



# The Africa RISING research sites in Tanzania - Opportunities and challenges to sustainable intensification and institutional innovation

Background paper

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The Africa Research In Sustainable Intensification for the Next Generation (Africa RISING) program comprises three research-for-development projects supported by the United States Agency for International Development as part of the U.S. government's Feed the Future initiative.

Through action research and development partnerships, Africa RISING will create opportunities for smallholder farm households to move out of hunger and poverty through sustainably intensified farming systems that improve food, nutrition, and income security, particularly for women and children, and conserve or enhance the natural resource base.

The three projects are led by the International Institute of Tropical Agriculture (in West Africa and East and Southern Africa) and the International Livestock Research Institute (in the Ethiopian Highlands). The International Food Policy Research Institute leads an associated project on monitoring, evaluation and impact assessment.



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## Introduction

Agriculture in Sub-Saharan Africa is facing many challenges. Population growth and rapid urbanization in combination with deterioration of arable land, water and natural resources call for intensified research on sustainable intensification of food production. But increased productivity is not enough – research must also take into consideration how production of food can reduce poverty and malnutrition while at the same time secure productive environments for future needs. This multi-dimensional task will not find simple and straightforwardly scalable solutions, as one of the big challenges is the heterogeneity of needs and production environments in Sub-Saharan Africa.

In response to this, the US government has launched the initiative Feed the Future, and, by support of USAID, Africa RISING (Africa Research In Sustainable Intensification for the Next Generation) is one of the programs to implement this initiative (Africa RISING 2012). One of the cornerstones of Africa RISING is to support integrated farming systems, i.e. farming systems that integrate annual and perennial crops for cash and subsistence, livestock and its products as well as soil and water conservation measures in order to sustain production and household income in a long-term perspective. An integrated system is also integrating the post-harvest and marketing aspects of agricultural production along value chains, as well as the institutional, socio-cultural and economic considerations of production and sustainable livelihoods. In this respect, institutional innovation in relation to sustainable intensification becomes an obvious focal point.

Within a wide definition of integrated farming systems as above, there must be room for innovative approaches to individual components of the system, such as new crop or livestock varieties, agricultural inputs or marketing aspects along a particular value chain. It is however crucial to assess the effects of such modifications of single components on the system, and furthermore to develop (and try) more comprehensive approaches to integrated farming that is sometimes not apparent at the farm (household) or plot level. In order to address primary challenges of reducing poverty and halt environmental degradation, we must not lose sight of these overarching goals in the name of disciplinary research success. It is certainly true that research must follow its own logic and that results cannot be forced to the front, but only by working together across academic and administrative boundaries, the long-term needs can be fulfilled. The approach of this report is therefore academic as well as practical, critical as well as pragmatic. As the results are based on vast amounts of research and other reports, secondary data, but also years of earlier fieldwork

experience with Tanzanian farmers, it is necessary to outline the scope for this particular task as it is presented within the Africa RISING Framework.

## **Africa RISING – aims and approaches**

As described above, Africa RISING takes on a broad role in promoting integrated farming systems as a strategy to the overall purpose of the program:

The overall aim is to provide pathways out of hunger and poverty for small holder families through sustainably intensified farming systems that sufficiently improve food, nutrition, and income security, particularly for women and children, and conserve or enhance the natural resource base. (Africa RISING 2012, p. 5)

Africa RISING provides a program-wide framework, and the research and development activities are organized in three regional projects – targeting specific agro-ecological systems environments in, respectively, West Africa, Ethiopian Highlands and East & Southern Africa. The program-wide framework departs from a number of research and development objectives, consequently resulting in research outcomes and development outcomes. At the regional project level, particular activities are identified to support the objectives and aiming at the respective outcomes. As Africa RISING is organized as a network of partners, where all project activities are carried out by different partners, separately or in collaboration with others, coordination of activities in the project sites (and at the action site level) is an essential part of the program. So, rather than a research body in itself, Africa RISING's role is rather that of an "innovations intermediary":

an organization or body that acts as an agent or broker in any aspect of the innovation process between two or more parties. Such intermediary activities include: helping to provide information about potential collaborators; brokering a transaction between two or more parties; acting as a mediator, or go-between, bodies or organizations that are already collaborating; and helping find advice, funding and support for the innovation outcomes of such collaborations. (Howells 2006)

An important distinction is of course that Africa RISING has a role of co-ordination of all program activities, including reporting of outcomes to the supporting institutions. It is nevertheless a challenge to coordinate partners with sometimes conflicting interests, not least as these interests are often either research-oriented or development-oriented. Another important dimension concerning innovation systems is the possible conflict between system-oriented and component/discipline-oriented interventions in the field. These are aspects to bear in mind in design of activities and work-

packages at the action site level, but as well for the future scaling of activities to the regional/system-wide level and beyond.

## **Aim of background paper**

This background paper is the first report of two, and the aim is to present and explore the institutional landscape of the two action sites in Tanzania (Babati and Kongwa-Kiteto), representing two different agro-ecological zones (the semi-humid and the semi-arid, respectively). The sites also differ in terms of institutional set-up, where Kongwa-Kiteto is an integrated part of the USAID Feed the Future Initiative, while Babati was initially chosen as a reference, and thus follows a slightly different logic. The implications of this will be further elaborated in the second report.

This report is structured as a broad-based situational analysis of the three districts, with particular focus on aspects relevant to sustainable intensification. An important part is to map and analyze the impact of previous and parallel programs related to the proposed Africa RISING activities. As the program is still in its initial phase, there will be less emphasis on the activities in the first round of project villages, and more focus on the potential of scaling of any activities related to sustainable intensification. The concluding chapter is therefore a synthesis of challenges to be met in the different sites, together with a first round of stakeholder analysis to inform the next step of this study - to initiate and set up Research-for-Development (R4D) platforms for sustainable intensification in the project sites.

The second report will present a research approach relevant to the Africa RISING Action sites in relation to interventions of sustainable intensification. The approach will furthermore suggest, based on the theory of change, impact pathways for sustainable intensification and potential for scaling of interventions. This, more general, approach will be reported in full detail and presented at the Africa RISING workshop in September 2013.

## **Rationale**

The research priorities for Africa RISING are “informed” by a long list of constraints to smallholder rainfed crop production (Africa RISING, p. 3). As one important objective for this study is to:

[I]dentify the economic, social and institutional constraints to the adoption of agricultural technologies and institutional innovations in ESA Project Areas, Tanzania (ToR, item I),

the point of departure has been to go beyond the list of constraints to identify a way forward based on theoretical and practical experiences of the limits to straightforward adoption of new

technologies and the reasons behind. Although informed by institutional approaches and a systems innovation perspective, the program framework reflects a deeply rooted transfer-of-technology perspective, illustrated by a long list of constraints of the humansphere to the adoption of new technologies by lack of knowledge, lack of inputs, lack of credits, markets, secure tenure, etc, all implying that the technology is available, but the farmers/communities/society are not ready to change. For this reason, I have decided to start out from another angle, by doing a brief, diagnostic situational analysis of the readiness of the project sites to embrace the challenge of sustainable intensification. Another important reason for this is the outspoken ambition of the Africa RISING program to focus on integrated system approaches, including combined components in integrated farming systems (annual and perennial crops, livestock, soil and water conservation, etc) as well as the institutional framework of markets, value chains, power relations and tenure as relevant for the outcomes in terms of better nutrition and well-being for rural families, women and other under-privileged groups. This includes a demand-driven agenda, where the entry points or interventions may as well be an outcome of negotiations between involved partners or support of local innovations, as an outcome of conventional agricultural research methods:

Its research activities will be problem-focused and driven by changes in market demand, evolving policy environments (e.g. food security and environmental mitigation) and changing social structures (resulting from migration / urbanization etc.). It will also meet the needs of farmers. These activities will support the integration of SI-related innovations from a wide range of sources (past research, ongoing adaptive research and indigenous solutions) into the farming systems that are targeted. (Africa RISING 2012, p. 2)

It is important to stress that the approach is supportive of launching of new technologies, only that these often need to be supported by a range of institutional capacities, including a local demand. In the end, this program will not be evaluated according to the spread/adoption of certain technologies, but to the impact that these technologies may have induced.

