, as well as national and regional entities involved in natural resource management to contribute to achieving the common goal of improved and sustainable soil management. The list of outputs may be considered optimistic, considering the 5-year timeline, but it is the view of the AfSP that these outputs are essential to moving forward towards achieving SSM in the region over the longer term. The aim of this implementation plan is therefore to solicit buy-in, support and active participation from additional partners to increase collaboration in soil management activities.

LIST OF ACRONYMS

AFAP	African Fertilizer and Agribusiness Partnership
AfSIS	Africa Soil Information Service
AfSP	African Soil Partnership
AGRA	Alliance for a Green Revolution in Africa
ASSS	African Soil Science Society
AU	African Union
CAADP	Comprehensive Africa Agriculture Development Programme
CBD	Convention on Biological Diversity
CGIAR	Consultative Group on International Agricultural Research
COMESA	Common Market for Eastern & Southern Africa
DSM	Digital soil mapping
EAC	East African Community
ECCAS	Economic Community of Central African States
ECOWAS	Economic Community of West African States
ESASP	Eastern and Southern Africa Soil Partnership
FAO	Food and Agriculture Organization of the United Nations
FERTASA	Fertilizer Association of Southern Africa
GEF	Global Environmental Facility
GM	Global Mechanism
GSP	Global Soil Partnership
ICARDA	International Center for Agricultural Research in the Dry Areas
ICBA	International Center for Biosaline Agriculture
ICT	Information and communications technology
IFAD	International Fund for Agricultural Development
IGAD	Intergovernmental Authority on Development
IITA	International Institute of Tropical Agriculture
ISFM	Integrated soil fertility management

ISO	International Organization for Standardization
ISRIC	International Soil Reference and Information Centre
IUCN	International Union for Conservation of Nature
IUSS	International Union of Soil Sciences
IYS	International Year of Soils 2015
JRC	Joint Research Center
LADA	Land Degradation Assessment in Drylands
NARS	National agricultural research system
NGO	Non-governmental organization
PTF	Pedotransfer functions
PTR	Pedotransfer rules
R4D	Research for development
RCC	Regional Coordination Committee
RSP	Regional Soil Partnership
SLM	Sustainable land management
SSA	Sub-Saharan Africa
SSM	Sustainable soil management
TOR	Terms of reference
UNCCD	United Nations Convention to Combat Desertification
UNDP	United Nations Development Programme
UNEP	United Nations Environment Program
UNFCCC	United Nations Framework Convention on Climate Change
USAID	United States Agency for International Development
USD	United States Dollars
WCASP	Western and Central Africa Soil Partnership
WG	Working group
WOCAT	World Overview of Conservation Approaches and Technologies

I. INTRODUCTION

Land, or soil, is the main resource base for many people in Sub-Saharan Africa, and is especially important for the rural population. With an estimated population growth for SSA from the current 900 million to 1.4 billion in 2030[1], the region's soils will experience increasing pressure as a natural resource to provide for the needs of its people. With an estimated 65% of arable lands, 30% of grazing land and 20% of forests already degraded in Africa[2], the region has the potential to position itself as champion in terms of increasing food production and security, achieving land restoration, and increasing agricultural resilience to climate change. Sustainable soil management is vital to achieving these goals and, for this reason, is one of the cornerstones of the Global Soil Partnership (GSP).

1 Establishing the African Soil Partnership

The African Soil Partnership (AfSP) was launched during two sub-regional workshops. The Western and Central Africa Soil Partnership (WCASP) was launched in Accra, Ghana during February 2013, and the Eastern and Southern Africa Soil Partnership (ESASP) during March 2013 in Nairobi, Kenya. The launches were attended by a total of 43 national institutions and sub-regional Communiqués were prepared to report on the establishment of the sub-regional soil partnerships and express the urgent need to promote the sustainable management of soils.

Six main areas of action were listed as priority in sub-Saharan Africa (SSA):

- Addressing soil degradation as a major factor in food insecurity and making country and region-wide efforts to rehabilitate degraded lands and change them to productive assets through community participation (Relates to Pillar 1).
- Guiding and enabling the implementation of sound and sustainable soil management practices and the restoration of soil health at all levels towards food security (Relates to Pillar 1).
- Developing, updating and disseminating updated and harmonized national and regional soil resource information addressing all user needs including soil fertility information and making the best use of science available to increase soil productivity (Relates to Pillars 4 and 5).
- Addressing climate change and developing resilience towards climate change adaptation (Relates to Pillars 1 and 3).
- Developing and implementing training and capacity building programmes in all soil applications for existing and new generations of experts in soil science and land management, taking into account the gender balance (Relates to Pillar 2).
- Establishing linkages and networks with other national, regional and global initiatives that impact soil health (Relates to Pillars 1 and 2).

The African Soil Partnership consists of the following sub-Saharan countries:

[1]World Population Prospects: The 2012 Revision, Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat, 2012.
[2]Agriculture for Impact. 2014. No ordinary matter: Conserving, restoring and enhancing Africa's soils. Montpellier Panel Report. December 2014.

Western and Central Africa:

Benin, Burkina Faso, Cameroon, Cape Verde, Central African Republic, Chad, Congo (Brazzaville), Congo (Democratic Republic), Cote d'Ivoire, Equatorial Guinea, Gabon, Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Mauritania, Niger, Nigeria, Senegal, Sierra Leone, Togo.

Eastern and Southern Africa:

Angola, Botswana, Burundi, Djibouti, Eritrea, Ethiopia, Kenya, Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, Rwanda, Somalia, South Africa, South Sudan, Swaziland, Tanzania, Uganda, Zambia, and Zimbabwe.

The AfSP Implementation Plan is based on regional priorities in terms of the Pillar recommendations in their respective Plans of Action. Although a Plan of Action for Pillar 3 was not yet formally endorsed by the GSP Plenary Assembly at the onset of this Implementation Plan, actions for this Pillar are listed based on known priorities and research needs.

This document is the product of a collaborative effort, mostly via email, involving participants from the two sub-regional launch events, as well as later participants in digital soil mapping training, representatives from regional institutions involved as partners and, finally, national GSP focal points as nominated by the respective country representatives. A draft document was developed from the main regional challenges and priorities in the region under each Pillar and its respective recommendations. The most urgent priorities were converted into actions to develop a draft Implementation Plan in May 2015 according to the *Guidelines to Develop Regional Implementation Plans (RIPs) by the Regional Soil Partnerships* provided by the GSP Secretariat.

During the AfSP Workshop held in Accra, Ghana, from 20 to 22 May 2015, participants (mostly national GSP Focal Points and representatives from regional institutions) divided into Working Groups per GSP Pillar on a voluntary basis and elected their respective chairs. The role of the Working Groups was to actively work on the Implementation Plan per Pillar during the workshop and thereafter to ensure its finalization.

An African Soil Partnership Steering Committee and Chair were also elected during this workshop to provide strategic direction to the AfSP over a two-year term. The Working Groups per Pillar and the first Steering Committee members are listed in Annexes 1 and 2 respectively. For administrative support, the role of AfSP Secretariat will be taken up by the FAO regional office in Accra, Ghana.

The GSP and its regional partnerships is an interactive, responsive and voluntary partnership which is open to governments, institutions and other stakeholders at various levels and the implementation of this Plan envisages the involvement of all its partners. Partners may include any form of international, regional and national institutions/organizations working on soils such as governmental organizations, universities, civil institutions, research centers, soil science societies, United Nations agencies, non-governmental organizations, private companies, farmer associations, donors and more. Default partners to the GSP are the FAO member countries who determine FAO's priorities as laid out in the Strategic Framework and Programme of Work and Budget of the Organization and according to the needs and priorities identified in their countries.

2 Main challenges in SSA

The main challenges associated with sustainable soil management in SSA were identified as follows:

- Inadequate capacity, knowledge and experience to plan and implement SSM and optimally manage, mitigate and monitor the productive and degradation status of the soils; especially under intensive cultivation.
- Where regional and national SSM policies exist, financing is often not a priority and/or implementation can be ineffective due to a lack of political will or a lack of implementation capacity. In many countries, policies regulating soil use are lacking.
- Soil information/data at national level is often inadequate, outdated, not in digital format and not georeferenced. Data availability is further restricted by intellectual property often held by private institutions that are not willing to share data for national use, or data needs to be paid for prior to use.
- Lack of national or umbrella organizations leading the campaign to promote and create awareness of SSM.
- Weak linkages between researchers, farmers and extension services to optimize information exchange.

Based on the opinion of national GSP representatives, the order of importance of the GSP Pillars of Action for implementation in SSA are:

1. Pillar 1: Promote sustainable management of soil resources for soil protection, conservation and sustainable production.
2. Pillar 4: Enhance the quantity and quality of soil data and information: data collection (generation), analysis, validation, reporting, monitoring and integration with other disciplines.
3. Pillar 3: Promote targeted soil research and development focusing on identified gaps, priorities, and synergies with related productive, environmental, and social development actions.
4. Pillar 2: Encourage investment, technical cooperation, policy, education, awareness and extension in soil.
5. Pillar 5: Harmonisation of methods, measurements and indicators for the sustainable management and protection of soil resources.

II. IMPLEMENTATION OUTPUTS AND ACTIONS PER PILLAR

Sustainable soil management is not a standalone concept and encompasses various aspects that are crucial to its effective implementation and success. This is understood within the Global Soil Partnership and formed the foundation for the development of the five Pillars of Action. Through these five Pillars, the various components of sustainable soil management can be addressed and managed to enable a holistic approach to improved soil management for long term protection of the natural resource while simultaneously providing for human livelihoods.

In SSA, crop production often occurs on already underperforming and poor quality soils using poor management practices and low use of external inputs such as quality seeds and fertilizers. Over time, this leads to further decreases in soil quality, (further) degradation of soil resources and resultant declines in food production and quality.[3] The region's soils are especially vulnerable to degradation, especially in drier climates,[4] which in turn increases the vulnerability of food production and security, as well as the long term sustainability of soil as a natural resource. During the launch workshop of the African Soil Partnership[5], most countries reported the occurrence of both chemical and physical soil degradation. Chemically, the main degradation types were reported as fertility and organic matter decline, with low external inputs of both fertilizers and organic matter, salinization/alkalization and acidification. This leads to low soil productivity and yield gaps in many countries which in turn leads to food imports. Physically, both water and wind erosion were presented as the main degradation types leading to large losses in topsoil, while in some countries compaction leads to reduced production potential.

