ReSAKSS Phase II (2011-2015) Work Plan

January-December 2011 Work Plan

Contents

A: Background and Overview

At a meeting in Rome in June 2002, the African Ministers of Agriculture reviewed and endorsed the Comprehensive Africa Agriculture Development Programme (CAADP) of the African Union's New Partnership for Africa's Development (NEPAD). The strategy aims at accelerating growth and achieving the first millennium development goal (MDG1) of halving poverty by targeting 6 percent annual average agricultural growth rate and spending 10 percent of national public expenditure on agriculture.

Since January 2007, the International Food Policy Research Institute (IFPRI) and the Africa-based CGIAR Centers (IITA, ILRI and IWMI) have provided strategic and monitoring analysis to guide implementation and track progress and performance of the CAADP through establishment and operation of the Regional Strategic Analysis and Knowledge Support System (ReSAKSS) under the project entitled *The Collaborative Research and Capacity Building Program to Inform and Track the Implementation of CAADP* (or **ReSAKSS Phase I**).

The overall project has played a critical role in advancing the CAADP agenda. In particular, ReSAKSS helped the NEPAD Planning and Coordinating Agency (NPCA), the Regional Economic Communities (RECs), and their stakeholders to: develop a framework for monitoring and evaluating (M&E) CAADP at all levels and create a state of the art knowledge management system to facilitate peer review, dialogue, and mutual learning as part of the CAADP implementation process. By the end of 2010, 22 countries had signed their country CAADP compacts, 18 had developed national agricultural investment plans, and 15 countries had held their technical reviews, out of which five (Ethiopia, Niger, Rwanda, Sierra Leone and Togo) had accessed financial resources from the Global Agriculture and Food Security Program (GAFSP) fund for implementing their investment plans.

As countries enter the operational stage of investment program design and execution, the need to carry out studies to establish high quality indicator baselines to measure and track major implementation and outcome targets will grow. Furthermore, as countries proceed with their investment activities, they will be need regular updates of baseline studies to measure progress and of impact studies to review efficiency. Finally, the national, regional and continental dialogue and review processes, which are critical to improving policy efficiency and outcomes, will require a steady stream of targeted information and knowledge products.

This document outlines the workplan activities and outputs of ReSAKSS in consolidating itself as the main source and network of agricultural development information in Africa, and deepening its work in identified priority areas in order to ensure better coordination, cooperation and communication among the broad array of CAADP stakeholders to achieve more desirable and better distributed outcomes (or **ReSAKSS Phase II**). The overall workplan for the five-year project (i.e. January 2011 to December 2015) is first laid out, followed by the specific workplan for 2011 (i.e. January to December 2011).

B: Rationale, Goal and Objectives of ReSAKSS Phase II

The overall goal of ReSAKSS Phase II is to consolidate ReSAKSS as a leading knowledge management platform for strategic and operational information for their stakeholders (both state and non-state actors) involved with agricultural and rural development in Africa leading to greater growth and faster poverty reduction.

The objectives of ReSAKSS Phase II are:

i. to continue the development of ReSAKSS into a leading one-stop shop for strategic and operational information for the RECs and their member states;
ii. to provide technical assistance for the establishment of country-owned knowledge support system following signing of their CAADP compact and as part of implementation of their national agricultural investment plan;
iii. to provide technical and analytical support for full operationalization at country level of the CAADP M&E system; and
iv. to prepare for local takeover of the management of ReSAKSS at the end of the project.

Together, the above objectives will contribute to the following outcomes:

a. The availability of timely and relevant information to guide the planning, implementation, and evaluation needs of CAADP as illustrated by:
   1. the production and dissemination of adequate indicators to track implementation performance and progress, and
   2. their demonstrated use in key CAADP review and dialogue fora, in particular the CAADP partnership platform (PP), and by the African Union Commission (AUC), NPCA, and the RECs (particularly COMESA, ECOWAS, and SADC) and their member states in their respective planning, review, and dialogue processes.

b. The satisfactory operation of a well integrated M&E system as illustrated by:
   1. existence of effectively linked country level and regional teams, working under clearly defined roles and using shared data standards, norms, and exchange protocols,
   2. regular collection, documentation, and processing of basic data to generate the required indicators at regional and national levels, and
   3. timely publication and ready availability as well as accessibility of the above indicators and related monitoring reports.

C: Key Activities and Outputs of ReSAKSS Phase II

In order to meet the above objectives and achieve the stated outcomes, ReSAKSS Phase II will pursue three sets of activities under the following three distinct components: knowledge management, agricultural sector trends and strategic analysis, and capacity strengthening.

1. Knowledge management: consolidation and transitioning of ReSAKSS

During the second phase, ReSAKSS will consolidate its unique niche and value addition as knowledge platform to support evidence and outcome based agricultural sector policy planning and implementation in Africa. Key activities under this component will include: (a) operation of an IT-based platform for review, learning, dialogue, and benchmarking and (b) development and implementation of an M&E system to track CAADP implementation progress and outcomes.