### **Impact of research – closing the yield gap**

A recurring theme in agricultural intensification is the “yield gap”, in most cases referred to as the difference between potential yield and actual yield. In some instances, the literature refers to “closing the yield gap”, and that can have at least two meanings: aspiring for reaching a higher output close to the potential yield (as above), or, a relative measure that concerns the gap between high-performing farmers and low-performing farmers within *e g* a village, or aggregated differences between high- vs. low-yielding regions within a country, related to a more equitable distribution of output. Unless otherwise stated, I use the first definition in this report. It must however be pointed out, that in reaching development outcomes (such as reducing poverty), the latter definition is also

valid from a resource efficiency perspective. Higher equitability as a goal must then imply an increase in productivity of the poorer/low-performing households.

According to the World Development Report 2008, exploitable yield gaps are especially high in medium- to high-potential areas, which include a large portion of maize-growing areas in Africa. 'Closing the gap' is however not only a matter of adoption of new technologies or agricultural practices, but involves "putting in place the institutional structures—especially well-functioning input and output markets, access to finance, and ways to manage risks—that farmers need to adopt the technology" (World Bank, 2008, p.67).

For the individual farming household, the managing of risks is always present, and thus not even the best farmers go for maximum returns (closing the gap). This is evident for instance in the use of improved seeds, where most farmers keep a part of the plot with local/indigenous/reproductive seeds as a risk management strategy. This example is very straight-forward, but we must remember that there are many more parameters in risk aversion for the farmer, and most of these are not as visible as *e.g.* the use of local seeds. The road to understanding of low adoption rates is long and winding and involves on-farm as well as off-farm aspects, some of them relates directly to the household situation, whereas others are consequences of institutional relations, policies and decisions at different levels. It is therefore of great importance to address constraints to adoption at several different levels and not only as an issue of the individual household.

### **Some introductory comments on sources and materials used**

The report is based on a wide range of sources, and by the time of the compilation of this report, there were no available base-line studies for the project sites with relevance for the topic of sustainable intensification. The selection of sources may thus seem random. The aim, however, is to make a diagnostic study of the potential for scaling activities of sustainable intensification, so the following is a strategic selection of data and previous research to highlight the most important themes of relevance to Africa RISING's activities. It is, first and foremost, a desk study, as the allocated time for fieldwork was limited to a few days visits to each of the project sites in May 2013. The fieldwork focused on meetings with district representatives and stakeholder organizations, complemented with a few village and farm visits in each site. A great deal of the results is therefore a compilation of secondary sources, complemented with field observations. It goes without saying that the presentation below is fragmentary, and it is important to keep in mind the ambition to cover both some basic biophysical/agronomic aspects as well as socio-economic/institutional aspects.

*Official statistics:* The presentation departs from official statistics, including the recently (March 2013) published population census of 2012 and the national agricultural survey for the season

2007/08 (published 2012). The agricultural survey is a tool to get an idea of regional variations along a wide range of agricultural aspects, and the data is aggregated at the district level. It is however based on relatively small samples in each region and the reliability is therefore relatively low for application to matters at district level or below. The rationale for using this source is rather that it is a repeatedly conducted survey, and will give some response to issues of scaling of activities to a regional and national level. Another problem is the compilation of the survey data *per se*, as, even if it is published several years after, there are still numerous obvious mistakes in compilations of tables and diagrams. In addition to these sources, I have consulted the socio-economic profiles of Dodoma and Manyara Regions, which are now a bit dated, but provide some area- and district-specific information which is useful. For triangulation of data about education, nutrition, health and household economy, I have also consulted the Demographic and Health survey (2010), the Tanzania National Panel Survey (2008/2009) and the Household Budget Survey of 2007.

*Research articles and reports:* The report owes a lot to previous research, and the main objective here has been to compile and analyze the most recent works in the three districts that relate to sustainable intensification in agriculture. It covers a range of topics and approaches, but is in most cases based on field work. Research with a more general focus on sustainable intensification aiming at understanding the overall theory of change will be summarized in the second report.

*Other sources* include websites and various forms of communications from international, regional and local stakeholders of relevance for sustainable intensification and rural development as described above. For the objectives of the program, it is crucial to identify and analyze organizations, initiatives, completed and on-going projects to capture the complexity of the institutional setting and to establish some ground for a discussion on research-for-development (R4D) platforms. This is mainly done by interviews of key informants and compilation of reports, pamphlets, websites and other published or unpublished material.

## **The Africa RISING research sites**

The presentation below involves a number of aspects, although the focus is to characterize the districts in relation to its potential for sustainable intensification, including bio-physical, human and organizational aspects. In addition, it may serve as a framework for coming discussions on system interventions and R4D platforms for sustainable intensification in the action sites. There is little material and base-line data at the village level (with a notable exception of Babati district, where most villages have village land use plans and village profiles) for making more detailed recommendations to the project villages. Most of the data presented here are aggregated and will be

shown as preliminary data at the district level. Maps of the districts and location of research sites are shown in the maps section, annex 1.

## **Kiteto District**

### **Introduction**

Kiteto District is since 2002 a part of Manyara Region and covers a land area of 16,645 km<sup>2</sup>. The population in 2012 was 244,669 (The United Republic of Tanzania 2013), with a growth rate of more than 4.8% per year over the last ten years. Kiteto and the neighbouring Simanjiro District (to the north) have experienced large in-migration of people the last 30 years, providing a new agricultural frontier into the drier semi-arid areas. The in-migration of people is also reflected by the low dependency ratio (94 dependants to 100 bread-winners 2002) (URT 2005)

Still, the population in Kiteto is largely rural (87.5% 2002)<sup>1</sup> and the mainstay of the economy is agriculture (99.3% of the rural households, of which about 30 % own livestock (TUR TZ 2012b)). The frequency of female-headed household in Kiteto is 20%. 39% of the agricultural heads of households cannot read and write (58% of the female-headed households).

The district falls into three discernible agro-ecological zones with declining rainfall along a transect from south to north (travelling from Kongwa District) (URT 2005):

Zone I: subhumid highlands, 800-1000 mm rainfall per annum, soils vary from red or grey sandy loams to red clay loams that are moderately fertile and suitable for its principal crops maize, beans and pigeon peas. This zone covers the southern part of Kiteto District.

Zone II: semi-arid midlands, 450-700 mm rainfall, often of short duration and with an unreliable pattern. Soils are of poor fertility and the main crops are sorghum, sunflower, cotton, finger millet and cassava. The zone covers large parts of the midlands of Kiteto.

Zone III: the Maasai steppe, 350-400 mm rainfall per annum with short and unpredictable pattern. The soils have moderate to low fertility and are suitable for production of sorghum, bulrush millet, finger millet and beans. In Kiteto, this is the northernmost part, bordering the Maasai steppe and Simanjiro District.

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<sup>1</sup> There is no distinction between urban and rural population for Kiteto District in the 2012 census. In some other districts in the national census, some larger urban areas are now administered as their own town councils, separated from the district councils.

In contradictions to these general conditions, maize is now grown widely in all three zones. The Africa RISING project activities are mainly implemented in Zones I and II, i.e. the sub-humid and semi-arid zones.