The development of SSM solutions should not only consider the implementation environment, site specific characteristics and the necessary enabling environment, but also the causes of improper soil management to date in order to develop cause-driven rather than symptom-driven solutions. The main causes of soil degradation in SSA were identified as slash and burn practices, deforestation, overgrazing, conventional tillage practices (including monoculture production) which is aggravated by insufficient knowledge and capacity amongst farmers to implement sustainable management practices, and insufficient financial means to acquire external inputs such as improved seeds and fertilizers. From an enabling environment perspective, the insufficient use of soil and water conservation measures is further hampered by inadequate policies and regulations on SSM, insufficient investment and governmental support to implement existing guidelines, limited technical capacity and knowledge amongst farmers and advisors alike on SSM practices, as well as insufficient soil data and maps relevant to SSM decision making and implementation.

This Implementation Plan sets out the road map for the next 5 years to achieve SSM over the longer term and includes a large number of outputs and activities which are considered priority in this first phase of establishing the AfSP. It is envisaged that funding for these activities will be secured by capitalizing on existing in-country initiatives and activities, as well as by actively sourcing additional external funding. Since the GSP is a voluntary initiative, it calls for the strong support of national governments, as well as national and regional entities involved in natural resource management to contribute to achieving the common goal of improved and sustainable soil management. The list of outputs may be considered optimistic, considering the 5-year timeline, but it is the view of the AfSP that these outputs are essential to moving forward towards achieving SSM in the region over the longer term and the aim of this implementation plan is to solicit buy-in, support and active participation from additional partners to increase collaboration in soil management activities.

[3]Diagana, B. (2013). Land Degradation in SubSaharan Africa: What Explains the Widespread Adoption of Unsustainable Farming Practices? Draft working paper, Department of Agricultural Economics and Economics, Montana State University, Bozeman, MT, USA.
[4]Nachtergaele, F., Biancalani, R. and Petri, M. 2008 Land degradation. SOLAW Background Thematic Report 3. Rome.
[5]GSP. 2016.Report on the African Soil Partnership Workshop. 20-22 May 2015. Coconut Grove Hotel, Elmina, Ghana.

1. Pillar 1: Promote sustainable management of soil resources for soil protection, conservation and sustainable productivity

Soil protection and sustainable management is especially important in SSA where a large portion of the population, especially the rural population, depend on land as the main resource base for their livelihoods.[6] The combination of population growth, climate change and land degradation creates substantive sustainable development challenges in the region, especially in agriculture. With an estimated 180 million people being affected by land degradation in SSA and subsequent economic losses of USD68 billion per year[7], promotion of SSM is essential to protecting the region's soils towards improved human livelihoods and economic development. Agricultural production in SSA depends largely on smallholder farmers, which is already a vulnerable group with little available resources which creates additional challenges in the promotion of SSM.

1.1. Maps of soil degradation and restoration hotspots for major agro-ecological zones and potential for agriculture

Although it is known that land and soil degradation is wide spread in SSA, estimates of the extent and severity of the different types of soil degradation vary between different sources and based on methods of estimation. In order to successfully address soil degradation, its current extent and causes need to be determined, along with areas where soil restoration and SSM is successfully implemented. In addition, to aid decision making on land use and land use changes, information is needed on the agro-ecological potential and possibilities for restoring productivity of degraded land, opportunities for sustainable intensification on non-degraded lands, and land and soil suitability for agricultural and non-agricultural uses to ensure optimal use of soil resources in a given area. These estimates will form the basis for decision making to determine priority areas for soil conservation, SSM implementation, and areas where successful SSM implementation can be expanded, especially in areas under smallholder agriculture.

1.2. SSM implementation monitoring system

A monitoring system is needed to measure progress with the implementation of SSM practices and to monitor the status of the soil resources to determine whether efforts are successful and investments have been effective in improving soil quality and preventing and/or reversing land degradation. This will be done using relevant indicators (to be developed under this Outcome) to measure aspects of soil health and quality to be measured over time. The evaluation will be done by comparing indicator values to baseline values and/or by analyzing trends.

Monitoring will occur at regional level in conjunction with Pillar 4 which will monitor soil status in the region, but will also monitor implementation of activities under this Implementation Plan in terms of the number of activities implemented and achieved, as well as their success rates. This will entail monitoring at project, national and regional level and would necessitate the establishment of baselines for project implementation, as well as local, national and regional baselines. At local (i.e. project or

[6]UNEP (2005) Mapping indicators of poverty in West Africa. UNEP/GRID-Arendal, Norway

[7]Agriculture for Impact (2014) No ordinary matter: Conserving, restoring and enhancing Africa's soils. Montpellier Panel Report. December 2014

smallholder farm) level, simple toolboxes will be used for monitoring and evaluation purposes. Existing toolboxes such as Monitoring for Quality (MonQi) will be considered and adapted where necessary, and/or new toolboxes developed based on local needs and priorities.

The measuring of baseline values will occur in conjunction with Outcome 1.1 as much as possible, utilizing data generated through land degradation and SSM mapping. However, since relevant indicators need to be agreed upon, this Outcome will further entail the generation of new data where it is not currently available. In SSA there is generally little new soil data being generated, so a systematic programme or campaign will be developed to regularly collect soil data, again in conjunction with Pillar 4, at the level of agro-ecological zones. The data to be collected will be on functional soil properties and site characteristics that will allow assessing and monitoring the functions of the soil systems and suitability for particular uses. This would systematically contribute to increasing the amount of soil data in the region, as well as increase the amount of baseline data for monitoring purposes. Such data collection will occur systematically and continuously over time, based on the rate of change of chosen indicators.

1.3. SSM Implementation Projects Established

There are many successful SSM implementation projects in SSA which can be out-scaled and up-scaled for greater impact. Such projects need to be evaluated to determine their success factors which should be used in the development of future projects, as well as to further improve existing initiatives. This will include cost-benefit analyses, estimates of social return on investment for land users and impact on land degradation and ecosystem services. In addition, priority areas for new SSM projects will be identified towards increasing the area of soils under SSM in the region, project proposals developed and subsequent projects implemented and monitored.

Pillar 1: Promote sustainable management of soil resources for soil protection, conservation and sustainable productivity.

Outcome/Activity	Product Description	Activity No.	Activity Description	Priority (1, 2, 3)	Execution period (start-end) [8]	Stakeholders	Funding requirement (YES/NO and amount USD)
1.1 Soil degradation and restoration hotspots, and potential for agriculture mapped for major agro-ecological zones	Assess and document the following for major agro-ecological zones and land use systems: • Soil degradation status and trends • Soil potential for agriculture • Soil restoration potential • Existing SSM practices Using existing data and tools and ensuring the participation of all relevant stakeholders. Include assessment of biophysical and socio-economic benefits of SSM.	1.1.1	Identify all relevant data sources and institutions where data is hosted, including fertilizer companies, soil science societies and relevant initiatives and platforms.[9]	1	Jun 2016-Dec 2016	Governments, especially their relevant ministries (i.e. agriculture, water, environment, etc.) GSP Focal points and partners, FAO, research and academic institutions and networks, private sector International and regional organizations where applicable[10]	USD20,000[11] National Contribution
		1.1.2	Identify key role players to be involved in LD and SSM assessment.	1	Jun 2016-Dec 2016		USD5,000 National Contribution
		1.1.3	Identify and map soil degradation (including types, status, trends, main direct and indirect causes) and existing SSM practices in SSA within major agro ecological zones and land use systems.	1	Jan 2017–Dec 2019		USD400,000 National Contribution
		1.1.4	Determine the soil potential for agriculture in major agro-ecological zones/countries. This assessment will utilize existing information and supplement it with the generation of new information in countries where it is not yet available.	1	Jan 2017-Dec 2019		USD200,000 National Contribution

[8] Execution periods are estimated, assuming that funding is available for activities to start as indicated.
[9] This Activity overlaps with Activity 4.1.1 in terms of identifying soil data, but will also include developing an inventory for data on land degradation, soil restoration and the implementation of SSM practices.
[10] AFAP, AGRA, CAADP, CGIAR, FAO, GEF, ICARDA, ICBA, IFAD, IITA, ISRIC, IUSS, JRC, LADA, WOCAT, etc.
[11] This budget is additional to the USD100,000 budgeted under Activity 4.1.1 to cater for the additional data to be inventoried.

		1.1.5	Assess soil potential for non-agricultural land use systems.	2	Jan 2017-Dec 2019		USD100,000 National Contribution
1.2 Monitoring system for soil and land degradation, as well as SSM implementation[12]	Develop a monitoring system to assess soil and land degradation and measure progress of SSM practices and systems implementation	1.2.1	A task team will develop or adopt existing soil and land degradation indicators, as well as SSM and related indicators to be used as monitoring proxies[13]. Indicators are to be developed via e-consultation and finalized during a task team workshop.	1	Sep 2016-Jun 2017	Relevant government ministries, research and academic institutions	USD100,000 National Contribution
		1.2.2	Put in place a systematic programme/campaign for collecting soil data (mobile labs, soil test kits, or other); develop ICT tools for effective data collection and management.[14]	1	Jul 2017 onwards		USD250,000 National Contribution
		1.2.3	Assess the regional baseline values of the set indicators from which to start measurement.[15]	1	Jul 2017-Dec 2019		USD100,000 National Contribution
		1.2.4	Development/adoption and implementation of simple toolboxes for monitoring and evaluating smallholder farms, for example, MonQi (Monitoring for quality improvement) toolbox.	2	Jan 2017–Dec 2018		USD100,000 National Contribution
1.3 SSM implementation	Upscale proved SSM practices	1.3.1	Evaluation of successful SSM practices to determine success factors for out- and up-scaling.	1	Jan 2017-Dec 2018	Relevant government ministries, GSP	USD50,000

[12]This monitoring system will form part of the soil status monitoring system to be developed under Pillar 4, Outcome 4.7.
[13]This activity overlaps with Activities 4.6.1. and 5.1.2. Each activity has its own budget to cater for the specific deliverables to be developed.
[14] To be implemented in conjunction with Activity 4.6.2. Each activity has its own budget to cater for the specific deliverables to be developed.
[15] To be done concurrently with Outcome 1.1 as much as possible, especially Activity 1.1.4.

projects established						partners, FAO, soil institutions, farmers, private sector International and regional organizations where applicable[16]	National Contribution
		1.3.2	Identify priority areas for implementing and/or upscaling SSM and develop subsequent projects for potential funding and implementation.[17]		Jan 2018-Dec 2019		USD20,000 National Contribution
		1.3.3	Implementation of SSM projects.		Jan 2019 onwards		USD22,500,000 for the first 3 years (USD500,000 per country) National Contribution
Subtotal for Pillar 1							**USD23,845,000**

[16] AFAP, AGRA, CAADP, CGIAR, FAO, GEF, ICARDA, ICBA, IFAD, IITA, ISRIC, IUSS, JRC, LADA, WOCAT, etc.
[17] Identifying priority areas for SSM implementation will coincide with Activity 1.1.3.