1a. IT-based platforms for review, learning, dialogue, and benchmarking

1. continue to improve the ReSAKSS-AW (Africa-wide level) website and develop and manage regional-level webpages that are fully integrated with the ReSAKSS-AW (Africa-wide level) website content and extend its reach and use as a main tool to inform planning, dialogue, and review processes under CAADP at all levels;
2. work closely with country SAKSS nodes at the country level to make sure that relevant information from the trend and monitoring analyses (see Activities *1.b* and *2.b*) are readily available, accessible, and used to guide the planning and implementation of country level activities and track the progress against country level targets, including commitments made in the national CAADP compacts;
3. work with the RECs at the regional level to ensure ready availability, accessibility, and use of findings and information from the regional trend analysis (Component 2) and country level monitoring analysis (Activity *1.b*) to promote peer review and mutual learning among member states; and,
4. work with NPCA and AUC at the continental level to ensure that findings from the regional and country level trends and monitoring reports are properly and regularly integrated into an Africa-wide report and reported at relevant continental level fora, including at least the CAADP PP meetings.

In all of the above cases, ReSAKSS will:

5. develop complementary modes of information dissemination to reach those who may not be able to access electronically distributed products through well-designed posters, brochures, handouts, printed working papers and reports. Additionally, knowledge products and tools will be communicated to policy analysts and practitioners via discussion papers, conference presentations, training courses, media briefs, and journal articles.

1b. M&E System to track policy implementation progress and outcomes

1. provide necessary technical and analytical assistance for the full operationalization at the country level of the CAADP M&E framework;
2. work closely with the country SAKSS nodes to be established to standardize and harmonize the selected set of core M&E indicators that will enable cross-country comparisons and contribute to the peer and mutual review at regional and continent-wide levels. This will include the development of a standardized protocol for data collection, measurement, and reporting, and how countries follow through in adhering to the demands for improved data systems and reporting. The adequate collection of quality data on the identified set of indicators is fundamental to the successful

implementation of the M&E system. The ReSAKSS Regional Nodes will facilitate this by involving various partners, including the RECs, CAADP country teams and/or focal persons, CAADP implementing partner institutions, Ministries of Agriculture and Finance, other agriculture-related ministries, Statistical Bureaus, and other national nongovernmental bodies;

3. establish effective and demonstrable agreements with the RECs and national centers of expertise on shared platform for benchmarking indicators, data collection and analysis, including baselines on key indicators such as public expenditures in agriculture, poverty, incomes, agricultural productivity, trade and other relevant policy indicators.

The information gathered through the M&E work at the regional and country level will be stored and disseminated in greater capacity through the website, which is technically designed to allow detailed disaggregation and combination of data for the purpose of cross comparison and downloading by using a variety of exposition tools ranging from different types of charts, maps, tables, and short summaries. A major output from the M&E work will be the annual agricultural sector trends and situation analyses to be prepared by ReSAKSS at the continental and regional levels. It is expected that country level versions of the trends reports will be prepared by the country SAKSS nodes as well. Furthermore, special monitoring reports will be published as input into existing or future regional review and learning as determined by the RECs and their member states, as well as for the CAADP-PP meetings. Finally, occasional reports will be published to cater to specific events that would require such documents.

2. Agricultural sector trends and emerging strategic issues

The agricultural trends and outlook work will constitute as one of the flagship products of ReSAKSS besides the M&E tasks laid out above. Trans-border aspects of the agricultural sector and the hugely strategically important regional markets are too often ignored, not well understood, and absent in virtually all national strategies. The common agricultural policies of COMESA, ECOWAS and SADC, for example, are starting to turn the attention of policy makers and the private sector alike to the potentials of regional agricultural markets. These markets and the dynamics of the sector at the regional level need to be better analyzed and understood to guide future actions under CAADP and other regional trade and integration efforts. Furthermore, from time to time, African countries face major issues that require quick action by policy makers and other stakeholders at the regional level. These could be occurrences that disrupt cross-border markets and need to be addressed, or major new policy initiatives at the regional level that need to be guided. It has not been possible in the past, to tackle these challenges in a timely, comprehensive, and technically adequate enough manner. The rare exception has been the food price crisis, thanks to the quick response by ReSAKSS to mobilize local expertise and engage with COMESA and ECOWAS for example to carry out the necessary analyses to guide decision by national and regional policy makers.

In light of the above, the following two major activities are therefore planned under these components: (a) annual agricultural trends and outlook report (ATOR) and (b) strategic analyses on emerging issues affecting the agricultural sector.

2a. Annual agricultural trends and outlook reports (ATORs)

Continuous analysis of quantitative, qualitative, and spatial data collected by the ReSAKSS regional nodes will be published annually in the form of *Annual Agricultural Trends and Outlook Reports (ATORs)* at the continental, regional and country levels. Based on the M&E indicators identified in the CAADP M&E framework, the ATORs will provide up-to-date data and information on the key policy questions facing the continent and the RECs and their member countries. The ATOR, which is also the CAADP M&E Report, will focus on the key indictors identified in the CAADP M&E Framework including agricultural policies and growth, government revenues and expenditures, composition and priorities of agricultural expenditures, agricultural sector performance; agricultural markets and trade, and poverty. Each year, a special topic on which detailed analysis will be undertaken will be featured. These include agricultural productivity (2011, see Annex for details), agricultural investments (2012), agriculture and vulnerability and social protection strategies (2013), MDG achievements (2014), and growth and poverty reduction strategies (2015).