Farming of annual crops is the most important livelihood activity for smallholder households in Kiteto district, followed by livestock keeping. According to the Agricultural Survey of 2007/08, the area planted with annual crops was 109,734 ha, of which maize production dominates (see table 1) (URT 2012b)

**Table 1.** Some major crops grown in Kiteto District 2007/08 and their average yields (URT 2012b)

Crop	Planted area (ha)	Yield (tons/ha)
Maize	96,260	1.2
Sorghum	151	0.9
Sunflower	10,697	0.5
Beans	1,509	0.4
Pigeon peas	4,123 ha planted, 4,109 ha harvested	0.5

The number of households involved in agriculture was 30,196. About 86 % of the allocated area is currently being utilized for agriculture, and the average planted area per household is comparatively high (3.6 ha per household). The growing conditions and land management practices of these vast areas vary however widely. The use of inputs and improved seeds in the district is very low, and the area planted with application of fertilizers was 2,237 ha (less than 2 %), all of it reported to be organic fertilizer applied in the *masika* (long rains) season in March-May (2007/08 season, URT 2012b). The use of insecticides was slightly higher, 9,270 ha, while the use of fungicides or herbicides was very limited. Farming is entirely rainfed, and no irrigation was reported in Kiteto district (*ibid*).

18% of the farm households experience soil erosion on their land<sup>2</sup>, but the proportion of households with soil erosion control and water harvesting facilities was less than 7%. Most of these facilities were in the form of terraces, drainage ditches, erosion control bunds, and water harvesting bunds. Livestock ownership and cattle population is relatively moderate - 213,088 cattle - considering the district being traditional home area to largely pastoral communities. (URT 2012b)

In the 2007/08 agricultural season, 3.2% of the households reported to borrow money for agriculture. Of these, female households were reported to have more access to agricultural credits (69 % of those who accessed credit). Traders and traders’ stores, cooperatives and private individuals were the main source of agricultural credits to agricultural smallholders in the district. (URT 2012b)

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<sup>2</sup> Reporting on soil erosion and its control is a complex matter that involves training and awareness. These numbers are reported from the agricultural survey and must be seen as very preliminary

**Table 2.** Constraints to farming, Kiteto 2007/08<sup>3</sup> (URT 2012b)

Most important constraint	% of households	Second most important constraint	% of households
Poor soil cultivation equipment	24.4	Poor soil cultivation equipment	19.3
Access to land	19.0	Access to improved seed	12.6
Access to potable water	12.1	Cost of inputs	11.3
Access to improved seed	8.4	Access to potable water	8.4
Extended dry spell	6.3	Access to credit	8.4
Access to credit	5.7	Ownership of land	7.4

### Research outlook on agriculture in Kiteto District

The characterization of Kiteto district shows a frontier for extensive agricultural production, something that is in apparent conflict with traditional land use patterns and long-term sustainability goals on marginal or potentially vulnerable land. The rapid increase in farming on rented or share-cropped land, in combination with very low investments in terms of fertilizer application or soil and water conservation measures, the district faces many challenges to sustainable intensification. In addition, the institutional environment reflects this with strong proponents of increased production of cereals (mainly private enterprises), government-supported crop-oriented land management policies, and, in contrast, local and global NGOs supporting traditional land use patterns and resource management based on pastoralism.

There is a long-standing tradition of well-documented research on pastoralism in northern and central Tanzania. Some recent works of particular interest are Bee et al (2002, on the Maasai in neighbouring Simanjiro) and the report of Tenga et al (2011) on more general legal issues related to pastoralism and land use in Tanzania. Schöpperle (2011) provides interesting insights in the identity and livelihoods of the Akie group, one of the last hunter-gatherer people in Tanzania which is rapidly diminishing or being integrated among agro-pastoral Maasai. The conflict between the government's "agriculture first" (*Kilimo Kwanza*) approach, which in this area propagates for destocking, and the livelihoods of pastoral peoples, is evident. It is fuelled by a process, which can be seen as land grabbing, where private entrepreneurs rent and share-crop land from poor households, who benefit from their right of occupancy to make short-term benefits. These agreements do often involve conditions, which do not allow any investment on the land. Productivity is kept low as long as land is available. The conflict between maize farming and pastoralism in Kiteto, and the ethical considerations involved, is reported in detail by Maghimbi (2008).

<sup>3</sup> Here, farmers were instructed to single out the five (out of a list of 26) most important challenges that constrained their development in agriculture. Only the top scores for the two most important challenges are reported in the table. The most striking feature is that not less than 43.7% of the households found "poor soil cultivation equipment" to be the most or second most important constraint.

There is furthermore a wealth of documentation of successful participatory forestry management, particularly in the widely recognized SULEDO Forest Community, including nine villages in the southeastern part of Kiteto District (UNDP 2012, Sjöholm and Luono 2002). This provides some lessons to be learned on conflict management between pastoralism, crop farming, fuelwood needs and commercial logging on common and protected lands.

There is a need for in-depth research on the productivity and sustainability of current agricultural practices, as the knowledge is limited about the extent and the agreements made in different ventures. In parallel, development projects and NGOs have worked in the area to promote *e.g.* agroforestry practices and other soil and water conservation measures. The Sida-financed Land Management Programme (LAMP) has been operating in Kiteto since the mid-1990s with broad approaches to land management - land title deeds, soil conservation, agroforestry, water harvesting and, more recently, conservation agriculture. A study by Sebyiga (2008) in Kiteto district concludes that the average maize output had increased from 1.5 t/ha (1999/2000) to 2.0 t/ha (2003/04) where land conservation programmes had been effectively implemented. The main purpose of the programme was to improve soil fertility, but the adoption of practices was low (29%). The recommended practices included terracing, alley cropping and tree planting (*ibid*). Generally, the lack of enforcement of local by-laws seems to be a crucial factor for low adoption. The role of training and resources for extension services are also emphasized for the success.

There are reasons to also look at broader studies conducted in Kiteto district, as it is obvious that the range and variability in health, nutrition and food security between and within villages are large. A fairly recent survey carried out by University of Minnesota (Svec et al 2012) in five villages in Kiteto reveals high levels of child malnutrition and large numbers of stunted and under-weight children. The levels of food insecurity are also high, but vary greatly within villages. The study also indicates widespread concern for soil erosion in villages dominated by crop farming, while the pastoral communities address problems of drought and cattle diseases. In general, the survey provides insights on local institutions, local leadership and the unhealthy combination of limited government services and scattered and/or disrupted interventions by various NGOs (*ibid*). The role of continuous and skilled support from agricultural extension services is emphasized as a prerequisite for food security.

In a study of the technical efficiency of 115 farm households in Kiteto, results suggest that policy variables and socio-economic variables contribute significantly to the technical efficiency in maize production (Msuya et al 2008). According to this study, mechanization (the use of ox-plough or tractor) does not contribute positively to productivity, and the same goes for application of pesticides. This can be explained by the relative efficiency of using hand-hoe on small plots and the

low adoption of pesticides. If only few farmers apply *e.g.* insecticides, none of them are protected at a pest outbreak, hence the investment being negative for productivity. The results from studies like this one on technical efficiency strengthen the arguments for a wider approach to agricultural systems interventions.

## Kongwa district

### Introduction

Kongwa District is located in the eastern corner of Dodoma Region and borders Kiteto District to the north, and covers a land area of 4,041 km<sup>2</sup> (URT 2003). The population at the time for the census in 2012 was 309,973, corresponding to an annual growth rate of 2.2% during the period 2002-2012, which is well below the national average of 2.7%. The district is mainly rural and counted 50,735 agricultural households, of which 29% were female-headed. 38% of the agricultural heads of households cannot read and write (51% of the female-headed households). (URT 2012a)

The district is characterized by its semi-arid conditions, with a rainfall of 450-700 mm/year, but with great variability and often distributed within a very short period. The mainstay of a great majority of the population is crop farming, sometimes in combination with livestock. The district has a distinct rural character, with few urban areas. The markets along the Dodoma-Morogoro/Dar es Salaam road, cutting through the center of the district, are however lively, particularly the “international” market in Kibaigwa, which is a major crop/cereal market for Tanzania.