2 Pillar 2: Encourage investment, technical cooperation, policy, education, awareness and extension in soil

SSM awareness raising and lobbying will be applied to drive local governments to create or reinforce policies on SSM. Investment and policies on SSM are the backbone to the successful implementation of SSM. Training in soil science and related fields must start at an early school age and a relevant and dynamic curriculum is important at higher education level which should link with extension services. The celebration of World Soil Day (WSD) is a step forward to such initiatives, however many other national and regional platforms are required to put SSM on the developmental agenda. The awareness campaign on healthy soils must carry relevant messages to different stakeholders through improved communication and training materials using various channels, including multimedia.

2.1 Sustainable Soil Management partner platforms, awareness and investment promoted

Existing barriers to sustainable soil management at national level are compounded by the critical gaps and overlaps in institutional responsibilities, and arrangements to foster co-management and participatory approaches need to be clearly defined. An institutional framework is required to resolve the problems of coordination and collaboration among agencies on environmental management issues. This will help partners to mainstream SSM activities and their associated programmes.

There is also a general lack of awareness amongst a wide range of stakeholders (i.e. policy makers, government departments, implementers, land users and the general public) about the importance and functions of soil as natural resource in SSA and the need for its protection and sustainable use for long term benefit. Increased awareness on these issues is therefore imperative at all stakeholder levels (i.e. land user, implementation, decision maker and political levels) to foster an understanding of the need for SSM. Development of SSM material at regional level which can be adapted to national level needs will enhance public debate and can create a platform to influence decision makers and politicians. National Soil Science Societies, regional young soil scientist networks and the African Soil Science Society (ASSS) are seen as strong platforms to sensitize and interact with various stakeholders and for lobbying and advocacy with policy makers in terms of SSM. At Regional level, the ASSS website needs revitalization for active information sharing on SSM activities and programmes in SSA.

The use of incentives to encourage governments and funders to invest in soils (subsidy, credit, markets) plays an important role in the promotion of SSM/SLM implementation. SSM action plans should reflect an integrated investment framework (IIF) and financial support should be secured from existing and new international, regional and national organizations.

2.2 Regional tertiary soil science training exchange programme

There is a general lack of sufficient technical soil science capacity in SSA as identified by several countries during the AfSP launch workshop. Training and awareness starts from an early age and inclusion of soil science in the primary and secondary school curriculum is important to educate learners from a young age. In many tertiary institutions, soil science is not available as primary discipline, nor has it been integrated into agriculture and other environmental science programmes or courses. This extends further to an insufficient number of African universities offering post-graduate degrees in soil science and related fields. The result is a shortage of especially young soil scientists.

In order to facilitate an increase in soil science education, an assessment of existing curricula at primary and tertiary level is needed to identify needs to update/review or develop new soil curricula and/or programmes responsive to changing demands. An increase in institutions which present soil science programmes will certainly contribute to providing a new generation of soil scientists who can follow and participate in the implementation of soil related projects and participate in the current job market.

2.3 Information package for soil extension services

Extension services play a vital role in SSM support at land user level, and provide the crucial link between researchers and farmers. Extension personnel need to be better equipped in terms of SSM knowledge and information to provide optimal services to land users. The Soil Doctors Programme is recommended for use as extension tool on SSM, especially in areas where extension services are not currently active. In addition, the development of regional soil information for extension services should be developed which can be adapted to national needs to assist in the establishment and strengthening of extension services.

A closer working relationship is needed between research, extension and soil users to facilitate the transfer of knowledge, information and SSM support. The use of multimedia information would contribute to foster such a closer working relationship.

2.4 Region-specific policy recommendations

More efficient policy regulation of soil management and associated aspects is needed to increase and support SSM implementation. To achieve this, harmonized regional policies are needed on agricultural inputs of fertilizer, seed, agro-chemicals, agricultural implements and agricultural products in order to support national agricultural policies. As a first step, the Abuja Declaration on Fertilizer for an African Green Revolution (2006) needs to be reviewed and governmental commitment to its implementation and achievements should be renewed.

Regional guidelines of communication with policy makers can facilitate the development of relevant national information which would highlight the importance of soil as natural resource and the need for its protection and sustainable management. Scientific style communication does not speak to policy maker priorities, so scientific information should be repackaged for maximum impact on decision makers. The inclusion of skilled communicators in this process would therefore greatly contribute to bridging the information gap between science and policy.

Pillar 2: Encourage investment, technical cooperation, policy, education, awareness and extension in soil.							
Outcome/Activity	**Product Description**	**Activity No.**	**Activity Description**	**Priority (1, 2, 3)**	**Execution period (start-end)** [18]	**Stakeholders**	**Funding requirement (USD)**
2.1 SSM partner platform, awareness and investment promoted	Sustainable Soil Management partner platform is created and awareness and investment is promoted	2.1.1	Identify and empower soil advocacy groups at national and regional levels that will endorse the Sustainable Development and Post 2015 agenda.	1	Jan 2017- Dec 2019	Governments, especially their relevant ministries (i.e. agriculture, water, environment, etc.) GSP focal points and partners, FAO, research and academic institutions and networks, private sector, National and regional soil science platforms, NGOs	USD100,000
		2.1.2	Develop soil awareness material at regional level which can be adapted to national level needs. Create awareness through extension services, farmer field schools, and by mainstreaming SSM activities and programmes.	1	Sep 2016- Dec 2020		USD50,000 to develop regional awareness material USD450,000 to support awareness creation at national level
		2.1.3	Sensitize all relevant stakeholders (land users, natural resource managers and decision makers) on the importance of soil as natural resource and the need for its conservation and sustainable management.	1	Sep 2016 onwards		USD50,000 National Contribution

[18] Execution periods are estimated, assuming that funding is available for activities to start as indicated.

		2.1.4	Lobby and advocate for policy makers to increase policy support for SSM implementation by establishing Soil Science Caucuses in the Parliament of each country (following the example in the USA).	2	Sep 2016 onwards	International and regional organizations where applicable[19]	USD50,000 National Contribution
		2.1.5	Foster increased investment by public and private sectors in sustainable soil management.	2	Jan 2017 onwards		National Contribution
		2.1.6	Increase technical cooperation between various institutions and initiatives in the implementation of SSM by increasing information sharing on current activities.	2	Jan 2017 onwards		National Contribution
		2.1.7	GSP Focal point institutions should be encouraged to include WSD in the annual activity programme and get support from local FAO representation for implementation of activities.	1	Jun 2016 onwards		
		2.1.8	Update and maintain the African Soil Science Society website and create a link to the GSP website.	2	Sep 2016 onwards	Website manager, ASSS	USD20,000
2.2 Regional soil science training and exchange programme	Build soil science capacity at primary, secondary and tertiary levels by promoting the inclusion of soil science training in schools and tertiary institutions.	2.2.1	Lobby for the inclusion of soil science as a topic in primary and secondary education and the inclusion of soil scientists in the development of relevant school curricula.	2	Jan 2017-Dec 2019	Ministries of education, national soil science platforms, focal points, research and academic institutions, schools	USD50,000

[19] AFAP, AGRA, CAADP, CGIAR, FAO, GEF, ICARDA, ICBA, IFAD, IITA, ISRIC, IUSS, JRC, LADA, WOCAT, etc.

		2.2.2	Develop a regional exchange programme for tertiary soil science training, along with an associated bursary scheme. Creation of incentive (i.e. scholarship awards) for students to pursue graduate studies in soil science and related fields and conduct innovative research.	2	Sept 2016-Dec 2018	Ministries of education, national soil science platforms, focal points, universities, research institutions, private and public sectors International and regional organizations where applicable[20]	USD40,000[21]
		2.2.3	Train MSc and PhD students and technicians in SSM and related fields through the established exchange programme and bursary scheme.	3	Jan 2018 onwards		USD200,000 for 10 MSc students per year USD350,000 for 10 PhD students per year USD50,000 for 10 soil technicians per year
		2.2.4	Assessment of soil curricula at tertiary level to identify curricula in need of updating/review.	3	Sep 2016-Dec 2018	National soil science platforms, universities	USD20,000

[20] AFAP, AfSIS, AGRA, CAADP, CGIAR, FAO, GEF, ICARDA, ICBA, IFAD, IITA, ISRIC, IUSS, JRC, LADA, WOCAT, etc.
[21] This budget is for the development of the exchange programme only. The cost of the exchange programme is given under Activity 2.3.3. as cost per student.