2b. Strategic analyses on emerging issues

ReSAKSS will continue to produce reports based on strategic analyses of key emerging topical issues of particular importance to African countries. Examples of such issues include food and financial crises, emerging trade and investment issues, avian flu, land and climate change issues, and agricultural input (*e.g.* fertilizer, seeds, *etc*) delivery approaches. In particular, ReSAKSS will work with Universities, Policy Institutes and other knowledge centers in Africa and other parts of the world to produce occasional reports on analyses of indicators collected by ReSAKSS and other partners. Although ReSAKSS will participate directly in such analyses, it will also commission a set of studies to these partners in the areas where they have comparative advantages. ReSAKSS will serve as a knowledge broker by synthesizing the results of studies carried out by its partners in the form of occasional trends reports.

3. Capacity support for the establishment of country knowledge systems

Capacity building will continue to be a cross-cutting component and will be implemented strategically alongside other activities of ReSAKSS. Capacity building activities are proposed to be a multi-stakeholder partnership working with regional bodies, government authorities, institutions, researchers, and other stakeholders to strengthen the capacity and knowledge base for agricultural policy making in the context of broader development strategies in individual countries and at the regional and continental levels. The proposed capacity building activities will be organized in two main areas:

1. *Technical assistance for the establishment of country knowledge systems* combined with mobilization of expertise and collaboration between regional and national nodes for learning by experience. In line with the original plan of a sequential strategy to create adequate tools and platforms for review, benchmarking and learning under CAADP, that is to start with the ReSAKSS Regional nodes and to be followed by the establishment of low-cost systems at country level, a major focus during the second phase of the project will be on technical assistance and collaborative support for the creation and operation of the planned country SAKSS nodes. These nodes are a critical instrument in support of one of the key goals of CAADP at the country level, namely the

establishment of an inclusive review and dialogue mechanism. ReSAKSS will work with the country CAADP teams to set up the SAKSS nodes based on existing institutional realities. The bottom line is to arrive at a set up that allows countries to systematically: (i) mobilize and link existing centers of knowledge to carry out the necessary analyses and create related knowledge products to guide CAADP implementation; (ii) channel the findings and other technical information to decision makers in and outside of governments; and (iii) sustainably build knowledge management capacities in the country. In most countries, this would involve universities, research centers, policy analysis units, statistical offices, management institutes, and other think tanks.

2. *Centralized services to the national SAKSS nodes*, including methodology support, technical training, quality assurance, outreach, and partnership management. ReSAKSS will also facilitate collaboration across the different country SAKSS nodes in areas such as the implementation of the CAADP M&E framework, including the facilitation of shared standards and protocols for the collection, storage, analysis, and exchange of data. Finally, ReSAKSS will facilitate input by national nodes into the review and learning activities at the regional level.

4. ReSAKSS governance, coordination, and management

ReSAKSS is governed by the leadership at each respective node, which includes a coordinator and staff at a CGIAR center and a steering committee.

The activities of the entire ReSAKSS network will continue to be overseen by the leadership and coordination at the Africa Wide node at IFPRI (ReSAKSS-AW) and the CAADP ReSAKSS Continental Steering Committee (co-chaired by AUC and NPCA). This set up will continue in 2011, with efforts aimed at increasing coordination and communication across the network. The CAADP ReSAKSS Continental Steering Committee is expected to meet twice a year. In addition, online collaboration tools are being employed to increase communication and shared resources across the nodes.

At the regional level, the Africa-based CGIAR Centers, IITA, ILRI and IWMI will continue to provide technical oversight to ReSAKSS-WA, ReSAKSS-ECA and ReSAKSS-SA, respectively, to ensure that their activities remain relevant to the priorities of CAADP and that they have access to adequate technical facilities to continue to operate satisfactorily. The technical day-to-day management will continue to be coordinated by the ReSAKSS-ECA Coordinator under the supervision of an ILRI Senior Manager. The Steering Committees are chaired by the respective REC with representatives from member countries as well as professional organizations.

Specific Activities and Outputs for January–December 2011

ReSAKSS-AW Node

Tasks	Delivery Date	Description of Deliverable

1. Annual Trends and Outlook Report (ATOR)
• Feature topic (agricultural productivity)
  o Lead formulation of and coordinate research across partners
  o Contribute to analysis and write-up of different components
  o Lead write-up of overall project report
	31 October	• Concept Note and Proposal outlining activities and outputs (see annex)
		• Outputs and reports (see annex)

• Trends and analysis of CAADP M&E core indicators
  o Collate data across regional nodes
  o Analysis & write-up
	31 December	• Methodology for calculating continental and regional average values of the CAADP M&E indicators
		• Draft report (by 31 Dec 2011) to be used in consultations
		• Final report (by March 2012) to be presented at CAADPP

2. Technical Assistance (TA) to setting up CAADP Country SAKSS	Throughout year	• Architecture, functions and outputs of the country SAKSS • Backstop ReSAKSS regional nodes
3. Capacity Strengthening of AUC, NPCA and other Africa-wide institutions involved with CAADP	Throughout year	Report on purpose, topic and tools used for capacity strengthening activities, e.g., involvement with growth and investment analysis, CAADP technical reviews
4. Knowledge management • Website updates • Monthly e-Newsletter and weekly blog	Throughout year	A website but independently managed and continuously updated products, news, events, and other information relevant to CAADP implementation in Africa
5. Occasional analysis and papers (on topics such as impact assessment, investment analysis, and high food prices—these are limited and serve only to respond to urgent needs to deal with short term issues of broad strategic consequence)	Throughout year	Research topics, tasks, deliverables and delivery dates shall: • be agreed upon with each ReSAKSS Continental Steering Committee, ReSAKSS regional and country nodes, and other stakeholders; • fall within the mandate and competence of ReSAKSS-AW; and • depend on availability of resources aside from those allocated to other tasks and deliverables