**Table 3.** Some major crops grown in Kongwa District 2007/08 and their average yields. (URT 2012a).

Crop	Planted area (ha)	Yield (tons/ha)
Maize	108,568	1.0
Sorghum	17,503	0.6
Sunflower	17,163	0.7
Groundnuts	15,818	0.6
Bulrush millet	3,749	0,5
Tomatoes	553	14.2

The total planted area of annual crops (both short and long rainy seasons) was 169,982 ha. The acreage for the major crops is shown in table 2. The growing of beans, cassava and pigeon peas was limited in Kongwa in the 2007/08 season, but varies greatly between years. The use of improved seed is comparatively high in Kongwa - 27,007 ha or 16% of the planted area. Organic fertilizer was applied to only 2.2% of the land in the long rainy season, and the use of inorganic fertilizer and pesticides was negligible in the district. According to official statistics, 80-90 % of households – in some cases even more – received extension advice on input use in Kongwa, primarily from

government extension staff (URT 2012a). The effect in adoption of different practices is in that perspective very low. However, this kind of statistics tends to overemphasize the actual outreach of extension activities. 23% of the farm households experienced soil erosion on their land, but the proportion of households with soil erosion control and water harvesting facilities was only 10%. A mere 1 % of the agricultural households reported to receive credit for farming needs in the 2007/08 season.

The cattle population in the district was 115,125, of which more than 99 % were of indigenous breed. Kongwa had a relatively high number of pigs (56,498) in the 2007/2008 season. (URT 2012a)

**Table 4.** Constraints to farming, Kongwa District 2007/08 (URT 2012a)

Most important constraint	% of households	Second most important constraint	% of households
Extended dry spell	22.2	Poor soil cultivation equipment	20.7
Poor soil cultivation equipment	21.0	Access to improved seed	14.8
Access to land	15.8	Pest and disease	8.4
Access to credit	5.4	Extended dry spell	7.7
Soil fertility	5.4	Cost of inputs	7.4
Cost of input	4.7	Soil fertility	6.7
Access to off-farm income	4.7	Access to off-farm income	6.4

### Research outlook on agriculture in Kongwa District

The British NGO FARM-Africa has had a widespread project on seed production (maize, sorghum, pearl millet) in Dodoma region (including Kongwa) in the early 2000s (Goromela et al 2004, FARM-Africa 2004). The project seems to have had a good institutional set-up with good networks of village leaders and farmers. The production of seeds was affected by drought (2003), and the project concluded that the farmers needed to be better connected to markets and credit institutions to sustainably provide cereal seeds (*ibid*).

The climate variability with recurrent droughts is a particular concern for the semi-arid zone and Kongwa district. In a study from 2011, 69.7% of the households in Kongwa reported to experience food shortage in the period January-March (Lugandu et al 2012). The dry and variable conditions have made sorghum more popular, although much of the harvest is still sold to buy the preferred staple maize. The failure to sustain food security in these years is however determined by many factors. Guarino et al (2010) reports on the failure of sorghum in Kongwa after the drought 2009 as an example, where the farmers were encouraged to use improved drought-tolerant varieties. The improved open-pollinated varieties available were however attacked by pests (covered kernel smut and *Striga*), and in addition the long-term storage properties of these improved varieties were not

suitable for the local conditions. The study by Page et al (2010) confirms that the shortage of *Striga*-resistant varieties, together with the occurrence of covered kernel smut, may have caused harvest losses of more than 50%. The role of post-harvest losses of grain in Kongwa is studied in detail by Makalle (2012), and the results show that the control of grain pests and storing capacity is absolutely essential for food security in the district.

To avoid even further effects of drought and excessive run-off, techniques to keep soil moisture is gradually introduced. In a study of neighbouring semi-arid districts of Dodoma and Chamwino, Swai and Majule (2009) explore the effects of conservation tillage, in this case tie ridging and ripping, respectively, on sorghum performance. Both techniques give significantly better results than traditional *kuberega* (slash and burn/handhoe tillage). The adoption of these techniques depends on the availability of oxen and training in how to use the implements, among other things. The technology of ripping and ridging is made available in recent years on a wider scale, particularly in Kiteto and Babati through the LAMP programme. Recent evaluations by the African Conservation Tillage Network (ACT-Africa 2013, Lugandu et al 2012, 2013) in six districts across semi-arid Tanzania show very low levels of adoption of conservation agriculture principles (minimum soil disturbance, soil cover, and crop rotation or associations). Kongwa is at the bottom end in this study with no recognizable adoption<sup>4</sup>. Kongwa is also the district that tends to take in hired labour to a large extent at labour peaks, indicating that labour is available and the need for mechanization is low. The factors that significantly affect adoption of conservation agriculture in the six study districts are access to training resources, knowledge dissemination through farmer research groups and weather conditions (Lugandu et al 2012). According to the farmers' perceptions in the study, the knowledge and support of conservation agriculture is considerably lower in Kongwa than in the other five districts.

As semi-arid Tanzania shows increased vulnerability in relation to climate variability, it is also of great importance to research real and potential differential effects among different social categories, *e.g.* gender. Nelson and Stathers (2009) provide both a more general understanding of the challenges of climate change from perspectives of gender and equity, but they have also made an in-depth study of one of the Africa RISING project villages (Laikala) in Kongwa district. The study focuses on adaptation strategies to climate change at a local level, and they set up and explore a multi-stakeholder environment of innovation and learning. The unpredictability of rainfall sets off several activities that increase the vulnerability of disadvantaged groups. As Kongwa is dominated by labour-intensive farming, the tendency to farm larger areas to produce enough food leads to increased need for hired labour. This encourages labour migration, particularly of men, leaving women, elderly and

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<sup>4</sup> These figures are taken from the 2011 survey (Lugandu et al 2012). A survey from 2012 in Kongwa by the same author (Lugandu et al 2013) reports however an adoption rate of 9% (adoption of all components of CA). Samples are however small, a total of about 60 households in three villages in Kongwa district.

children with an increased burden at home. The growing and marketing of new, more drought-tolerant, crops may also alter social and power relations (*ibid*).

An innovation systems approach was also tried out in the study by Majule et al (2009). The study focuses on implementation of DADPs (District Agricultural Development Plans) under the national ASDP (Agricultural Sector Development Programme), and includes a Farmer Learning Group (7 farmers) in Laikala village. It is important to follow up if any scaling up or permanent impact can be seen from this project, which among other things focused on tillage, improved seeds and tree planting.

## **Babati district**

### **Introduction**

The population of Babati District was in 2012 405,500 (312,392 for Babati District Council and 93,108 for Babati Town Concil) (URT 2013). The intercensal growth rate for the district was almost 3.0 % per year between 2002 and 2012 (303,013 urban+rural 2002). The agricultural survey of 2007/08 counted 63,816 agricultural households, of which 15% were female-headed (URT 2012b). 25% of the agricultural heads of households could not read nor write (58% of the female-headed households).