2.3 Information package for soil extension services	Strengthen existing soil extension services and promote the establishment of such services where they do not currently exist. Repackage soil information for extension programmes for ease of use and promotion of SSM	2.3.1	The extension service of the Department in charge of soil related issues, universities and research institutions to jointly establish the Soil Doctors Program with land users as the main target.	3	Jan 2017-Dec 2019	Relevant government ministries, focal points, national soil science platforms, universities, partners, extension services	USD500,000 for initial implementation in 5 countries National contribution
		2.3.2	Countries need to identify or establish relevant institutions/departments to lead soil extension programmes, where these do not exist.	3	Sep 2016-Dec 2019	Relevant government ministries, national and regional soil science platforms, national and regional soil science societies, research and academic institutions, extension services	National contribution
		2.3.3	Develop material and information to enhance soil extension services at regional level which can be adapted to national level needs.	3	Jan 2017-Dec 2019		USD100,000
		2.3.4	Foster closer working relationships between research, extension and soil users.	3	Jan 2017-Dec 2019		National contribution

2.4 Region-specific policy recommendations	Propose region-specific policies and strategies that countries can adopt	2.4.1	Harmonize policies on input: fertilizer, seed, agro-chemicals, agricultural implements and agricultural products.	1	Jun 2016-Dec 2020	African Union and sub-regional equivalents, national governments, relevant regional and national associations[22]	USD500,000[23]
		2.4.2	Review the Abuja Declaration and renew governmental commitment to its implementation and achievement.	1	Jun 2016-Jul 2016	African Union and sub-regional equivalents, national governments	USD200,000
		2.4.3	Develop regional guidelines of communication with policy makers which should be nationally adapted. This should be done in collaboration with skilled communicators to assist soil scientists with guidelines on how to communicate technical information to a political audience.	3	Jan 2017-Dec 2018	National governments, regional and national soil science platforms, ASSS, FAO, communication specialists	USD20,000
Subtotal							**USD2,750,000**

[22] E.g. AFAP, COMESA, EAC, ECCAS, ECOWAS, FERTASA, IGAD and others.
[23] This budget would support task teams to work on the various policy aspects, stakeholder engagements and workshops.

3 Pillar 3: Promote targeted soil research and development focusing on identified gaps, priorities, and synergies with related productive, environmental, and social development actions.

In general, Pillar 3 aims to stimulate the implementation of targeted soil research as a response to emerging demands from the soil users and practitioners who on a daily basis face constraints and challenges for implementing sustainable soil management practices and for increasing soil productivity. This should lead to a strategic combination of basic and applied research to generate knowledge for the development of new or improved technologies, for supporting development agendas, economic growth, environmental sustainability and social development. However, such a strategy may vary from one region to another. Within the AfSP, targeted soil research activities should include intelligence work directed to identify and prioritize research gaps, and boost engagement and collaboration as well as impact through adaptability and dissemination strategies of produced knowledge and technologies.

Unsustainable soil management practices have resulted in soil degradation and nutrient depletion, which are now considered one of the main constraints towards improving agricultural productivity. Soil degradation is one of the major constraints towards achieving increased agricultural productivity, resulting in declining per capita food production in SSA. With respect to increasing population densities, it is argued that more than proper soil management will be required to sustain food security in the region. Restoring productivity of degraded soils is therefore imperative to increasing food production. Much research has been done on how to sustainably increase productivity and, to some extent, on restoring productivity in degraded soils, but this has not led to concrete and practical solutions that can be implemented at large scale on smallholder farms in SSA. To fill such gaps, research is needed to develop technical solutions for problems related to soil fertility that address demands for increasing productivity within local, national and regional contexts. In addition, this research should address concerns about sustainability and environmental services in SSA in order to inform and convince non-soil experts.

To remain in line with the recommendations of the GSP, targeted soil research within the AfSP should thus focus on: (i) the evidence of the value of soils and soils research to society, (ii) the support actions of the four other pillars towards economic, environmental and social development, (iii) the regular intelligence on current and emerging global, regional and local Soils R&D priorities, and (iv) the synergy and engagement between research and end-user communities. Four main actions are now identified to be tackled within the timeframe of this implementation plan. These are: (i) establishing an African Soil Research for Development platform, (ii) creating and maintaining an AfSP research website, (iii) identifying soil-related research gaps at landscape level, and (iv) establishing functional regional research working groups. Detailed descriptions of each action and related activities are provided below.

3.1 African Soil Research for Development Platform

The African Soil Research for Development platform aims to bring soil research for development partners together to align efforts and resources towards improving the management of soil fertility and soil health, increasing productivity while protecting the soil resources and restoring productivity on degraded soils. The platform provides a mechanism through which soil research for development partners can engage and through which a more coherent and coordinated approach towards sustainable soil management can be achieved. The platform aims to make better use of soil and agronomic data to be able to provide location specific and evidence-based recommendations for integrated soil fertility management. The platform places a strong emphasis on nutrient management (balanced crop nutrition) and additional integrated soil fertility management practices to improve nutrient use efficiency and agronomic efficiency of fertilizer use. This is based on the assumption that balanced crop nutrition and efficient use of fertilizers will prevent nutrient depletion and reduce nutrient losses with subsequent benefits to the environment. The solution lies partly in the development of appropriate fertilizers. The platform aims to address this by developing the data and information products that guide the development of such fertilizers. This should include gathering information on current soil degradation and fertility status. Being able to link soil and agronomic data is important for this purpose and the platform will facilitate the sharing of this data and information and promote open access to the data and information sources. The platform will further conduct and facilitate the analysis of the data and synthesis of results from various research projects to provide recommendations on what needs to be done to restore productivity on degraded soils towards increasing and sustaining yields on more responsive soils. The platform will also be able to identify data and information gaps and direct research towards development of new integrated soil fertility management (ISFM) technologies and products, as well as to improve data collection to close the data and information gaps. Lastly the platform will work on the development of indicators that will allow the monitoring of progress towards sustainable intensification of African stallholder production on the basis of the adoption of sustainable integrated soil fertility management practices. The activities of the platform are strongly linked (and contribute) to the implementation plans for Pillar 1, to promote sustainable management of soil resources, will feed in to the various platforms and working groups planned for Pillars 2 and 3 and will contribute to Pillar 4 and Pillar 5 activities aiming to improve the quantity and quality of soil data and information and the indicators for the sustainable management of soil resources by including agronomic data rather than concentrating on soil data *per se*.

Activities to be carried out under this Outcome are: creating an inventory of the existing platforms at regional and international levels; developing an inventory of data and information products on and identification of information and knowledge gaps; consultations on research priorities and setting the agenda for a targeted research agenda; defining the research framework and a framework for data and information sharing, as well for the analysis and synthesis of such information; identifying the different stakeholders of the platforms; defining the terms of reference (TOR) of the platforms; and linking with existing platforms in soil science societies in Africa.

3.2 List of soil-related research gaps presented in an R4D research website

Targeted soil research should be based on existing soil-related research gaps. To develop such a list of research gaps, base line data needs to be assessed at national level, to elaborate and report on the status of the regional soil resources, facilitated through a series of national and regional workshops. This will be done in conjunction with Outcomes 1.1 and 1.2 under Pillar 1.

In order to engage all potential actors to develop relevant strategies, invest resources and execute complementary actions towards reaching the R4D objectives (i.e. close gaps in knowledge, generate or improve technologies to solve problems, and support human development) within the region, a website is foreseen as one of the main tools for information exchange. This action will include designing the R4D web page, presenting information on soil status and research gaps and translating research outcomes into informative messages to all the stakeholders and the larger public.

3.3 Regional research working groups

Since research gaps and strategies may vary from one area to another, there is a need to stratify and group actors by soil-related discipline and by landscapes and/or agro-ecological zones in order to increase their capability and impacts for regional economic growth, environmental sustainability and social development. In order to achieve this action, activities to be carried out will include the following: identifying priority themes for working groups as based on the list of identified soil-related research gaps, developing the TOR for each working group including a procedure of nomination of group members, and organizing a regional workshop to share the TOR and to set up the different working groups.

Pillar 3: Promote targeted soil research and development focusing on identified gaps, priorities, and synergies with related productive, environmental, and social development actions.							
Outcome/Activity	**Product Description**	**Activity No.**	**Activity Description**	**Priority (1, 2, 3)**	**Execution period (start-end)** [24]	**Stakeholders**	**Funding requirement (YES/NO and amount USD)**
3.1 African Soil Research for Development Platforms	Establish African Soil Research for Development Platforms	3.1.1	Inventory of existing soil research platforms at regional and international levels.	1	Jun 2016-Dec 2016	Focal points, regional and national research and academic institutions	No FAO Africa Regional Office to provide information
		3.1.2	Hold consultative sub-regional workshops to define and establish the platforms: Determine aims and objectives, mode of operations and organization, roles of the platforms in implementing activities 3.2 and 3.3 in this implementation plan, define their TOR and list the different stakeholders of the various platforms.	1	Jan 2017-Dec 2017	AfSP Secretariat, focal points, regional and national research and academic institutions, soil science societies	USD150,000 for three (3) regional consultative meetings/ workshops
		3.1.3	Linking and embedding the R4D[25] platforms in existing regional and sub-regional structures and soil science societies in SSA.	2	Jun 2017-Dec 2018		USD10,000 to visit relevant regional bodies
3.2 List of soil-related	Assess and prioritize soil-related research gaps and	3.2.1	Design a R4D website/page.	1	Jun 2016-Dec 2017	GSP Secretariat, webmaster	USD5,000

[24] Execution periods are estimated, assuming that funding is available for activities to start as indicated.
[25] R4D = Research for Development

research gaps presented in an R4D research website	present them in an R4D website/page	3.2.2	Produce information on soil status and soil research gaps through workshops and consultancy with national focal points.[26]		Jun 2016-Dec 2019	National governments, soil science societies, research and academic institutions, focal points, private sector	USD200,000
		3.2.3	Elaborate and report the status of the regional soil resources on the R4D website.		Jun 2017 onwards		USD100,000
		3.2.4	Adapt and translate the scientific message to inform all stakeholders and the larger public.		Jun 2017 onwards	Research and academic institutions, focal points, professional communicators	USD50,000
3.3 Regional research working groups	Set up regional working groups for specific research themes with clear TORs	3.3.1	Identify priority themes working groups based on research gaps identified in Outcome 3.2.		Jan 2017-Dec 2018	Research and academic institutions, focal points, AfSP Secretariat and Steering Committee	National and regional contribution An electronic forum will be used.
		3.3.2	Develop the TOR for each working group with a procedure of nomination of researchers and institutions.		Jun 2017-May 2018		
		3.3.3	Share the TOR with different country members.		Jun 2018	AfSP Secretariat	NO
		3.3.4	Organize regional workshops to set up the different working groups.		Jun 2018-Dec 2018	GSP Secretariat, AfSP Secretariat, research theme working groups	USD100,000
Subtotal Pillar 3							**USD615,000**

[26] This activity will overlap with Outcomes 1.1 and 1.2 under Pillar 1.