6. Coordination and oversight across regional and country nodes, and provision of centralized services		• Leading and/or following up with:
		  o annual workplans and contracts
		  o quarterly and annual reports
		  o publications review
		  o other deliverables
		• Backstopping regional and country nodes on:
		  o M&E
		  o Webpage development

ReSAKSS Regional Nodes

Tasks	Delivery Date	Description of Deliverable
1. 2010 Annual Trends and Outlook Report (ATOR) • Data collection on CAADP M&E core indicators • Analysis & write-up	15 March 2011	• Database on CAADP M&E core indicators on countries in respective region (actuals up to 2009 and 2010 estimates) • ATOR in similar format as the 2010 Continental Report
2. 2011 Annual Trends and Outlook Report (ATOR) • Data collection for feature topic (agricultural productivity) • Analysis & write-up	31 August 2011	• Data on selected indicators of agricultural productivity at the regional level and for selected countries (see annex) • Report on agricultural productivity • Database on CAADP M&E core indicators on countries in respective region [actual up to 2010] • ATOR in similar format as the 2011 Continental Report
3. Technical Assistance (TA) to setting up CAADP Country SAKSS in selected countries in the respective region[†]	Quarterly 31 March 30 June 30 Sept 31 Dec 2011	Discussions (through missions, electronic and other means) with in-country officials (Ministry of Agriculture and CAADP Country Team), stakeholders (including state and non-state actors), and donors leading to establishment of country SAKSS. Main output of TA will be: • Draft proposal on SAKSS Node (including: architecture, functions and outputs; funding; TORs for the Coordinator and Oversight Body; and Guidelines for the Network)[†]
4. Capacity Strengthening of REC and other regional institutions involved with CAADP in each region	Quarterly 31 March 30 June 30 Sept 31 Dec 2011	Report on purpose, topic and tools used for capacity strengthening activities; and number of people trained by institutional affiliation, gender, etc.
5. Webpage setup and management	30 June 2011	A webpage that is integrated with the ReSAKSS-AW website but independently managed and continuously updated by each ReSAKSS node with knowledge products, news, events, and other information relevant to CAADP implementation in the respective region
6. Occasional analysis and papers (on topics such as regional investments, regional trade, and high food prices—these are limited and serve only to respond to urgent needs to deal with short term issues of broad strategic consequence)	31 Dec 2011	Research topics, tasks, deliverables and delivery dates shall: • be agreed upon with each ReSAKSS regional node's Steering Committee and other stakeholders in the respective region; • fall within the mandate and competence of the ReSAKSS regional node; and • depend on availability of resources aside from those allocated to other tasks and deliverables

[†] Target countries for 2011 are:

ReSAKSS-ECA: Burundi, DRC, Ethiopia, Kenya, Tanzania, and Uganda

ReSAKSS-SA: Malawi, Mozambique, Swaziland, and Zambia

ReSAKSS-WA: Ghana, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone, and Togo

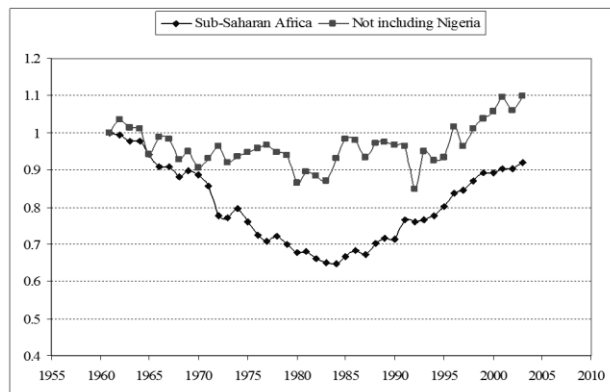# ANNEX: 2011 CAADP M&E Feature Topic on Agricultural Productivity

by

ReSAKSS and HarvestChoice

Introduction and Background

The Comprehensive Africa Agriculture Development Programme (CAADP) provides an agriculture-led integrated framework of development priorities aimed at reducing poverty and increasing food security by achieving an average of six percent agricultural growth rate every year. Initial economic modeling results to support CAADP planning indicate that while it is possible for many African countries to reach this target, it will require substantial additional growth across different agricultural sub-sectors and commodities, as well as substantial investments to stimulate the necessary acceleration in growth. In many cases, the agricultural investments required are in excess of the 10 percent of total expenditures commitment agreed under the Maputo declaration. This is necessary because of the moderate and slowly growing agricultural productivity across the continent, as the different indicators in Figure 1 reflect.