The land area is 4,969 km<sup>2</sup>, of which about 180,000 ha is arable<sup>5</sup> land (Löfstrand 2005). Babati District is well documented as a place with the most shifting landscape and growing conditions (see map 2, annex 1). This area has also in recent history attracted people from different parts of Tanzania – and even beyond – for the availability of fertile land. Within the district, a wealth of different crops is planted, ranging from rice and cotton in the lower-lying plains in the northern parts to wheat and Irish potatoes above the Rift Valley escarpment to the west. Babati is also a melting pot of different cultures and ethnic groups, although the agro-pastoral Iraqw and the related Gorowa count as indigenous to this part of north-central Tanzania (Hillbur 1998). The mix of peoples, environments and the different agricultural practices is in many ways unique to Tanzania, and has also attracted research and subsequent development initiatives. In spite of this, systematic on-farm research on productivity, soil health and other agronomic aspects is still limited. To outsiders, Babati is maybe most well-known as a granary for maize and pigeon peas, the latter a crop which has been grown here for the Indian market for decades. The constant in-migration of people since the 1950s has now

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<sup>5</sup> This is a rough estimate. Please note that government statistics (URT 2012b) uses a wide variety of concepts, such as 'usable land', 'area under cultivation' and 'planted area'. 'Planted area' may include more than one season per year and more than crop on the same piece of land, which must be taken into consideration for direct comparisons.

put Babati in a new situation, namely one of shortage of arable and pasture land. As the population growth is still high, the need for sustainable intensification is urgent.

In the agricultural year 2007/08, 97,916 ha were planted with annual crops. This area does not include land under mix of perennial/annual crops, a considerable portion in Babati (29,210 ha) of which most is intercropped maize/pigeon peas (URT 2012b).

**Table 5.** Some major crops grown in Babati District 2007/08 and their average yields (URT 2012b)

<b>Crop</b>	<b>Planted area (ha)</b>	<b>Yield (tons/ha)</b>
Maize	61,327	2.1
Paddy	1,823	3.6
Sorghum	2,983	1.1
Sunflower	12,144	0.7
Beans	12,051	1.1
Pigeon peas	31,893 ha planted, 17,262 ha harvested	0.9
Simsim	1,599	0.5
Chick peas	1,455	0.7
Cotton	959	1.5

The planted land area per household was low (1.3 ha/hh) and the utilization of available land area was as high as 95%, putting high pressure on the arable land. About 10% of the planted area was fertilized with organic fertilizer in the long rainy season 2007/08, while the use of inorganic fertilizer was insignificant. This is remarkable as one of the prime producers of rock phosphates (Minjingu) lies in the district, but in recent years this business now seems to take off. The Minjingu fertilizer products are also a part of Africa RISING's early interventions in Babati.

Improved seeds were used on >50% of the acreage in the short rainy season, and 24% in the long rainy season. Insecticides were used on 9 % of the land, while fungicides and herbicides were less common. Irrigation was practised on a total planted area of 2,573 ha (URT 2012b).

38% of the farm households experience soil erosion on their land, and 34% practise erosion control and/or water harvesting. The most common structures are terraces, drainage ditches, erosion control bunds, and water harvesting bunds, with a small number of tree belts and plantings of vetiver grass (URT 2012b).

Cattle are the dominant livestock type in the region, followed by goats, sheep and pigs. The total number of cattle in the district was 419,544, and the trend is still that of growing cattle populations. The district had a high reported incidence of tick-borne diseases and also some reported tsetse problems. (URT 2012b)

Babati town is an established agricultural market town, which has been further strengthened by the improved tarmac road from Arusha to Singida. There is still, however, pockets of villages with considerably lower market accessibility. In Babati District, 5% of the farm households accessed agricultural credit in the 2007/08 season. 75% of these were men. The main source of credit was cooperatives, family/relatives and commercial banks (URT 2012b). Babati has been one of the pilot districts for the now widespread VICOBA (village community banks) system, which is now present in about 60 of the more than 80 villages of the district.

**Table 6.** Constraints to farming, Babati, 2007/08 season. (URT 2012b)

<b>Most important constraint</b>	<b>% of households</b>	<b>Second most important constraint</b>	<b>% of households</b>
Extended dry spell	19.4	Cost of inputs	17.3
Cost of inputs	18.8	Poor soil cultivation equipment	14.6
Access to land	18.1	Access to improved seed	12.9
Poor soil cultivation equipment	15.6	Soil fertility	12.6
Soil fertility	12.6	Access to credit	8.4
Ownership of land	7.4	Access to land	6.4

### **Research outlook on agriculture in Babati District**

Babati was for many years known as a grain basket for Tanzania, and mechanization has been comparatively high with a large number of tractors available. In the 1980s, yields began to drop, partly as a consequence of compacted soils and sheet erosion (Löfstrand 2005). As the national economy suffered during these years, the extension services and governmental supply of inputs (seed, fertilizers and pesticides) became sparse or absent in the villages. In 1995-96 a comprehensive programme called Dryland farming was launched by LAMP, first in Babati and later in Kiteto, Simanjiro and Singida. This included introduction of ripping and sub-soiling to improve infiltration and soil moisture, use of farmyard manure, improved seeds, intercropping and planting of cover crops. A study by Kienzle (2003) in Babati and neighbouring Karatu District supports the introduction of cover crops for smallholders as a labour-saving technique.

Since then, soil conservation and fertilization practices have developed further, including spread of organic farming principles, tree growing on farm land and construction of contour bunds. In recent years, extension activities also include further mechanization by introduction of direct planter and weeder. Depending on soil structure, the practice of sub-soiling has now given way for other techniques to increase organic content and soil moisture. The LAMP programme has covered most villages in the district although with different activities and shifting results. One of the guiding

principles has been to connect sustainable land use to formalized tenure arrangements. Babati has therefore been a pilot district in Tanzania for village title deeds and individual right of occupancy certificates, supported by the early investment by LAMP in aerial photography and detailed mapping of all villages from the late 1980s and onwards. As large parts of the district are dominated by pastoral or agro-pastoral groups with large cattle populations, the conflicts over land use have been many in the process. To date, all villages now have defined boundaries, and titling as well as individual certificates are under way in parallel with village land use plans (Babati District Council 2013). The land tenure situation in the three districts is presented in table 7.

**Table 7.** Land ownership/tenure in the three districts 2007/2008. Frequency of farm households by type of land tenure. N.B. one household may have more than one type, hence sum >100% (URT 2012a, 2012b)

Tenure / District	Leased/ Certificate of ownership (%)	Owned under customary law (%)	Bought (%)	Rented (%)	Borrowed (%)	Households with area share-cropped (%)	Households with area under other forms of tenure (%)	No. of farm households
Kiteto	2.0	70.9	10.9	18.8	3.7	4.0	2.5	30,196
Kongwa	0.5	82.5	7.2	23.2	3.5	0.5	0.0	50,735
Babati	17.1	73.0	27.0	15.8	3.5	0.7	2.7	63,816

A challenge for the future in Babati District is that of livestock keeping. More pressure on the available land calls for intensified trials on soil fertilization as well as zero-grazing. Today, the experience of zero-grazing of cattle is limited to some areas with highly integrated farming like Bonga-Himiti-Haraa in the southern parts of the district (Hillbur 1998) and villages around Dareda (Dareda, Bermi, Seloto). With few exceptions, cattle are of indigenous breed, although extensive campaigns for high-yielding dairy cattle were implemented by the Heifer Project International (HPI) in the 1980s and 1990s. An initiative more successful in targeting poor households was the introduction of Toggenburg dairy goats by FARM-Africa 1991-2004 known under the concept The Goat Model (FARM-Africa 2007). This model was widely spread in the Dareda area, and the farmer groups formed around the dairy goats are still in function. The investment model in dairy goats has proved to be providing sustained income at low risk for smallholder farmers, especially women.

Another important initiative run by FARM-Africa in Babati was the training of Community-based Animal Health Workers (CAHWs) in the 1990s and 2000s. Due to large cattle herds, there was a great demand for veterinary services in rural areas as a consequence of the withdrawal of government services under structural adjustment in the 1980s and 1990s. The new category of CAHWs could assist in disease reporting and improving animal husbandry practices. Babati was a pioneering district

for this new category of field staff, and led to a change in Tanzania's legislation on the recognition of animal health workers in underserved areas (Bradstock et al 2007). Of great relevance to the activities proposed by Africa RISING in Babati is also the work with Farmers Research Groups, of which some has been active in the project sites (Ewbank et al 2007).