4 Pillar 4: Enhance the quantity and quality of soil data and information: data collection (generation), analysis, validation, reporting, monitoring and integration with other disciplines

Reliable soil information has become fundamental to inform decision making from land user to research and policy levels to guide soil use and management, especially in the face of the increased need for climate change adaptation and mitigation, sustainable intensification of agriculture and the provision of ecosystem services.[27] Implementation and monitoring of SSM further requires reliable soil information to evaluate implementation impact and progress and determine how different soils respond to different management practices.

Soil data in SSA is generally considered insufficient and in many countries, existing soil data is outdated and/or only provide information at low resolution. Furthermore, existing data is often not openly available due to intellectual property (IP) rights, privacy issues or the need to pay for required data. Much of the existing data are in hard copies of maps, data tables and reports. In many cases, both hard and soft copy soil data are not georeferenced and therefore not suitable for use in mapping.

A systematic approach will be followed to assess what data and information exists and where, rescuing existing data where possible, identifying data gaps and filling such gaps by generating new data, followed by regular data updating. In order to enable data sharing and development of regional soil products, harmonization of data will be addressed. Implementation of these activities will be done in close collaboration with an International Network of Soil Information Institutions (INSII), especially SSA partners to this network. It is expected that many of these institutions are currently the custodians of a large portion of existing data and key stakeholders in the management and generation of soil data.

4.1 Compilation of soil data sources and soil mapping covariates

Inventories will be developed at national level to assess what soil data and information exists and where. The aim is to establish as complete as possible a list of all soil data sources, including where data is held and by whom, data availability and IP specifications, relevant metadata and the format of data (i.e. hard or soft copies of maps, tables and other forms of data, state of georeferencing, data scale, etc.). This compilation will be used to identify where and how existing data can be obtained and rescued (where necessary) and assess how much data actually exists. This will enable the identification of data gaps towards developing a strategy for data sharing and generation of new data.

Information sharing and collaboration will be strengthened through the INSII and relevant institutions will be encouraged to join this network and participate in the compilation of existing data sources. Effective communication will be key to keeping member institutions informed of all activities and progress, as well as opportunities for collaboration and participation.

[27] Omuto C, Nachtergaele F and Vargas Rojas R. 2013. State of the Art Report on Global and Regional Soil Information: Where are we? Where to go? Global Soil Partnership Technical Report. Food and Agriculture Organization of the United Nations, Rome

4.2 African soil database developed

Decision making at regional level requires regional data which is often obtained at national level. However, the current dispersive nature of soil data in SSA makes it difficult to obtain available data or know where data is available and how it can be obtained. A regional soil database would enable a collaborative effort to collect and manage soil data and increase data sharing between institutions and countries for research, decision making and monitoring purposes, while still respecting the rights and responsibilities of the data owners and custodians. Such a database would provide open source soil data and in an online format and put in place a system to support the acquisition of data which is not free. Appropriate structures will therefore be developed to address IP and data use concerns, as well as costs involved in obtaining relevant data. Where applicable, existing data will be rescued by digitizing hard copy maps and transferring hard copy data from tables and reports to electronic format. An online database of soil information will be established with appropriate specification for use.

4.3 Online interaction platform for DSM

The need for increased expertise and capacity in digital soil mapping (DSM) was identified during the launches of the sub-regional African Soil Partnerships in 2013. Initial training in DSM were held for both the Eastern and Southern Africa Soil Partnership and the Western and Central Africa Soil Partnership which was concluded in 2015. Training participants requested the development of an online interaction platform where DSM application and challenges can be discussed with both fellow trainees and DSM experts in an open discussion forum. The platform will be linked to the GSP website.

4.4 DSM training package

The DSM training provided by the GSP was a two-week course which included the theory of DSM and practical sessions. Although participants indicated that this training was beneficial, they identified the need for follow-up training, additional training for more people and training materials that provide step-by-step guidelines to DSM. The need for DSM training will be assessed at national level and relevant DSM training materials developed which will be made available online through the GSP website. A capacity building and training programme will subsequently be developed to give more intensive training on DSM which would enable participants to develop DSM products in their respective countries. This training programme will include a dedicated and full time technical support system to assist trainees over the long term with any DSM related challenges.

4.5 Soil texture map for Africa

Besides the recently developed Soil Atlas of Africa (2013),[28] there are few recent maps for SSA representing soils and their characteristics. As a first step to develop new or updated regional soil maps, a first map will be developed as part of the DSM capacity building strategy and as a product of activities to collect and collate soil information in the region. Soil texture (clay %, ratios of sand:silt:clay) was chosen as mapping characteristic due to its importance as soil parameter which

[28] Jones A, Breuning-Madsen H, Brossard M, Dampha A, Deckers J, Dewitte O, Gallali T, Hallett S, Jones R, Kilasara M, Le Roux P, Micheli E, Montanarella L, Spaargaren O, Thiombiano L, Van Ranst E, Yemefack M, Zougmoré R, eds. 2013. Soil Atlas of Africa. Luxembourg: European Commission

affects various soil properties such as fertility, water infiltration and drainage, water holding capacity, susceptibility to erosion, ease of cultivation and others. It is believed that such maps would provide valuable basic soil information for the region and its development will simultaneously build capacity and lay the foundation for the development of additional soil maps for SSA.

The soil texture map will be based on existing soil data available in the region, as well as any new data generated during the implementation of this Plan. All relevant soil data from different sources will be harmonized based on analysis methods and parameters measured and used in a DSM environment along with legacy data to develop the soil texture map. A verification exercise will be done at national level to assess the levels of accuracy and uncertainty, as well as the priority areas for increased sampling to refine the map in future.

4.6 Updated soil database

Once the African soil database (Section 2.4.2) is established, it will need regular maintenance and updating as new information becomes available. Existing data will also need harmonization to enable data sharing and collective use for mapping purposes. Harmonization procedures will be developed for all data parameters based on analysis methods and parameters measured (as will be done for the production of the soil texture maps). A dedicated soil sampling and analysis programme will be established to systematically fill the gaps in existing data, as well as to enable the long term monitoring of soil properties.

4.7 Soil status monitoring system

The main objective of the Pillar 4 Plan of Action under the GSP is to establish a system, to be referred to as SoilSTAT, to monitor, forecast and periodically report on the status of the global soil resource. These priorities are equally important for SSA in the goal for the conservation and sustainable use of the region's soils. The SoilSTAT system will be developed globally with close collaboration between all regions, including SSA. In SSA this activity will be implemented in overlap with Pillar 1 (Outcome 1.2) to assess changes in the status of selected soil characteristics over time and simultaneously monitor the impact of SSM implementation, as well as the implementation of this Plan.

Pillar 4: Enhance the quantity and quality of soil data and information: data collection (generation), analysis, validation, reporting, monitoring and integration with other disciplines.							
Outcome/Activity	**Product Description**	**Activity No.**	**Activity Description**	**Priority (1, 2, 3)**	**Execution period (start-end)** [29]	**Stakeholders**	**Funding requirement (YES/NO and amount USD)**
4.1 Compilation of soil data sources and soil mapping covariates	Document soil data sources and soil mapping covariates	4.1.1	Develop national inventories of existing data and where data is held.[30]	1	Jun 2016-May 2017	National, regional and international soil information institutions, focal points, partners	USD100,000
		4.1.2	Analyze data availability and copyright.	2	Jun 2016-May 2017		USD10,000
		4.1.3	Develop metadata for all data sources.	2	Jun 2016-Jun 2017		USD20,000
		4.1.4	Collaborate with global P4WG on INSII establishment.	2	Dec 2016 onwards		National Contribution
		4.1.5	Inform member institutions of INSII activities.	1	Jan 2017 onwards		National Contribution
4.2 African soil database developed	Develop a distributed soil database for SSA[31]	4.2.1	Establish structures for IP and data use.	3	Jan 2017-Dec 2018		USD20,000
		4.2.2	Develop a network of technical institutions of soil information.	4			National Contribution
		4.2.3	Rescue data and develop an online database.	5			USD500,000
4.3 Online interaction platform for DSM	Develop online interaction platform for DSM	4.3.1	Develop an online interaction platform for DSM discussion and link with GSP website.	6	Jun-Dec 2016	GSP and AfSP Secretariats	USD50,000
4.4 DSM training package	DSM training and capacity building	4.4.1	Conduct a training needs assessment at national level.	7	Jan 2017 onwards	GSP Secretariat, national, soil	USD50,000
		4.4.2	Develop DSM training materials.	8			USD50,000

[29] Execution periods are estimated, assuming that funding is available for activities to start as indicated.
[30] This Activity overlaps with Activity 1.1.1 in terms of identifying soil data and soil mapping covariates and should be implemented concurrently.
[31]Directly linked to Outcomes 4.1. and 5.4.