Figure 1 (A-C)

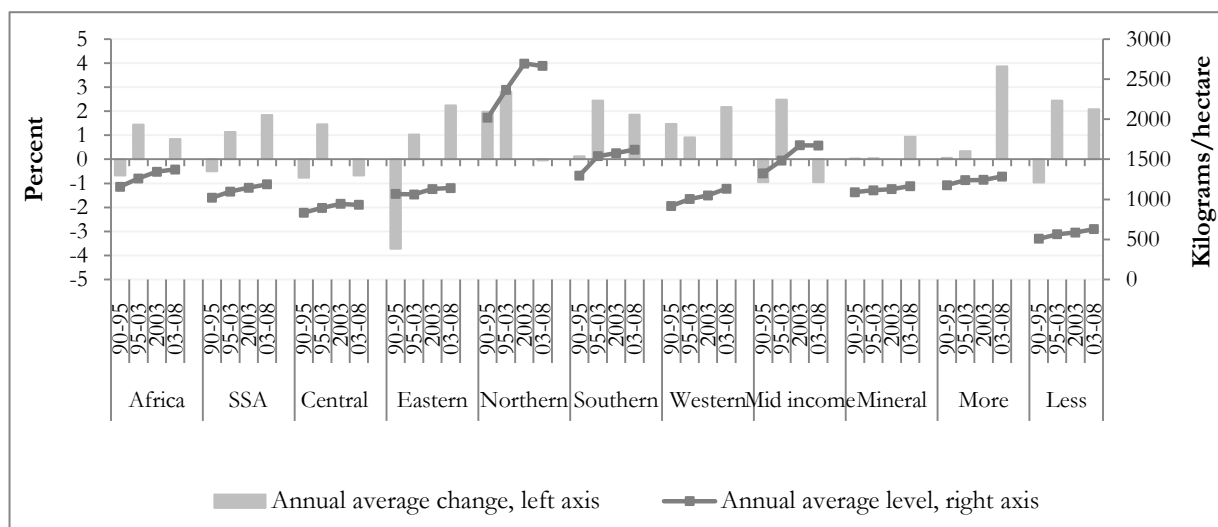A: Index of cumulative TFP growth in SSA (1961 = 1) B: TFP growth decomposition in SSA & others, 1994-2003
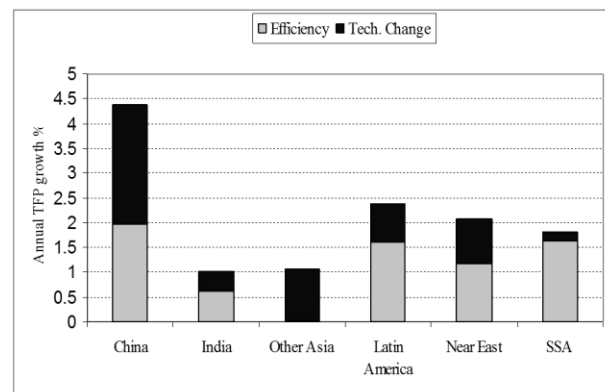
Source: Nin Pratt and Yu (2008).

C: Cereal yields (kilograms per hectare) in Africa and sub-regions.

Source: Benin et al. (2010, CAADP M&E Report—forthcoming).

Notes: Mid income is middle-income countries; Mineral is favorable agricultural conditions and rich in minerals; More is favorable agricultural conditions but not rich in minerals; Less is less favorable agricultural conditions.

The evidence further suggests that the moderate and slowly growing agricultural productivity across the continent has been driven mostly by reallocation of productive factors (i.e. efficiency gains) rather than technological advancement (i.e. technical change) (see e.g. Nin Pratt and Yu 2008). As countries enter the operational stage of CAADP investment program design and execution, a fundamental policy research question is how to raise and maintain high agricultural productivity across different parts of the continent, particularly technical change given the limits to factor substitution.

Rationale, Goal and Objectives of the Study

Answering the above question requires addressing several follow-on questions ranging from: fundamental and conceptual ones on the definition and measurement of agricultural productivity to more complicated ones on understanding the determinants and drivers of productivity and then more challenging ones on program design and implementation by translating the knowledge into effective action.

The overall goal of the study is to conduct research on agricultural productivity in Africa to provide options for raising and maintaining high agricultural productivity and lead to more effective design and implementation of agricultural policies and strategies in Africa. The specific objectives are:
1. to better understand the usefulness of different measures of agricultural productivity in monitoring and evaluation;
2. to assess why there has not been widespread technical change in Africa;
3. to review any lessons associated with the efficiency gains in agricultural production achieved in different parts of Africa; and
4. to identify specific agricultural investment programs whose implementation can be scaled up or undertaken in different parts of Africa in order to raise agricultural productivity.

Activities, Methods, Outputs, Responsibilities and Timelines

There are **five** main activity components: with the first focusing on compiling information and data (and sources) on indicators associated with agricultural productivity; the second on developing and testing typology(ies) of countries and regions relating to the evolution of technology adoption and agricultural productivity growth; the third on analyzing the determinants of productivity; the fourth on case studies of successful and failed agricultural investment programs; and the fifth on assessing the benefits of alternate

strategies for raising agricultural productivity. The proposed study will be undertaken at different levels (sub-national, national, regional, Africa-wide) and for different units of analysis (e.g. household, district, country, and ecosystem) using a combination of research methods and tools.

