

TOWARD INCLUSIVE AGRICULTURE- LED ECONOMIC TRANSFORMATION OF THE NORTHERN SAVANNAH ZONE OF GHANA

Lifting the Savannah, Lifting Ghana



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Savannah Accelerated
Development Authority





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FOREWORD

The SADA Zone holds major agricultural promise that – when harnessed – will not only make the country highly secure and less dependent on imports, but more importantly transform the lives of the zone's inhabitants quite significantly -- the zone currently records lower performances in all major indices of socio-economic performance compared to the national average,” Charles Abugre, CEO, SADA. From Commercial Agriculture Investment Guide: The Northern Savannah Ecological Zone of Ghana, published by SADA.

“The vision of SADA is to see a transformed Northern Savannah Ecological Zone; a place of opportunity and free from poverty. SADA aims to achieve this vision through coordination, collaboration and facilitation. SADA's key values are: Sustainability, Professionalism, Integrity and Accountability, Respect for Diversity and Gender, Impact, and Trust.” Charles Abugre, CEO, SADA. From Commercial Agriculture Investment Guide: The Northern Savannah Ecological Zone of Ghana, published by SADA.

“The agricultural potential of the SADA Zone, mainly its large-scale irrigation possibilities, is largely untapped. The SADA Zone with at least 8 million unused or underutilized ha of agricultural land with highly suitable soils, is open for a massive utilization of the regions land and water resources for large-scale irrigated farming, development of modern agro-industry value chains, including vegetable oils, rice, sugar, cotton, cassava, shea, high value tree crops and vegetables among others. There are at least USD 2 billion in annual food imports that can be substituted with domestic production, including rice, sugar, chicken meat, and edible oils.” From Commercial Agriculture Investment Guide: The Northern Savannah Ecological Zone of Ghana, published by SADA.

“SADA's priority focus includes Agricultural Modernization, Infrastructure and Irrigation Development, Development of Manufacturing and Industrial Zones, Mining and Natural Resource Development, Urban Modernization, Investment Promotion, and Business Facilitation and Stewardship. SADA stands ready to support every investor; to work with other state organizations to navigate the necessary regulatory processes to be able to realize their objective of successful investment in the SADA Zone.” Charles Abugre, CEO, SADA. From Commercial Agriculture Investment Guide: The Northern Savannah Ecological Zone of Ghana, published by SADA.

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BACKGROUND

The Savannah Accelerated Development Authority (SADA) has been undertaking a process to develop a long-term Regional Development Plan that includes Regional and Agricultural Masterplans for development of the SADA Zone; including projections for the next 30 years.

This booklet is a synthesis of several documents published by SADA since January 2016. These documents synthesize and summarize findings of numerous scientific research studies and consultations with stakeholders; as part of the preparation of the *Northern Savannah Transformation Program*.

Consultations have been held with numerous stakeholders in numerous places. The key question addressed was: "What needs to be done, prioritised or done differently, in order to harness the vast resources of the zone to accelerate development, transform the zone, eliminate extreme poverty and bridge the development gap in an environmentally sustainable way in the shortest possible time"?

Drawing upon the Masterplan Concept Note (published in January 2016) and numerous background studies, SADA's Regional and Agricultural Masterplans were finalized in July 2016, and summary reports were published. In addition, SADA has published a Commercial Agriculture Investment Guide. Visit the SADA website for weblinks to the various publications.

In addition to preparation of the Regional and Agricultural Masterplans that present a long-term vision and strategy, SADA organised an Agricultural Investment Workshop (AIW) in June 21-23, 2016 in Accra with the objective to identify a "Road Map" of short-term priorities and recommended actions that are deemed to be necessary to achieve the long-term objectives of the Masterplans. The SADA AIW included many stakeholders from public and

private sectors and civil society, and with His Excellency President John Mahama participating in the closing session. The key questions addressed were: a) What is needed to make the SADA Zone attractive for private sector investments, b) How can Ghana achieve *inclusive agricultural-led economic transformation of the SADA Zone*, and c) What are the "low-lying" short-term solutions and actions to achieve long-term objectives? The key output of the workshop was a "Road Map" of recommendations for agricultural-led economic transformation of the SADA Zone. See the SADA website for weblinks to the workshop agenda, participants, presentations, and the Road Map presentation received by H.E. President John Mahama.

This booklet is part of the "process" to develop a comprehensive Agricultural Development Program for agriculture-led economic transformation of the SADA Zone; that is multi-sectoral and coordinated with development partners and Government. This document can be viewed as a being based on a broad "consensus", since it is the result of a long consultative process with thousands of stakeholders.