		4.4.3	DSM capacity building through online training and training workshops.	9		information institutions	USD200,000
		4.4.4	Develop and maintain a full time technical DSM support system.	10			USD100,000
4.5 Soil texture map for Africa	Produce a digital map of soil texture for SSA	4.5.1	Customize harmonized procedures for data relevant to soil texture in terms of soil analysis and soil parameters.[32]	11	Jan 2017-Dec 2019	GSP Secretariat, national, soil information institutions	USD20,000
		4.5.2	Develop soil texture maps.	12			USD150,000
		4.5.3	Verify the maps.	13			USD200,000
4.6 Updated soil database	Update the soil database developed under Outcome 4.2	4.6.1	Customize harmonized procedures for methods of soil analysis and soil parameters measured for all data in the African soil database.[33]	14	Sep 2016-Jun 2019	GSP Secretariat, national, soil information institutions	USD10,000
		4.6.2	Implementation of a soil sampling and analysis programme to supplement the soil database.[34]	15	Jul 2017 onwards		USD800,000
		4.6.3	Update soil database with newly generated data and information.	16			USD10,000
4.7 Soil status monitoring system[35]	Develop a monitoring system	4.7.1	Develop or adopt framework for monitoring soil status.	17	Jan 2017-Jun 2019	GSP Secretariat, national, soil information institutions	USD250,000
		4.7.2	Develop the SoilSTAT system.	18	Jan 2017-Dec 2020		USD300,000
Subtotal Pillar 4							**USD2,840,000**

[32] Forms part of Activity 4.6.1.
[33] To be implemented in conjunction with Activities 1.2.1 and 5.1.2. Each activity has its own budget to cater for the specific deliverables to be developed.
[34] To be implemented in conjunction with Activity 1.2.2. Each activity has its own budget to cater for the specific deliverables to be developed.
[35] Link with Outcome 1.2 to support monitoring of SSM implementation.

5 Pillar 5: Harmonisation of methods, measurements and indicators for the sustainable management and protection of soil resources.

Sustainable soil management is a regional goal, the same as land and soil degradation occurs in all countries and across borders. However, data collected to describe soil and represent its properties is generated using different techniques, analysis methods and scales of analysis which may give different information to illustrate a similar soil characteristic. Harmonization of methods and data is therefore necessary to enable data sharing and collation at regional level to support sustainable management and protection of soil resources. Harmonization will be done according to principles of cooperation and operations to ensure commonality, inclusiveness, efficiency, multi-linguistics, interoperability, extensibility and scalability. For soil analyses, harmonization can be promoted by using ISO certified reference laboratories identified in the region. Standards will be developed by examining existing practices for field sampling, preparation and measurement and will consider global standards to be developed under the GSP in order to enable the exchange of data with other regions.

Harmonization procedures for soil sampling, analysis methods and parameters measured will be developed under Pillar 4, Outcome 4.6, as part of the updating of the African soil database, while harmonization of soil description procedures will be implemented under Pillar 5. There will be synergy between these activities, however, to result in a complete regional set of harmonization procedures.

It should be noted that, since the GSP is a voluntary partnership, it is not envisaged that any institution or country will be forced to apply the developed standards of measurement and soil description. Rather, these standards will be available especially to institutions and countries that do not currently have their own standards of measurement and harmonization procedures will be used to harmonize legacy and new data which is available from different standards. In addition, the harmonization products are seen as standards as the central concept to which soil data and information are translated for regional exchange purposes.

5.1 Harmonization procedure for soil description

Some countries in SSA have their own soil description and classification systems, while others use internationally available systems. The GSP, in the Pillar 5 Plan of Action, recommends that, if no national guidelines are available, soil description be done according to the FAO (2006) Guidelines for Soil Description, but that an over-arching soil description system be designed to describe and explain soil features in a common and consistent manner. For soil classification it recommends the use of the World Reference Base for Soil Resources (WRB) or the USDA Soil Taxonomy, until a new standard system is released. It further supports the development of the new Universal Soil Classification System as over-arching classification system. Regional activities under this Pillar 5 will therefore be implemented in accordance with these recommendations.

Under this outcome, a common harmonization concept will be developed to translate all soil description and classification systems to regional standards (to be developed) which will, importantly, also feed into the global harmonization systems. Such a harmonization exercise will require dedicated time and effort. For this purpose, an 8-member committee will be established which will represent soil classification experts from the four sub-regions (Western, Central, Eastern and Southern Africa).

The Harmonization Committee will hold an initial 5-day meeting to discuss the process to be followed and delegate responsibilities. The process will be continued via electronic platform to develop a first draft of harmonization procedures, following which a second 5-day workshop will be held to develop a Zero draft which will be made available for review by AfSP partners and the GSP Secretariat. After the harmonization procedures have been finalized, the committee will meet once a year to assess its implementation and determine whether any adjustments are necessary.

5.2 Regional soil correlation events held

In the 1970s and 80s regular meetings were held by African Regional Sub-Committees for Soil Correlation and Land Evaluation to discuss the assessment of land resources for agricultural purposes. The AfSP would like to revive the hosting of soil correlation meetings and events to conduct quality checks on existing and new soil data generated under the partnership for mapping purposes and ensure efficient harmonization across data sources.

5.3 List of national, regional and international reference laboratories

During the AfSP launch workshop in 2015, many countries indicated their lack of well-equipped and/or ISO certified soil laboratories to provide for the national soil analytical needs. Such a lack of laboratories hampers the generation of new soil data or makes it a more expensive exercise if soil samples have to be sent away for analysis. It is envisaged that having at least one ISO certified reference laboratory is necessary per sub-region (West, Central, East and Southern Africa) to cater for sub-regional soil analysis needs.

Pillar 5: Harmonisation of methods, measurements and indicators for the sustainable management and protection of soil resources.							
Outcome/Activity	**Product Description**	**Activity No.**	**Activity Description**	**Priority (1, 2, 3)**	**Execution period (start-end)** [36]	**Stakeholders**	**Funding requirement (YES/NO and amount USD)**
5.1 Harmonization procedure for soil description	Develop a common harmonization concept for soil description and classification at regional level	5.1.1	GSP/FAO to set up an 8-member committee representing all the sub regions of relevant soil experts to implement activities under Pillar 5 in consultation with Pillar 5 working group.	1	Sep 2016 onwards	AFSP Secretariat, Pillar 5 Committee national soil institutions; regional soil classification experts; extension services	Year 1 Two 5-day meetings USD70,000 Year 2-Year 5 One 5-day meeting per year USD260,000 (USD65,000 per year for 4 years)
		5.1.2	Determine the different soil classification systems used per country and develop a common harmonization concept for soil description and classification at regional level to produce a step by step guide.[37] Include reference to analysis methods to enable the correlation of soil properties between different areas/regions. Integrate local level soil descriptions by scientists and farmers into national, regional and global levels.	1	Sep 2016-Jun 2018		USD100,000 National and regional contribution

[36] Execution periods are estimated, assuming that funding is available for activities to start as indicated.
[37] This activity overlaps with Activities 1.2.1 and 4.6.1. Each activity has its own budget to cater for the specific deliverables to be developed.

		5.1.3	Develop a list of common regional soil description parameters, indicating the most crucial soil properties to be described in every soil map.		Sep 2016-Jun 2018		USD20,000
		5.1.4	GSP/FAO to make available enough copies of soil description and classification guidelines e.g. the WRB, SOTER Manual, etc. for use by national soil institutions.	2	Sep 2016-Jun 2017		USD20,000
5.2 Regional soil correlation events held	GSP/FAO to revitalize the regional soil correlation events that used to be organized	5.2.1	GSP to facilitate development of bi-annual regional soil correlation and evaluation events.	2	Jan 2017-Dec 2020	GSP and AfSP Secretariats, national soil institutions	USD500,000
		5.2.2	Conduct quality checks on soil data sets from member states during the process of collection exercise for mapping purposes with the collaboration of Pillar 5 Working Group.	2	Jan 2017 onwards		USD50,000
		5.2.3	Soil Institutions in Africa to work in close liaison with the global soil information management committee and IUSS and ISO working groups.	3	Sep 2016 onwards		National Contribution
5.3 List of national and regional	Identify national and regional reference laboratories for training,	5.3.1	Develop an inventory of facilities and manpower capacities at national and regional reference laboratories.	4	Sep 2016-Dec 2017	Focal points, FAO Regional offices, national soil institutions	USD20,000

reference laboratories	soil analyses and sample exchange	5.3.2	ISO Certification of at least one soil laboratory per sub-region (West, Central, East and Southern Africa) (if not already certified) for purposes of standardization. Where necessary, this would include capacity building and training of personnel in the chosen standardized methods, and upgrading of equipment necessary to do the standardized measurements.	5	Jan 2017-Dec 2019	National soil institutions, soil laboratories, GSP Secretariat	USD1,500,000
		5.3.3	ISO certified soil laboratories in SSA to engage in the International Soil-analytical Exchange Programme to enable increased quality assurance.	6	Jan 2017 onwards		USD20,000
Subtotal Pillar 5							**USD2,560,000**

III. IMPLEMENTATION ARRANGEMENTS AND GOVERNANCE

Implementation of this plan will be governed within the GSP framework and terms of reference (TOR) with all the major stakeholders. The *Guidelines for the establishment and consolidation of Regional Soil Partnerships* regulates the interaction of stakeholders, along with the terms of reference for the GSP.

Implementation of this Plan will be coordinated by the AfSP Secretariat in close collaboration with the Steering Committee, and with strong support from the GSP Secretariat. All proposals for funding of activities developed by the AfSP will be channeled through the Healthy Soils Facility and verified by the GSP Secretariat prior to submission to potential donors.

Successful implementation, however, will further require dedicated action on the part of all regional and national level AfSP partners. In the Elmina Communique, participants of the African Soil Partnership launch workshop acknowledged existing contributions from governments, organizations, donors and initiatives in the field of sustainable soil management. They further called upon them to support the African Soil Partnership through collaboration and/or by joining as active partners to contribute to achieving sustainable management of the region's soil resources.

Participating regional and national institutions are listed in Annex 3, indicating their potential roles in implementation. However, now official commitments towards implementation have been made by these institutions.

IV. RISK MANAGEMENT

Successful implementation of this Plan assumes that the following is in place:

- Adequate and sustained funding to support implementation over a 5-year period;
- Sufficient in-kind and co-funding contributions from regional and national institutions and governments;
- Active participation by regional and national AfSP partners;
- Political will at government level to make SSM and its enabling environment a priority to be supported by appropriate policies; and

Funds for the implementation of this Plan will need to be mobilized in close collaboration with the GSP Secretariat. The Implementation Plan contains a large number of outputs and actions under the various Pillars and sets optimistic goals for the following 5-year period and it may be that, due to insufficient funding, not all outputs will be achieved. However, it was the view of the AfSP that all current priority outputs be listed for implementation in order to increase the variety of outputs to be funded. This would enable lobbying for funding with a wider donor group who may only fund certain types of activities.