The six villages selected as project sites for Africa RISING represent different agro-ecological zones within the district (see map 2, annex 1), and offer comparison along an agro-ecological gradient that is not directly influenced by USAID supported interventions (Bekunda 2012), such as in Kiteto/Kongwa. It may also inform future scaling of activities in the district. In 2012-13 activities have started in Seloto, Sabilo and Long in the western parts, while the villages of Shaurimoyo, Matufa and Hallu are selected for the next phase. According to the Africa RISING research proposal (Bekunda 2012), the key constraints to achieving increased agricultural productivity range from bio-physical constraints for crops (poor soil fertility, limited access to improved seeds, rainfall variability and pest infestations) and livestock (unavailability of improved breeds, overstocking, pests and diseases) to weak market and extension linkages, inadequate levels of agro-processing/mechanization and conflicts between livestock keepers and farmers. The introduction of new technologies is further constrained by poorly developed understanding of effects on health, nutrition, and gender relations (*ibid.*). The challenges targeted by the initial work packages outlined for Africa RISING will be further discussed in the second report in relation to the R4D platforms.

## **Stakeholder analysis – basis for R4D platforms**

Africa RISING is but one of many programs working on improving the conditions for smallholder farmers in Tanzania, and any success is a result of how well aligned the program is to other ongoing activities and to the current policy environment. Still, the role of the program is to bring about innovative strategies and interventions for sustainable intensification, and the uniqueness (or comparative advantage) of Africa RISING lies in the capacity to develop integrated farming systems to improve livelihoods through research.

At the national level, *Kilimo Kwanza* (Agriculture First) is since 2009 a catalyst for the implementation of the government's long-term Agricultural Sector Development Programme (ASDP). Furthermore, Tanzania joined the Comprehensive Africa Agricultural Development Plan of the African Union in 2010, showing commitment to agricultural development as the vehicle for transformation of the country's economy (Okori 2012). Some important features of the *Kilimo Kwanza* initiative are an increased share of the budget for agriculture, tax exemption on agricultural implements, strengthening of private-public partnerships and an effective implementation of the District

Agricultural Development Plans (DADPs) (President of the United Republic of Tanzania 2013). *Kilimo Kwanza* stresses modernization of the agricultural sector and the private sector is seen as the engine of economic growth. In general, mechanization and improved provision of farm inputs as well as construction and rehabilitation of supporting infrastructure is high up on the political agenda in Tanzania right now. The prime area for implementation is the Southern Agricultural Growth Corridor in Tanzania (SAGCOT), which brushes the border of Kongwa District from neighbouring Kilosa District. *Kilimo Kwanza* supports small-, medium- and large-scale farming, and stresses the importance of bringing up small-scale farmers into a commercial agricultural economy by addressing the needs of value chains. It is however too early to see the effects of this initiative and the effects on agricultural development in the research sites are this far limited.

### **Financial and credit institutions**

After the liberalization of the financial sector in Tanzania from 1991 and onwards, the number of financial institutions and banks has increased, although most of these focus on urban areas and large investments, while loans and services for small-scale agriculture and rural development have been neglected and seen as less profitable (Bee 2007). The development of a healthy and supportive system for agricultural credit in rural areas depend on government policies for financial institutions as well as for investments in public infrastructure such as transport, communication and electricity, but also services for education and health.

In response to this, a number of initiatives to establish sustainable credit institutions in the rural areas have been taken in recent years. In the study area, the most apparent response to this is the VICOBA (village community banks) program, implemented by the international consultancy firm ORGUT. The program started in 2008 and served the Financial Sector Deepening Trust until 2011, using a Village Community Bank model refined in the Tanzanian context. The program was first implemented in the ORGUT managed Land Management Programme (LAMP) and the District Development Programme (DDP) in Mara and Mwanza Regions. The aim was to create 2,000 new VICOBA groups and targeted 60,000 rural people in semi-arid and isolated rural areas of central, northern and southern Tanzania. By the end of the program 2,004 groups were operational in 6 regions with 9 million USD mobilised as compared to a targeted 6 million (ORGUT 2011). The VICOBA groups are based on groups of 25–30 participants, of which women often represent a majority. VICOBA training enables villagers to understand risks, interest rates, make business plans, calculate investment returns and instill an entrepreneurial mind set. Most VICOBA groups function as local investors in income generating activities such as warehouses, slaughter slabs, milling machines, cattle dips or water kiosks. Many VICOBA groups are linked to infrastructure provision as well as social services such as health insurance, conservation initiatives, livestock management and educational facilities (*ibid.*).

The most widespread and well-known microfinance institutions in Tanzania are the Savings and Credit Cooperative Societies, SACCOs, ranging from community-based initiatives recruiting members working in the informal economy to workplace-based SACCOs (ILO 2013).

### **Mapping the stakeholders**

Institutional innovation for agricultural purposes may involve a range of activities, including market and infrastructure, local organization as well as governmental intervention. Different organizations operate at different levels and may reach anything from a few individual farms or farmer groups to implementation schemes with regional or national coverage. In the first phase we look for qualities or models that best apply to the ideas of sustainable intensification, and thus a first round of mapping of actors/stakeholders will show great diversity in terms of range, perspective and reach. For structural overview, I have tried to organize the stakeholders according to their field activities in districts and villages rather than applying a sector-based (or value-based) logic. The idea is to get hold of which actors that operate side by side and may thus be potential collaborators (or negotiating partners) in the field. The disadvantage of this logic may be that difficulties may appear when taking things to scale, but a starting point must be that “what does not work at a small scale” is less likely to work at a larger scale.

The Kiteto and Kongwa research sites are put together to one potential “platform” as they share some common traits in relation to planned interventions by the FtF initiative/NAFAKA, while Babati will serve as a reference representing an agro-ecological transect within one district. At this stage, the stakeholders are identified and briefly presented in the tables below. The relations between stakeholders and potential for collaboration will not be explored here, but will follow in the outline of the research approach of the R4D platforms. It is however important to stress that several organizations or stakeholders operate beyond the district level, while others may have a very strong influence only locally. It is therefore not an assessment of potential overall impact of these organizations that are outlined here, but an initial step to identify possible linkages for successful collaboration. It goes without saying that the list and the presentation below of organizations and activities are not complete, but should be seen as a point of departure for the future work.

<b>Kiteto/Kongwa Districts, list of potential stakeholder organizations for Sustainable Intensification</b>				
<b>Project/activity Organization</b>	<b>Relevance to AR</b>	<b>Project period</b>	<b>Profile/current activities</b>	<b>Activities in AR project villages</b>
LAMP/Orgut	yes	1996-2008	Land management, water, community forestry, conservation agriculture, etc (Kiteto)	Njoro
CORDS		ongoing	Pastoralist land rights (Kiteto)	
NAFAKA	partner	ongoing	Agricultural innovation; Cereals, staple value chain	Njoro, Chitego, Laikala, Mlali, Moleti
District councils	partners	ongoing	Government extension	
MKURABITA	yes	ongoing	Property rights, land titling etc.	
Inades-Formation	yes	ongoing	Agriculture, health, governance, etc	Chitego, Laikala, Mlali, Moleti
LVIA	yes	1986-	Water, health, agriculture (oxenization etc)	Chitego
MVIWATA	yes	ongoing	Farmers association	Chitego
World Vision International	yes	ongoing	Agricultural innovation (Kongwa only)	
FARM-Africa	yes	2003-04	Cereal seed production, dairy goats	
SULEDO	yes	Since 1998	Village/community forestry (three wards in Kiteto)	
INTSORMIL		2005-06	Sorghum cultivars, seed production	12 villages (Kongwa)
ARI Hombolo	yes	ongoing	Research and extension	Njoro, Chitego, Laikala, Mlali, Moleti
Pasture Research Centre	yes	ongoing	Research	Njoro, Chitego, Laikala, Mlali, Moleti
Kibaigwa market	yes	ongoing	Crop market	Mlali, Laikala
SACCOs	yes	ongoing	Agricultural credit	Chitego, Mlali
Tanzania Official Seed Certification Agency (TOSCA)	yes	ongoing	Seed certification	Chitego
Tanzania Seed Company (Tanseed)			Seed production	
UDOM	partner		Research	Njoro, Chitego, Laikala, Mlali, Moleti
SUA	partner		Research	Njoro, Mlali, Moleti
PHILA (Post Harvest Innovation Learning Alliance)		2005-06	Post-harvest matters (Kongwa)	