Please visit the SADA website www.sadagh.org

1.0 INTRODUCTION:

PLANNING FOR AGRICULTURE-LED ECONOMIC TRANSFORMATION

The Savannah Accelerated Development Authority (SADA) was established in 2010 by the Government of Ghana as an independent and autonomous institution to provide a framework for the comprehensive and long-term development of the Northern Savannah Ecological Zone (NSEZ). The NSEZ or “SADA Zone” includes Northern Region, Upper East Region, Upper West Region and (since 2014) the bordering northernmost districts of Brong Ahafo Region and Volta Region. See Figure 1.

The need to establish SADA was inspired by Article 36 (2) (d) of the 1992 Constitution which enjoins Government to pursue balanced development of the Country. The Northern Savannah Ecological Zone of Ghana despite being replete with resources is the poorest and most underdeveloped part of Ghana. SADA was therefore established by the SADA Act, 2010 (Act 805), to provide a framework for the comprehensive and long term development of the NSEZ.

To ensure accelerated and integrated development of the NSEZ, SADA is also mandated to mobilise human, financial and other resources, and to coordinate existing and future development projects (by Government, donors, NGOs) and related policies (national and local) with a view to ensuring coherence in project planning, policy-making, and implementation.

Most of the SADA Zone can be classified agro-ecologically as semi-arid Guinea-Savannah Zone. The SADA Zone covers about 54% of Ghana's territory, and is home to about 25% of its population. However, the poverty rate in the SADA zone is over 40%; about double the national average. The SADA zone is a lagging region because of its relatively challenging agro-ecological conditions, low socio-economic indicators, and historical neglect in public investment in infrastructure and services.

BOX 1: ROLES OF SADA

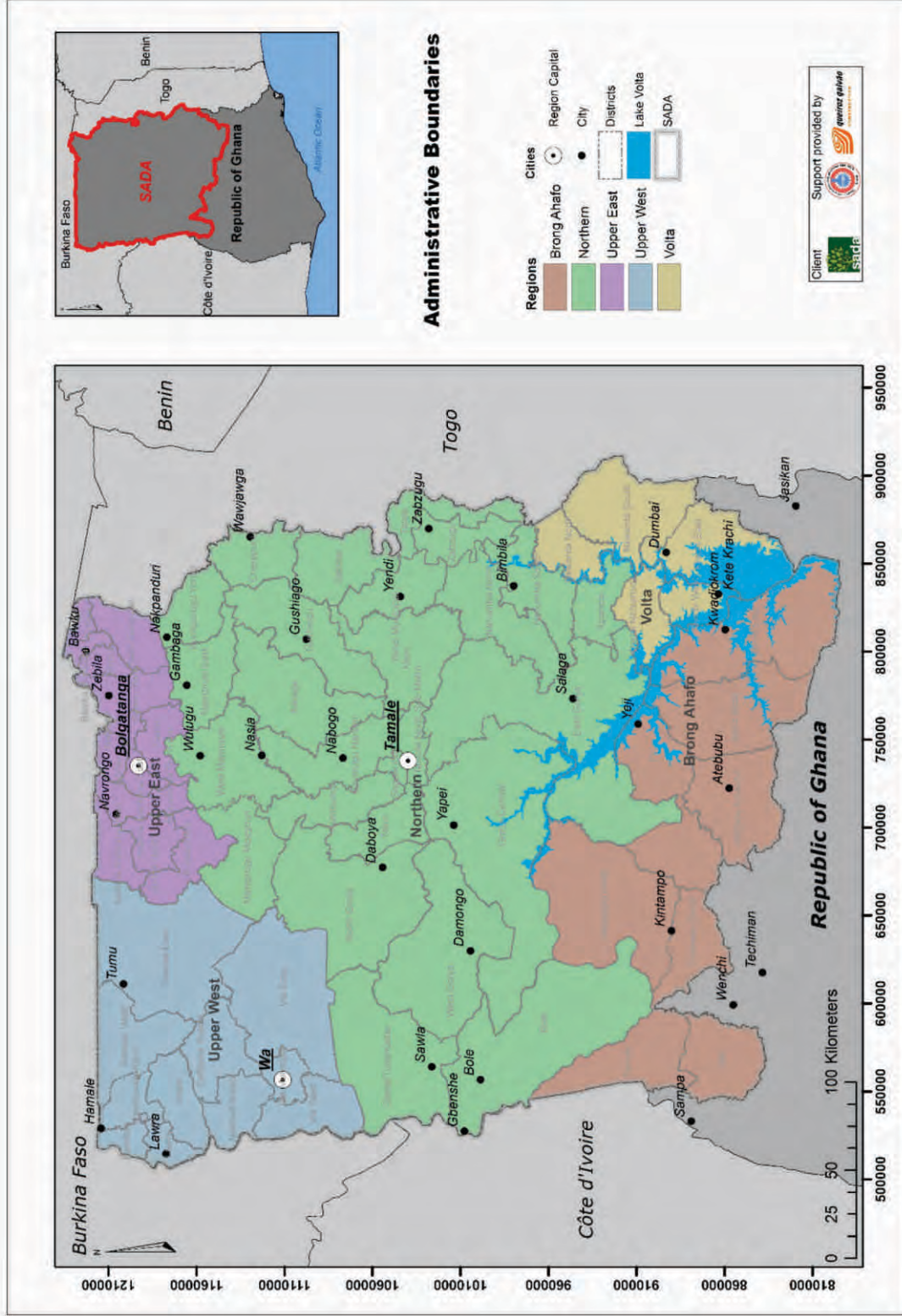
SADA is the key Government Authority for coordinating, facilitating, catalysing and implementing development projects, both with public and private players. SADA is consolidating its mandate as a *one-stop-shop* centre for investors in the Northern Savannah Ecological Zone (NSEZ) and, in that regard, it can play a number of roles including bureaucracy facilitation, land acquisition, engagement with key Government Authorities, and others. SADA delivers its core objectives by facilitating, catalysing, collaborating, coordinating and assisting any development or private investment projects across its area of influence. It is a “problem solving institution” and hand-holds its partners to ensure that the investments are successful in terms of jobs and social impacts on the people.