Activity 1: Collecting and validating data and developing database(s) for study

The entire project will depend on building a reliable database that serves the different analytical components in a uniform manner.

a. Create Stata datafiles using various national household and agricultural surveys
- Household consumption: quantity and value by commodity or food item (including conversion of food items back to "base" commodities, and share of consumption from own production).
- Household production: quantity and value of output, input and sale for each agricultural (i.e. crops, livestock, fishery and forestry/hunting/gathering) commodity
- Gender disaggregated labor use for different economic activities
- Access to and use of services and infrastructure (distance, time, frequency)

b. Create excel database on sub-national and national level agricultural production on (from FAOSTAT, national agricultural statistics, etc):
- Amount of output by: sub-sector (crops, livestock, fisheries, forestry); commodity groups (cereal, staples, exports, etc.); and commodities
- Factors of production: number of livestock by type (cattle, goats, etc.) and improved breeds; land area by sub-sector/commodity (crops, livestock, fisheries, forestry); land area under irrigation and improved technologies (seeds, fertilizers, pesticides, etc.); Labor (including population rural/urban, economically active) by sub-sector/commodity (crops, livestock, fisheries, forestry, hunting).
- Prices, wages, interest rates
- Value of public and private agricultural investments (research, extension, land improvement, machinery, equipment)

c. Collect and generate GIS data layers of 10x10 km grids (for several periods in time e.g. 1980s, 1990s, and 2000s): [Spatially explicit time series data will only be available for limited sub-sets of variables: Climate (monthly), total population maybe decadal, crop/grazing lands maybe irregular 10-15 year views]
- Ecosystem services and biotic constraints [runoff time series, snapshot; nutrient extraction, carbon/OM]
- Production systems and productivity (including many of those identified in 1b) [SPAM, rainfed, irrigated areas, livestock systems. Partial productivity measures including $/ha, $/ag worker for ~2005. Could MAYBE generate similar using population and landcover snapshots (crops, prices etc) from above at decadal steps].
- Infrastructure and market access (including especially prices) etc. [Yes, single snapshot most likely. To local markets but also distance to ports/airports for ship/air trade.]
- Investments and technology adoption (including many of those identified in 1b). Irrigated areas
- Population and poverty (based on demographics splits from HH survey (2000 urban/rural split only))

d. Validate or ground-truth GIS data layers via ReSAKSS networks, using HC tools and procedures to facilitate this feedback

e. Review major policies and strategies implemented over the course of the periods for which data a, b and c are available

f. Identify potential case studies (specific investment programs and value) to be reviewed

Activity 1 outputs, timelines and responsibilities and labor

Activity	Outputs	Timeline (2011)
1a	Stata datafiles	April
1b	Excel datafiles	April
1c	Digital layers	March
1d	Validated digital layers and maps	May
1e	Matrix of major policies and strategies	April
1f	List of potential case studies showing rationale for selection	April

Activity 2: Creating and testing typology of "sub-national potential agricultural productivity zones"

Building on the FAO farming systems demarcation and SPAM, this research activity will involve statistical and econometric methods, particularly spatial and cluster techniques, to group sub-national agricultural production regions according to similarity in their agricultural potential or likely pathways of technology adoption and agricultural productivity growth. The indicators (2a) to be used include
1. farming system level agro-ecology: land area
2. Pixel level linkage table with country names, sub-national names, and district names
3. pixel level linkage with farming system: soil characteristics, rainfall, temperature, length of growing period, SPAM outputs of 20 crops including (area, yield, and production), agricultural value of production, potential remotely sensed datasets (e.g. NDVI);
4. pixel level demographic indicators: rural and urban population, urban extent
5. pixel level infrastructure indicators: road density, market access in travel time;
6. national level economic indicators: food trade, nutritional intake (calorie, protein and fat);
7. sub-national level technology adoption by crop.

The *first step* is to use the FAO farming systems to create sub-national agricultural production zones using the SPAM data. Joe will share the table with team members to determine the appropriate unit of analysis, agricultural productivity potential zone (something greater than pixel but smaller than farming system)—**see Annex for farming systems map and description of data reflecting progress made by HC.**

Country / admin units	Farming system	Crop 1			Crop 2			…	Population	Etc.
		area	production	yield	area	production	yield			

The available household (HH) survey data on socio-economic indicators (from Melanie) is linked to the GIS data (from Joe) via matching the administration units of the HH datasets with the administrative boundaries of the GIS and SPAM databases. The availability of HH surveys helps us to identify countries for potential country case studies.

The *second step* is to compile the characteristics (or attributes) for each agricultural productivity potential zone. There are two ways to identify the cluster: one is to intersect farming system with administrative units, and the other is to develop potential agricultural domains based on pixel level aggregation of farming system, infrastructure, and demographic indicators (e.g. population density).

In the *third step*, econometric analysis will be used to extract the determining factor in identifying each agricultural productivity potential zone, and largely reduce number of attributes for our study. The resulting determining factors also help us to recognize the constraints in each agricultural productivity potential zone, and, thus come up with a typology. The typology will not be confined by administrative border, allowing great flexibility in capturing the binding factors in each country. The final typology table will report typology by

constraints, and one country can be included in more than one category. For example, country X can face water constraint in 55% of area and soil constraint in 45% of area.

The typology will be tested using the validated spatially-referenced data at the local level (2b) and then modified accordingly (2c). It is possible to have different typologies for different measures of the underlying indicators, particularly different measures of productivity.