<b>Babati District, list of potential stakeholder organizations for Sustainable Intensification</b>				
<b>Project/activity/organization</b>	<b>Relevance to AR</b>	<b>Project period</b>	<b>Profile/current activities</b>	<b>Level of activities or presence in villages</b>
LAMP/Orgut	yes	1989-2008	Land management, land use, forestry, water, etc	All villages
District council/Town council	yes	ongoing	Agricultural extension (government)	All villages
FARM-Africa	yes	1991 - ongoing	Dairy goats, simsim, Nou forest, soil conservation	Selective; Mbugwe, Bashnet and Babati Divisions
Selian ARI	yes	ongoing	Research & dissemination of improved technologies	
World Vision International	yes	ongoing	Support to sunflower, seeds and dairy sub-sectors	Gorowa and Mbugwe Divisions
Sasakawa Global 2000		1988-2004	Seeds, storage etc	
MVIWATA	yes	ongoing	Promoting farmers' networking/associations	All villages
Heifer Project International (HPI)		ended	Dairy cows (heifers)	Selected villages
FAO		ended	Promotion of fertilizer among small scale farmers	Selected villages
VICOBA's	yes	2008-ongoing	Promotion of credit systems for small scale entrepreneurs/farmers	Groups in 60+ villages
Tanzania Official Seed Certification Agency (TOSCA)	yes	ongoing	Seed certification	
TCCIA (chamber of commerce)		ongoing	Marketing information; product certificates	Business people and farmers
Tanzania Seed Company (Tanseed)			Seed production	
SACCOs	yes	ongoing	Agricultural credit	All wards
Tanganyika Farmers Association (TFA)	yes	ongoing	Provision/sale of farm inputs	Centered in towns
Friends in Development Trust (FIDE)	yes	ongoing	Agriculture, rural development	All divisions
TechnoServe	yes	ongoing	Marketing of pigeon peas	
Research, Community and Organizational Development Associates (RECODA)	yes	2010-2011	Farmer field schools sweet potato	Matufa + 4 other villages
Faida Market Link (Faida MaLi)		2003-ongoing	Sunflower, value chains, budget tracking, Purchase for progress (P4P)	Bashnet, Babati
Tanzania Agricultural Partnership (TAP)	yes	2010-ongoing	To identify gaps and to link farmers with other stakeholders (PPP); private sector involvement in agriculture	

ARI Hombolo – Agricultural Research Institute Hombolo, Dodoma

CORDS (Community Research and Development Services) – local NGO with pastoralist focus

FaidaMali – Faida Market Link

FAO (Food and Agriculture Organization of the United Nations)

FARM-Africa – British NGO

FIDE (Friends in Development Trust) - local NGO, Babati

HPI (Heifer (Project) International) - international NGO, based in the US.

Inades-Formation International (Réseau de Solidarité et d'accompagnement des initiatives de développement des populations défavorisées) – International NGO, based in Ivory Coast

INTSORMIL - The International Sorghum and Millet Collaborative Research Support Program, supported by USAID

LAMP (Land Management Programme) - a long term development programme financed by Sida in Babati, Simanjiro, Kiteto and Singida Districts

LVIA (Associazione internazionale volontari laici) – Italian NGO; projects on agriculture, health and water, Kongwa

MKURABITA (Mpango wa Kurasimisha Rasilimali na Biashara za Wanyonge Tanzania)

MVIWATA (Mtandao wa Vikundi vya Wakulima Tanzania) - a national farmers’ organization

NAFAKA – Cereal Staples Value Chain, implementation programme, financed by USAID

Orgut – an international consultancy firm, responsible for the implementation of LAMP

Pasture Research Centre (Kongwa)

PHILA (Post Harvest Innovation Learning Alliance) - a network for post-harvest matters funded by the United Kingdom Department for International Development (DfID)

RECODA (Research, Community and Organizational Development Associates)

SACCOs (Savings and Credit Cooperative Societies)

Sasakawa Global 2000

Selian ARI – Selian Agricultural Research Institute, Arusha

SUA – Sokoine University of Agriculture, Morogoro

SULEDO – Community forest project, Kiteto

Tanseed - Tanzania Seed Company

TAP (Tanzania Agricultural Partnership)

TCCIA (Tanzania Chamber of Commerce Industry and Agriculture)

TechnoServe – international NGO

TFA (Tanzania Farmers’ Association)

TOSCA (Tanzania Official Seed Certification Agency)

UDOM – University of Dodoma

VICOBA – Village Community Banks

World Vision International – an international Christian relief, development and advocacy NGO

## Conclusions and recommendations

This background paper is based on analysis of previous research and agricultural development interventions in the three districts of Kiteto, Kongwa and Babati in central Tanzania. At this point, the background material for analyzing the potential of sustainable intensification is scarce, in spite of numerous research and development activities in these areas over the last decades. An important challenge for Africa RISING is to establish, in collaboration with its partners, a firm base of agro-ecological as well as socio-economic data, in order to inform further interventions at systems level. The focus of these interventions needs to align to a demand-driven approach that addresses the potential for sustainable intensification. The three districts share a number of challenges of diminishing rainfall, poor soil fertility and continuous population growth, all of them drivers for finding sustainable solutions to food security problems. Two factors are at the heart of sustainable intensification, namely labour input and secure access to land. The situation in relation to these factors varies considerably between the districts, where the process of land titling and individual certificates is well underway in Babati, but still in its infancy in Kiteto and Kongwa. In Kiteto, land is still abundant, and it is a challenge to introduce more intensive practices, in an environment that is still considered as a frontier for agricultural expansion. In Kongwa, on the other hand, it is urgent to address access to drought-tolerant varieties and related post-harvest and pest management practices. Focus on landscape level processes of water management, soil erosion and land use management should be a priority in all of the three districts.

The variations within the districts are considerable, regarding agro-ecological as well as socio-cultural conditions, which calls for careful analysis of entry points and suggested interventions in relation to relevant target groups (and target environments). Pathways for the sustainable integration of livestock in agricultural systems is a particular challenge that needs to consider a whole range of factors for a transition from traditional land use and livelihood patterns to more intensive and highly integrated systems.

As soon as a reasonable base-line is available, the work to initiate and establish local multi-stakeholder platforms should be a priority. Research on appropriate technologies and practices, market linkages and institutional innovations can then be matched with the establishment of an enabling environment for demand-driven experimentation, capacity building and continuous dialogue and negotiation at the local level.