From Commercial Agriculture Investment Guide: The Northern Savannah Ecological Zone of Ghana, published by SADA.

See: www.sadagh.org

Development and socio-economic indicators in the north of Ghana lag behind the south, and one of SADA's objective is to close the gap. However, in reality development of the SADA Zone is not just about improving socio-economic outcomes in the SADA Zone. In fact, development of the SADA Zone is a national imperative for Ghana's balance of payments, macroeconomic stability, economic growth, food security, jobs, and poverty reduction. Thus, the motto for SADA's recently launched *Northern Savannah Transformation Program* is “Lifting the Savannah, Lifting Ghana”.

Figure 1: SADA Zone Political Regions And Districts



Source: Resources and Masterplan for the Transformation of Agriculture in the SADA Zone

BOX 2: POVERTY IN NORTHERN GHANA

According to the World Bank (2011) report on *Tackling Poverty in Northern Ghana*: “the majority of Ghana's poor live in Northern Ghana, where the poor are also poorer. Participatory and quantitative assessments describe a situation where the poor in Northern Ghana are predominantly rainfall-dependent farmers. These farmers are highly vulnerable to shocks given the limited diversification of their income sources. While the poor have little education, increases in education in Northern Ghana do not seem to have provided greater livelihood opportunities. This is reflective of the absence of better off-farm opportunities in these regions. To cope with the various shocks to which they are exposed (floods, droughts, insects, diseases, conflicts – all of which are preventable with relevant infrastructure, public services, insurance and conflict resolution mechanisms) the poor tend to mortgage their prospects to eventually escape poverty by depleting their human and physical capital and adopting risky behaviours, including child migration or illegal artisanal mining.”

<http://documents.worldbank.org/curated/en/445681468030627288/Tackling-poverty-in-Northern-Ghana>

Significant economic disparity exists between the northern and the southern regions of Ghana. In the Northern Region 10% of households are food insecure, almost three times the national average, and more than 33% of children under five have been recorded as stunted. Local governments are limited in their ability to provide public services by long distances between communities, low population density and poor quality of infrastructure. Women in Northern Ghana are especially vulnerable as they face gender inequalities that restrict their full participation in the country's development, including limited access to and control over resources, access to education and services, and participation in decision making.

From: USAID Brief for the Resiliency in Northern Ghana (RING) Project.

As part of the preparation of the *Northern Savannah Transformation Program*, SADA has been undertaking a highly participatory process to develop a long-term Regional Development Plan that includes Regional and Agricultural Masterplans for accelerated development of the SADA Zone. SADA has been preparing the masterplans in coordination with the National Development Policy Commission (NDPC) and the Ministry of Food and Agriculture (MOFA), and in consultation with stakeholders.

SADA's Regional Masterplan includes spatial planning for the entire SADA Zone, and planning of two cities (Tamale and Buiepe). The Regional Master Plan focuses attention on development of urban centres in the SADA Zone to best facilitate an agricultural-led economic transformation.

According to SADA's Regional Masterplan, the key strategy for the SADA Zone is that economic diversification is needed to achieve more accelerated and sustainable growth. The economic diversification strategy entails enhancing the agricultural sector, along with expanding the services and manufacturing sectors to contribute to greater economic growth. This is to tap into the opportunities arising from the increasing demand of domestically produced consumer products, particularly from the expanding middle class in Ghana, as well from the growing demand from the exports market around the immediate neighbourhood in ECOWAS region.