Activity 2 outputs, timelines and responsibilities

Activity	Outputs	Timeline (2011)
2a	Initial typology(ies)	April
2b	Tested	May
2c	Modified	June

Activity 3: Determinants of agricultural productivity growth

This activity will involve household surveys, econometric, GIS and spatial analysis of the determinants of agricultural productivity to indentify the key drivers and constraints at different levels (Africa-wide, regional and national), using the spatial databases. As the focus is on spatial determinants of technology adoption, we define a model that uses spatial variables as independent variables explaining adoption. We assume that technology adoption results from profitability of the particular technology, which depends on output and input prices and technical parameters (yields and input use). As prices are not directly observed we assume that household prices are a function of distance to markets and transaction costs (spatial variables). On the other hand, yields and input productivity are functions of natural resource quality in different regions. Using this information we define a **reduced form model that relates dependent variables with spatial variables which are basically instruments for the non-observed economic variables. Dependent variables are obtained from household survey data which are spatially allocated,** including adoption or not of different technologies, access to credit, extension and other variables affecting technology adoption. Spatial variables will be used as independent variables in the model: soil aptitude for agriculture, distance from each location to the nearest secondary or primary road, distance to nearest town and village, characteristics of production systems in each location, administrative boundaries, etc. This analysis will be conducted for countries with available household survey data looking at contrasting cases to estimate models that can be used in countries for which household survey data is not available and according to the country typology defined in Activity 2. For the econometric analysis, at least 2 years of spatial data, if possible from the 1980s, 1990s, and the latest information available in the 2000s, will be needed to include in the econometric analysis the effect of (with and without) policy changes.

Activity 3 outputs, timelines and responsibilities

Activity	Outputs	Timeline (2011)
3a	Africa-wide level	August
3b	Regional levels	August
3c	Selected countries	August
3d	Selected production systems (cross-cutting geographic boundaries)	August

Activity 4: Case studies of successful and failed agricultural investment programs

To strengthen the findings from Activity 3, this will involve case studies of selected agricultural investment programs and value chains (both successful and failed and including investment programs in similar AEZs beyond SSA) to identify what worked well where and why or why not.

For selection of lessons under 4a and 4b, there is need to have clear selection criteria and the input from activity 2 on typologies (AEZs) is important and we may need to have a list of indicators to help us categorize programs/projects into success or failed.

[For the case studies, is it possible to concentrate on specific number of cases by agricultural commodity (i.e. crops, livestock, fishery etc,) per sub-region and in selected number of countries?]

Activity 4 outputs, timelines and responsibilities

Activity	Outputs	Timeline (2011)
4a	Lessons from selected regional investment programs and value chains	August
4b	Lessons from selected country and sub-national investment programs and value chains	August

Activity 5: economic analysis of alternative strategies for raising productivity

This activity will involve simulation techniques to assess the scale and distribution of (net) benefits associated with alternate strategies for raising agricultural productivity. The estimated coefficients obtained in activity 3 will be used to model the relationship between spatial variables and technology adoption. Further econometric analysis will be used to improve simulations by introducing constraints to coefficients or relationships among variables, and introduce non-linearities or interaction terms. This will allow us to mimic potential changes in different agricultural policies and strategies aimed at the major drivers and constraints of agricultural productivity identified in Activities 3 and 4. The CAADP investment plans will particularly be useful in setting up the alternative strategies. Issues of land grabbing, modeled via potential available land for example, can be addressed in this analysis. As the proposed simulation technique endogenizes technology adoption, it allows for analyzing the implications of shocking different spatial or spatial-related variables on the extent and location of technology adoption and its productivity impact. On treating productivity as an exogenous shock/process, the DREAM could also be used; and linking its outputs to STATPlanet visualization might be a useful ReSAKSS web-site tool for providing access to detailed results.

Activity 5 outputs, timelines and responsibilities

Activity	Outputs	Timeline (2011)
	Scale and distribution of (net) benefits of alternative strategies	September

Project Reports and Deliverables

It is expected that there will be several publishable outputs, including ReSAKSS Working Papers (WPs) and Issue Briefs (IBs) (see www.resakss.org), which will feed into 2011 CAADP M&E Report (or 2011 ReSAKSS Annual Trends and Outlook Report). The results of the study will be presented the ReSAKSS Annual Conference planned for November 2011. The table below shows the expected outputs/reports and publication outlets.

Output/Report	Publication
1. Databases and maps	Databases downloadable from ReSAKSS and HC websites
2. Typology of regions of countries on evolution of adoption of technologies and productivity growth	ReSAKSS WP and IB
3. Determinants of agricultural productivity growth	ReSAKSS WP and IB
4. Case studies of successful and failed agricultural investment programs	ReSAKSS WP and IB
5. Economic analysis of alternative strategies for raising agricultural productivity	ReSAKSS WP and IB
6. Status of and strategies for raising agricultural productivity in Africa (synthesis report from the separate reports)	ReSAKSS WP and IB

Project Collaborators, Coordination and Guidance

<u>Collaborators</u>

ReSAKSS: Sam Benin, Athur Mabiso, Adam Kennedy and Carly Petracco (AW), Joseph Karugia, Stella Massawe and Paul Guthiga (ECA); Pius Chilonda and Tazvitya (SA); Mbaye Yade, Manson Nwafor, Maurice Taondyande and Marcus (WA); Claude Bizimana (Rwanda).
HarvestChoice (IFPRI): Stan Wood, Jawoo Koo, Zhe Guo, Melanie
DSGD (IFPRI): Alejandro Nin Pratt, Bingxin Yu
WCAO (IFPRI): Ousmane Badiane, John Ulimwengu
Others: Eduardo Magalhaes (consultant, DSG collaborator)

<u>Coordination</u>

Sam Benin will be in charge of overall project coordination. Alejandro Nin Pratt and Stan Wood will be in charge of the technical aspects of the project, including inputs of staff from DSGD and HarvestChoice, respectively. As agreed at the December 2010 meetings, careful coordination, teamwork and feedback among all collaborators will be critical for the success of project, starting with working effectively together on building the database(s).