Implementation of activities under the GSP as a voluntary partnership is strongly dependent on national contributions by partners and countries. Since listing of institutions in Annex 3 does not constitute official commitment to contribute financially to implementation, such contributions would have to be secured during the development of project proposals. As a key feature of the GSP is to ensure synergy between various institutions and activities, the aim is to build on existing networks and implementation activities to assist in securing national contributions.

Strong support from national focal points, the AfSP Steering Committee and Secretariat, as well as the GSP Secretariat will firstly be essential to the successful implementation of this Plan. In addition, other regional and national level partners and institutions need to be actively involved in activities the various activities. This would include collaboration in activities based on current projects and initiatives underway that would add to achieving the listed outputs, as well as participation in the development of new projects and implementation thereof.

During the launch of the AfSP many countries stated that the insufficient application of SSM was driven by inadequate policies and regulations to support SSM and insufficient investment and governmental support to implement existing guidelines.[38] It was also highlighted that there is often insufficient understanding at political level of the fundamental importance of soils as a natural resource in human well-being and the strong need for its protection and sustainable use. Increased political will and support for SSM initiatives will be imperative to the successful implementation of this Plan.

V. MONITORING AND EVALUATION

Overall progress on the implementation of this Plan will be assessed annually for reporting to the GSP Plenary Assembly, to be presented by the Steering Committee Chair. This assessment will be based on the number of activities initiated and progress in their implementation, as well as the number of proposal submitted to secure funding for implementation.

Progress on the implementation of SSM will be assessed using SMART (Simple, Measureable, Attributable, Reliable and Time bound) indicators to be developed as part of a monitoring and evaluation system under Pillar 1 of this Implementation Plan, overlapping with Pillars 4 and 5. For on the ground implementation, monitoring will be based on baseline values of the indicators at the start of implementation. Assessment will generally occur annually, but depending on the nature of individual indicators and their rate of change, some assessment periods may be adjusted accordingly.

[38]GSP. 2016. Report on the African Soil Partnership Workshop. 20 – 22 May 2015, Coconut Grove Hotel, Elmina, Ghana.

VI. BUDGET AND COMMITMENTS

The total budget is presented in Table 1, indicating the budget per GSP Pillar as captured in the Pillar log frames (in Section II of this document). The total budget is USD13,499,120 for a five-year period. Although external funding and support will be needed for most activities, it is anticipated that regional, national and local co-funding support will be obtained during implementation.

Table 1. Total budget

Resource envelopes by Pillar	**USD**
Pillar 1: Promote sustainable management of soil resources for soil protection, conservation and sustainable productivity	23,845,000
Pillar 2: Encourage investment, technical cooperation, policy, education, awareness and extension in soils	2,750,000
Pillar 3: Promote targeted soil research and development focusing on identified gaps and priorities and synergies with related productive, environmental and social development actions	615,000
Pillar 4: Enhance the quantity and quality of soil data and information: data collection (generation), analysis, validation, reporting, monitoring and integration with other disciplines	2,840,000
Pillar 5: Harmonization of methods, measurements and indicators for the sustainable management and protection of soil resources	2,560,000
Total Activities	**32,610,000**
Technical support services (FAO) ~10%	**3,261,000**
TSS to field projects	750,000
Reporting (standard cost)	10,000
Evaluation	75,000
Total value of goods and services	**36,706,000**
PSC 7%	**2,569,420**
Grand Total	**39,275,420**

ANNEX 1: Members of the GSP Pillar Working Groups and AfSP Steering Committee

GSP Pillar Working Groups

Pillar	Name	Country
Pillar 1	Zakayo Muyaka (Chair)	Uganda
	Klaas Mampholo	South Africa
	Kokou Kintche	Togo
	Mulugeta Abera	Ethiopia
	Abdou Rahman Jobe	The Gambia
	Musa Mkhonta	Swaziland
	Laurinda Nobela	Mozambique
	Mame Ndéné	Senegal
	Hami Said	Djibouti
	Jeroen Huising	Nigeria
	Enoch Boateng	Ghana
	James Banda	Malawi
Pillar 2	Botle Mapeshoane (Chair)	Lesotho
	Arlende Flore Ngomeni	Cameroon
	Jackson Nkuba	Tanzania
	Mamadou Traore	Burkina Faso
	Francis Tetteh	Ghana
Pillar 3	Martin Yemefack (Chair)	Cameroon
	Isaurinda Baptista Costa	Cape Verde
	Yves Anaclet Bagafou	Gabon
	Lunze Lubanga	Democratic Republic of Congo
	Jean Arsène Yamale	Central African Republic
	Addam Saidou	Niger
	Mohamed Egueh	Djibouti
Pillar 4	Christian Thine (Chair)	Kenya
	Nthatuoa Rantoa-Kuleila	Lesotho
	Enoch Boateng	Ghana
	Chebukani Mpapho Fanani	Botswana
	Stalin Sichinga	Zambia
	Aaron Marshall	Liberia
	Igué Attanda Mouinou	Benin
	Lorenzo Oyono Obama	Equatorial Guinea
	Diallo Aissatou Taran	Guinea
	Magdalena Hangula Sheeketela	Namibia
	Zacharia Gnankambary	Burkina Faso
Pillar 5	Vinod Lalljee (Chair)	Mauritius
	Victor Chude	Nigeria
	Sebastian Brahene	Ghana
	Marcelino Vaz	Guinea-Bissau

ANNEX 2: Members of the first AfSP Steering Committee

Committee consists of the following two representatives per geographic region and two Institutional members:

West Africa:	Mr. Victor Chude, Nigeria (**Chair**);	Mr. Igue A. Mouinou, Benin
East Africa:	Mr. Hami Said, Djibouti;	Mr. Vinod B. Lalljee, Mauritius
Central Africa:	Mr. Michel Naitormbaide, Chad;	Mr. Yves Bagafou, Gabon
Southern Africa:	Ms. Laurinda Nobela, Mozambique;	Mr. Chebukani Fanani, Botswana
Other Partners:	Mr. Martin Yemefack, African Soil Science Society;	
	Mr. E. Jeroen Huising, International Institute of Tropical Agriculture	

ANNEX 3: PARTICIPATING COUNTRIES, PARTNERS, AND MAIN CONTRIBUTIONS

<table>
<tr><th>Country</th><th>Organization</th><th>Associated Staff (specialization and positon)</th><th>General Contribution to the RSP</th></tr>
<tr><td rowspan="4">International organizations</td><td>FAO</td><td rowspan="17">GSP focal points, soil scientists, soil surveyors, remote sensing/GIS specialists, land management officers, water management officers/specialists, university lecturers, teachers, policy and decision makers</td><td rowspan="4">Encourage investment, technical support, international and regional cooperation and adoption of sustainable soil management practices. Contribute to processes of information and data collection where appropriate and contribute to creating an enabling environment where soil is recognized as key global natural resource in need of protection.</td></tr>
<tr><td>UNCCD, UNFCCC, CBD, UNDP, UNEP, GEF, GM</td></tr>
<tr><td>USAID, ICARDA, ICBA, IFAD, IGAD, IITA, ISRIC, IUSS, JRC</td></tr>
<tr><td>Other</td></tr>
<tr><td rowspan="3">Regional organizations</td><td>AU, AGRA, AFAP, CAADP, CGIAR, FERTASA and others</td><td rowspan="3">Provide regional support for AfSP implementation at political, research, implementation, economic and technical levels. Contribute to the harmonization of policies regulating soil use.</td></tr>
<tr><td>COMESA, EAC, ECCAS, ECOWAS</td></tr>
<tr><td>Other</td></tr>
<tr><td rowspan="4">International projects</td><td>LADA</td><td rowspan="4">Contribute to technical cooperation, education and soil information collection.</td></tr>
<tr><td>WOCAT</td></tr>
<tr><td>AfSIS</td></tr>
<tr><td>Other</td></tr>
<tr><td rowspan="7">National government</td><td>Ministry of Agriculture</td><td rowspan="7">Provide national support and co-funding for AfSP activities. Promote technical cooperation and policy support between ministries to enable SSM implementation and soil protection. Activate and support extension services to support soil users. Support increased soil education at secondary and tertiary levels. Promote and support technology transfer on SSM and related practices.</td></tr>
<tr><td>Ministry of Water Resources</td></tr>
<tr><td>Ministry of Environment</td></tr>
<tr><td>Ministry of Education</td></tr>
<tr><td>Ministry of Finance/Treasury</td></tr>
<tr><td>Ministry of Development</td></tr>
<tr><td>Other Ministries relating to soil and environmental concerns</td></tr>
</table>

Country	Organization	Associated Staff (specialization and positon)	General Contribution to the RSP
National institutions/ societies	Research institutions		Support increased soil education at secondary and tertiary levels. Contribute to soil curricula development at all levels where needed. Participate in the R4D platform and related activities. Contribute to data and information collection. Ensure integration of soil science subjects into related disciplines.
	Academic institutions		
	Schools		
	Soil science societies		
	Other		
Civil society	Farmers' associations		Support soil protection and SSM implementation by advocating sustainable practices and systems. Support soil monitoring. Influence media and contribute to awareness raising and lobbying for increased SSM and soil protection.
	NGOs		
	Private companies/institutions		
	Other		