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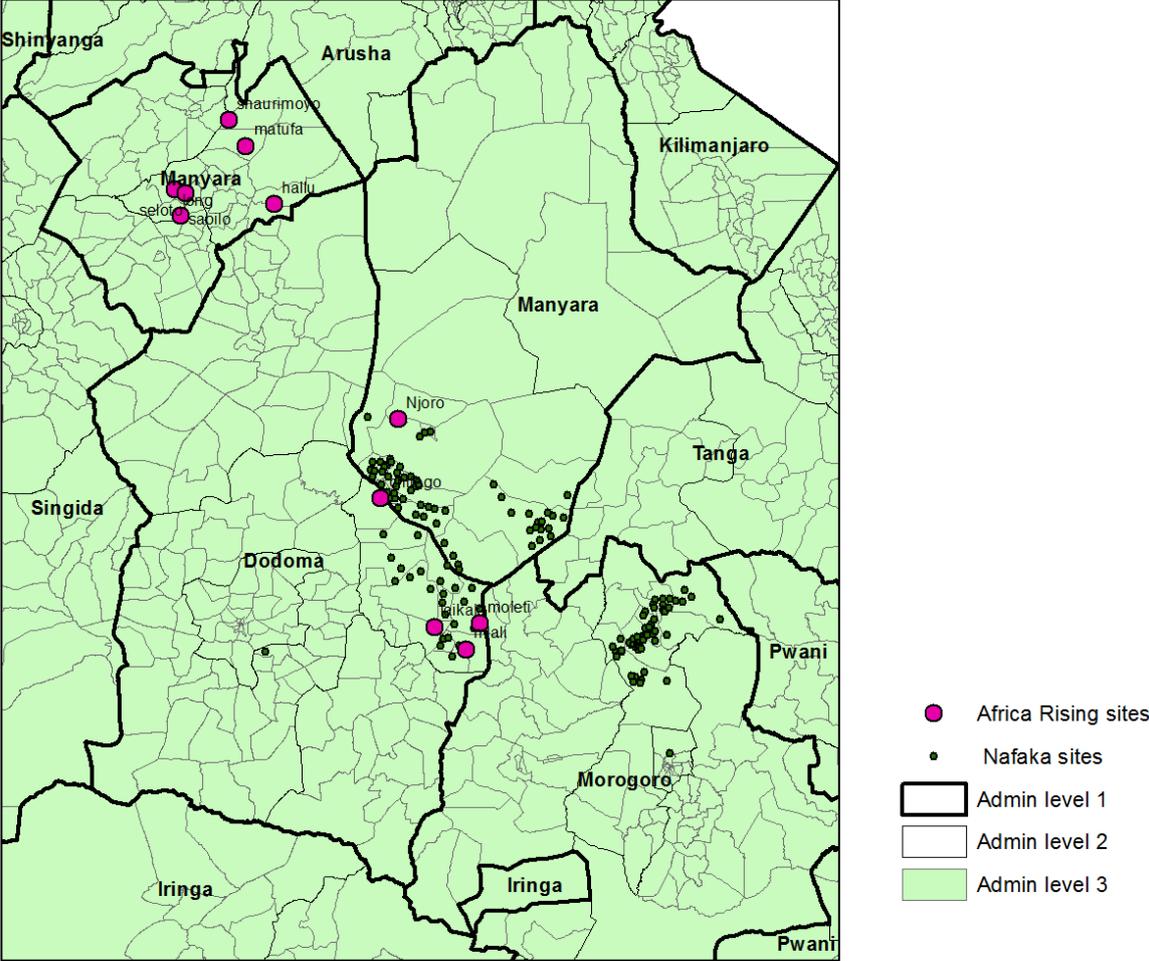
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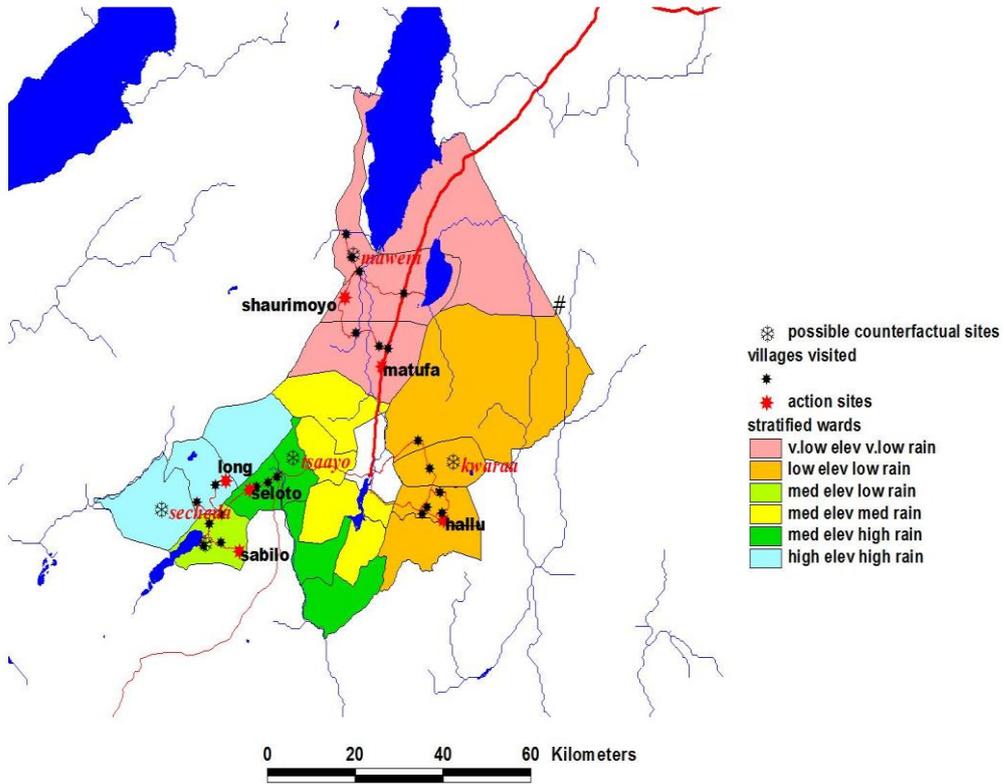
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**ANNEX 1: MAPS SECTION**



Tanzania Africa RISING Action Sites		
Region (=2)	District (=3)	Village (=11)
Manyara	Babati	Long; Sabilo; Seloto; Hallu; Matufa; Shaurimoyo
	Kiteto	Njoro
Dodoma	Kongwa	Chitego; Moletu; Mlali; Laikala



**Map 2.** Map of Babati district showing the main agro-ecological zones. The project villages/action sites of Africa RISING are indicated by red dots (Bekunda 2012)

## **ANNEX 2: Terms of Reference**

The Terms of Reference are as follows:

- I. Identify the economic, social and institutional constraints to the adoption of agricultural technologies and institutional innovations in ESA Project Areas, Tanzania.
- II. Undertake an assessment of the legacy of selected research and development projects in the Africa RISING –ESA Project study districts of Babati, Kongwa and Kiteto in Tanzania
- III. Advise terms to be adopted for the engagement of various research and development partners for effective interactions to prioritize, guide, evaluate and scale research and development (R4D Platforms) for SI (sustainable intensification) in the selected areas.
- IV. Draft a research plan to develop the understanding of the economic, social-cultural and institutional constraints that could affect technology adoption, for the purpose of consideration during the 2013/14 ESA Project Planning meeting (September 2013)
- V. Link up with potential additional sources of funding for Africa RISING.
- VI. Present draft research plan (item 4) at the ESA Project Planning meeting in September 2013.
- VII. Amend research plan by considering feedback received at the meeting.

The deliverables are as follows:

- Background paper: Opportunities for adoption and institutional innovation in Africa RISING Tanzanian research sites (items 1-3), completed July, 31, 2013.
- Draft research plan for research on institutional innovation and scaling issues in Africa RISING (item 4), completed August, 31, 2013.
- PowerPoint presentation of suggested research (for item 6), completed August, 31, 2013.
- Completed research plan after feedback from management/meeting (item 7), completed September, 30, 2013.