<u>Guidance</u>

To ensure the relevance of the project in the agricultural development agenda in general and CAADP in particular, an Advisory Committee made up of about five renowned scientists on the topic will be created to:

i.   Review and suggest ways to improve the study workplan;
ii. Provide advice on direction of the study and propose adjustments as needed; and
iii. Review, suggest ways to improve, and endorse the report of study results, findings and recommendations.

Figure 1: Farming Systems in Africa
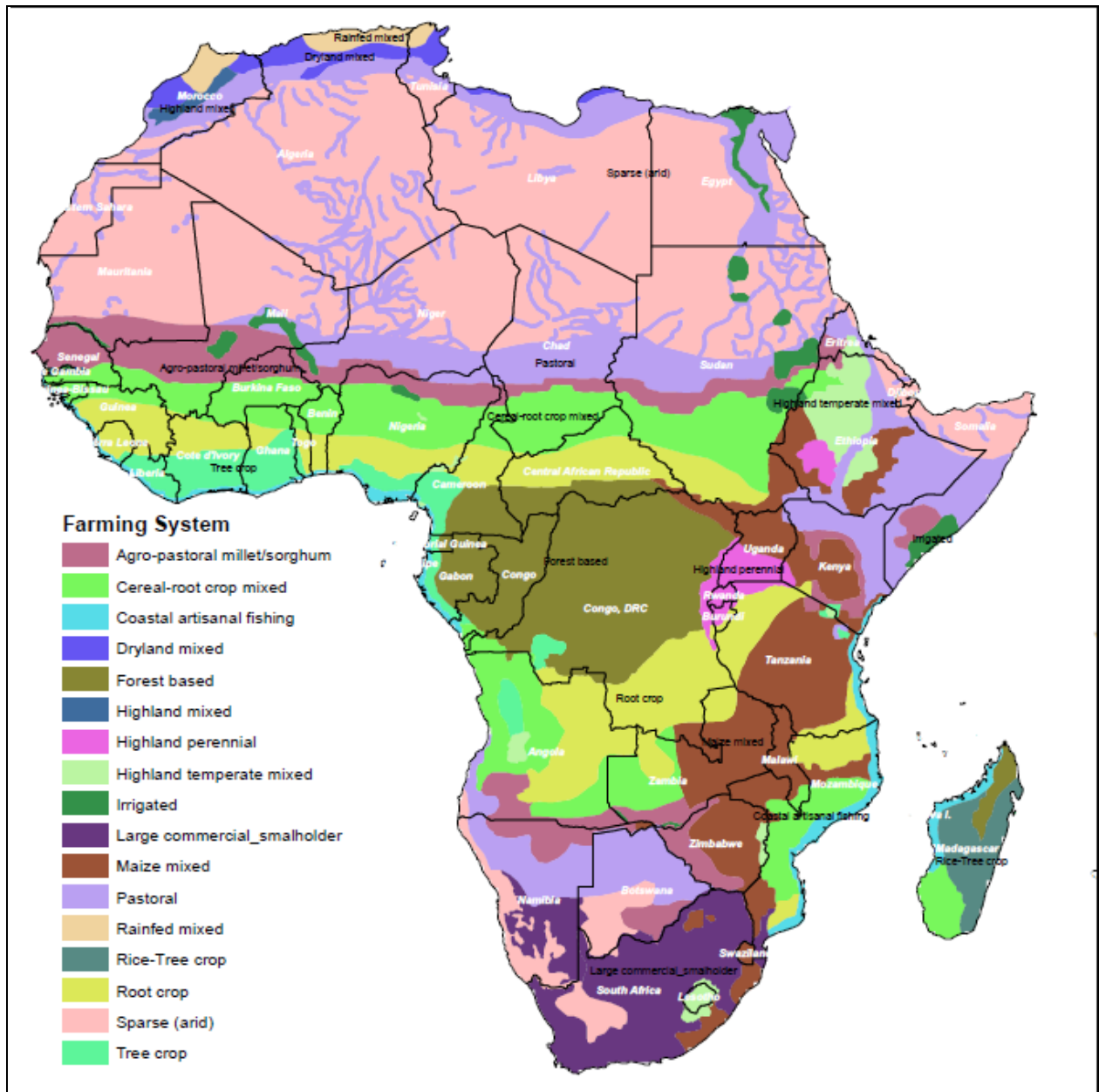
Source: HarvestChoice

Accompanying data available in excel format: Country, Farming System (FS), Percent of FS in total Area, Area (ha), Land area (ha), Total Population (by rural and urban) Production of and Area under (wheat , rice, maize, barley,millet, sorghum, potatoes, sweet potatoes, cassava, bananas and plantains, soy beans, beans, oilseeds and pulses,   sugarcane, sugar beets, coffee, cotton, other fiber crops, groundnuts, other oilseeds, other crops)