ANNEX 4: PROPOSED TIMELINE FOR IMPLEMENTATION

Pillar and activities	Year 1			Year 2			Year 3			Year 4			Year 5		
	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
Pillar 1: Promote sustainable management of soil resources for soil protection, conservation and sustainable productivity.															
Outcome/Activity 1.1: Soil degradation and restoration hotspots, and potential for agriculture mapped for major agro-ecological zones															
1.1.1 Identify all relevant data sources and institutions where data is hosted, including fertilizer companies, soil science societies and relevant initiatives and platforms															
1.1.2 Identify key role players to be involved in LD and SSM assessment.															
1.1.3 Identify and map soil degradation (including types, status, trends, main direct and indirect causes) and existing SSM practices in SSA within major agro ecological zones and land use systems															
1.1.4 Determine the soil potential for agriculture in major agro-ecological zones/countries. This assessment will utilize existing information and supplement it with the generation of new information in countries where it is not yet available.															
1.1.5 Assess soil potential for non-agricultural land use systems.															
Outcome/Activity 1.2: Monitoring system for soil and land degradation, as well as SSM implementation															
1.2.1 A task team will develop or adopt existing soil and land degradation indicators, as well as SSM and related indicators to be used as monitoring proxies. Indicators are to be developed via e-consultation and finalized during a task team workshop.															
1.2.2 Put in place a systematic programme/campaign for collecting soil data (mobile labs, soil test kits, or other); develop ICT tools for effective data collection and management.															
1.2.3 Assess the regional baseline values of the set indicators from which to start measurement.															
1.2.4 Development/adoption and implementation of simple toolboxes for monitoring and evaluating smallholder farms, for example, MonQi (Monitoring for quality improvement) toolbox.															
Outcome/Activity 1.3: SSM implementation projects established															
1.3.1 Evaluation of successful SSM practices to determine success factors for out- and up-scaling.															
1.3.2 Identify priority areas for implementing and/or upscaling SSM and develop subsequent projects for potential funding and implementation.															
1.3.3 Implementation of SSM projects.															

Pillar and activities	Year 1			Year 2			Year 3			Year 4			Year 5		
	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
Pillar 2: Encourage investment, technical cooperation, policy, education, awareness and extension in soil.															
Outcome/Activity 2.1: SSM partner platform, awareness and investment promoted															
2.1.1 Identify and empower soil advocacy groups at national and regional levels that will endorse the Sustainable Development and Post 2015 agenda.															
2.1.2 Develop soil awareness material at regional level which can be adapted to national level needs. Create awareness through extension services, farmer field schools, and by mainstreaming SSM activities and programmes.															
2.1.3 Sensitize all relevant stakeholders (land users, natural resource managers and decision makers) on the importance of soil as natural resource and the need for its conservation and sustainable management.															
2.1.4 Lobby and advocate for policy makers to increase policy support for SSM implementation by establishing Soil Science Caucuses in the Parliament of each country (following the example in the USA).															
2.1.5 Foster increased investment by public and private sectors in sustainable soil management															
2.1.6 Increase technical cooperation between various institutions and initiatives in the implementation of SSM by increasing information sharing on current activities.															
2.1.7 GSP Focal point institutions should be encouraged to include WSD in the annual activity programme and get support from local FAO representation for implementation of activities.															
2.1.8 Update and maintain the African Soil Science Society website and create a link to the GSP website.															
Outcome/Activity 2.2: Regional soil science training and exchange programme															
2.2.1 Lobby for the inclusion of soil science as a topic in primary and secondary education and the inclusion of soil scientists in the development of relevant school curricula.															
2.2.2 Develop a regional exchange programme for tertiary soil science training, along with an associated bursary scheme. Creation of incentive (i.e. scholarship awards) for students to pursue graduate studies in soil science and related fields and conduct innovative research.															
2.2.3 Train MSc and PhD students and technicians in SSM and related fields through the established exchange programme and bursary scheme.															
2.2.4 Assessment of soil curricula at tertiary level to identify curricula in need of updating/review.															

Pillar and activities	Year 1			Year 2			Year 3			Year 4			Year 5		
	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
Outcome/Activity 2.3: Information package for soil extension services															
2.3.1 The extension service of the Department in charge of soil related issues, universities and research institutions to jointly establish the Soil Doctors Program with land users as the main target.															
2.3.2 Countries need to identify or establish relevant institutions/departments to lead soil extension programmes, where these do not exist.															
2.3.3 Develop material and information to enhance soil extension services at regional level which can be adapted to national level needs.															
2.3.4 Foster closer working relationships between research, extension and soil users.															
Outcome/Activity 2.4: Region-specific policy recommendations															
2.4.1 Harmonize policies on input: fertilizer, seed, agro-chemicals, agricultural implements and agricultural products															
2.4.2 Review the Abuja Declaration and renew governmental commitment to its implementation and achievement															
2.4.3 Develop regional guidelines of communication with policy makers which should be nationally adapted. This should be done in collaboration with skilled communicators to assist soil scientists with guidelines on how to communicate technical information to a political audience															

Pillar and activities	**Year 1**			**Year 2**			**Year 3**			**Year 4**			**Year 5**		
	1	**2**	**3**	**1**	**2**	**3**	**1**	**2**	**3**	**1**	**2**	**3**	**1**	**2**	**3**
Pillar 3: Promote targeted soil research and development focusing on identified gaps, priorities, and synergies with related productive, environmental, and social development actions.															
Outcome/Activity 3.1: African Soil Research for Development Platforms															
3.1.1 Inventory of existing soil research platforms at regional and international levels.															
3.1.2 Hold consultative sub-regional workshops to define and establish the platforms: Determine aims and objectives, mode of operations and organization, roles of the platforms in implementing activities 3.2 and 3.3 in this implementation plan, define their TOR and list the different stakeholders of the various platforms.															
3.1.3 Linking and embedding the R4D platforms in existing regional and sub-regional structures and soil science societies in SSA.															
Outcome/Activity 3.2: List of soil-related research gaps presented in an R4D research website															
3.2.1 Design a R4D website/page															
3.2.2 Produce information on soil status and soil research gaps through workshops and consultancy with national focal points.															
3.2.3 Elaborate and report the status of the regional soil resources on the R4D website.															
3.2.4 Adapt and translate the scientific message to inform all stakeholders and the larger public.															
Outcome/Activity 3.3: Regional research working groups															
3.3.1 Identify priority themes working groups based on research gaps identified in Outcome 3.2.															
3.3.2 Develop the TOR for each working group with a procedure of nomination of researchers and institutions.															
3.3.3 Share the TOR with different country members.															
3.3.4 Organize regional workshops to set up the different working groups.															

Pillar and activities	Year 1			Year 2			Year 3			Year 4			Year 5		
	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
Pillar 4: Enhance the quantity and quality of soil data and information: data collection (generation), analysis, validation, reporting, monitoring and integration with other disciplines.															
Outcome/Activity 4.1: Compilation of soil data sources and soil mapping covariates															
4.1.1 Develop national inventories of existing data and where data is held.															
4.1.2 Analyze data availability and copyright.															
4.1.3 Develop metadata for all data sources.															
4.1.4 Collaborate with global P4WG on INSII establishment.															
4.1.5 Inform member institutions of INSII activities.															
Outcome/Activity 4.2: African soil database developed															
4.2.1 Establish structures for IP and data use.															
4.2.2 Develop a network of technical institutions of soil information.															
4.2.3 Rescue data and develop an online database.															
Outcome/Activity 4.3: Online interaction platform for DSM															
4.3.1 Develop an online interaction platform for DSM discussion and link with GSP website.															
Outcome/Activity 4.4: DSM training package															
4.4.1 Conduct a training needs assessment at national level.															
4.4.2 Develop DSM training materials.															
4.4.3 DSM capacity building through online training and training workshops.															
4.4.4 Develop and maintain a full time technical DSM support system.															
Outcome/Activity 4.5: Soil texture map for Africa															
4.5.1 Customize harmonized procedures for data relevant to soil texture in terms of soil analysis and soil parameters.															
4.5.2 Develop soil texture maps.															
4.5.3 Verify the maps.															
Outcome/Activity 4.6: Updated soil database															
4.6.1 Customize harmonized procedures for methods of soil analysis and soil parameters measured for all data in the African soil database.															
4.6.2 Implementation of a soil sampling and analysis programme to supplement the soil database.															
4.6.3 Update soil database with newly generated data and information.															
Outcome/Activity 4.7: Soil status monitoring system															
4.7.1 Develop or adopt framework for monitoring soil status.															
4.7.2 Develop the SoilSTAT system.															

Pillar and activities	Year 1			Year 2			Year 3			Year 4			Year 5		
	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
Pillar 5: Harmonisation of methods, measurements and indicators for the sustainable management and protection of soil resources.															
Outcome/Activity 5.1: Harmonization procedure for soil description															
5.1.1 GSP/FAO to set up an 8-member committee representing all the sub regions of relevant soil experts to implement activities under Pillar 5 in consultation with Pillar 5 working group.															
5.1.2 Determine the different soil classification systems used per country and develop a common harmonization concept for soil description and classification at regional level to produce a step by step guide. Include reference to analysis methods to enable the correlation of soil properties between different areas/regions. Integrate local level soil descriptions by scientists and farmers into national, regional and global levels.															
5.1.3 Develop a list of common regional soil description parameters, indicating the most crucial soil properties to be described in every soil map.															
5.1.4 GSP/FAO to make available enough copies of soil description and classification guidelines e.g. the WRB, SOTER Manual, etc. for use by national soil institutions.															
Outcome/Activity 5.2: Regional soil correlation events held															
5.2.1 GSP to facilitate development of bi-annual regional soil correlation and evaluation events.															
5.2.2 Conduct quality checks on soil data sets from member states during the process of collection exercise for mapping purposes with the collaboration of Pillar 5 Working Group.															
5.2.3 Soil Institutions in Africa to work in close liaison with the global soil information management committee and IUSS and ISO working groups.															
Outcome/Activity 5.3: List of national and regional reference laboratories															
5.3.1 Develop an inventory of facilities and manpower capacities at national and regional reference laboratories.															
5.3.2 ISO Certification of at least one soil laboratory per sub-region (West, Central, East and Southern Africa) (if not already certified) for purposes of standardization. Where necessary, this would include capacity building and training of personnel in the chosen standardized methods, and upgrading of equipment necessary to do the standardized measurements.															
5.3.3 ISO certified soil laboratories in SSA to engage in the International Soil-analytical Exchange Programme to enable increased quality assurance.															