Agriculture remains as an important sector for the SADA Zone given its existing capabilities and high potential. However, it needs to be more diversified and productive; potentially through larger farms, encouraging private-sector participation, enhancing skills in agricultural management, and developing supporting infrastructure in areas such as irrigation, water and yield management. The agricultural sector will also be coupled with agro-processing such that the downstream processing will value add the agricultural products which ultimately becomes an integral part of the industrial sector. Agri-business cuts across agricultural value chains via production, processing, marketing, services, etc.

Manufacturing would be encouraged and supported by providing investors with appropriate incentives so that surplus agricultural labour can be actively employed. In the short term, low and intermediate value added manufacturing activities in areas such as textiles, light assembly, and packaging can potentially absorb semi-skilled labour with basic training in production methods.

To develop the manufacturing sector in the medium-term, a sequential approach should be adopted by starting with a focus on agro-processing and then widening the industrial space to other products and production technology, alongside the development of technical training colleges to support the supply of skilled and semi-skilled workers in these areas.

The services sector further plays a key role in the economic diversification of SADA Zone, which include logistics, finance and business, retail and tourism, healthcare, education and the public sector. Ultimately, the elements that constitute the three thrusts has to be seen integrated as a coherent and efficient strategy for the transformation of the Zone, as well as to facilitate a seamless and self-augmenting policy design to catalyse economic growth.

The Agricultural Masterplan includes spatial planning of 6 Agribusiness Development Zones that specialize in different agricultural value chains. The core purpose of this process is to find answers to the question: "What needs to be done, prioritised or done differently, in order to harness the vast resources of the zone to accelerate development, transform the zone, eliminate extreme poverty and bridge the development gap in an environmentally sustainable way in the shortest possible time"?

SADA believes that the Zone can transform rapidly, if it is adequately positioned and backed by supportive public investments and policies. It is envisioned that within 25 years the SADA Zone there will be a highly diversified economy transformed by productive and competitive agriculture and agro- industries and services that transform incomes and landscapes that boost the rural economy, and that are closely linked to urban areas and markets. It is important to note

that agricultural development of Ghana's Northern Savannah – with a focus on developing irrigated agriculture – an aspiration of Ghana ever since independence. As such, there are numerous existing analyses and reports on the natural resource base and agricultural potential for the SADA Zone.

The planning process undertaken by SADA has been a mix of consultations (meetings and on-line), review of literature, high level technical support organised in advisory committees, and foreign technical assistance, all providing inputs into Regional and Agricultural Masterplans. The multi-stakeholder consultation process includes the National Development Planning Commission, representatives of different political parties, members of parliament, traditional authorities, business leaders, civil society organisations, professional organisations, metropolitan, municipal and district assemblies, development partners as well as thematic sectors.

The consultation process was designed to ensure as much input as possible by the diverse stakeholder groups that will be affected by the results of the Regional Development Plan; to ensure the relevance of the plan and buy-in from a diverse range of stakeholders in public and private sectors, and civil society. The process is also technical; drawing upon both foreign and local technical experts in joint efforts.

BOX 3: MASTERPLAN CONSULTANTS

Surbana International Consultants ("Surbana") is a Singapore-based firm with expertise in urban and regional planning, and have been working with SADA on the Regional Masterplan.

Queiroz Galvão is a Brazil-based firm that specializes in engineering and construction (including the new Tamale airport). They are working with SADA on the Agricultural Masterplan, drawing upon the experience of transformation of the semi-arid Cerrado region in Brazil. *Queiroz Galvão* also is involved in infrastructure investments for commercial agriculture. *Queiroz Galvão* also provided support for this publication.

SADA's Regional and Agricultural Masterplans highlight the potential for agriculture-led economic transformation and links within rural areas, and between rural and urban economies. SADA's Regional and Agricultural Masterplans articulate a vision and identify game-changing investments and actions to attract and channel public and private investments to transform the SADA Zone into Ghana's green economic hub and gateway to the Sahel in an inclusive manner so that no one is left behind.

The planning process is based on the premise that it will require multiple, strategic, simultaneous and coordinated investments and interventions to create and sustain conditions to grow and diversify the economy and improve public services radically enough end extreme poverty and close the development gap between northern and southern parts of Ghana. The long-term development strategy will be formulated in a spatial context, with identification of high-potential areas for select agricultural value chains.

The planning process is also an opportunity to strengthen partnerships and collaboration with other parts of government and clarify and Strengthen SADA's mandate. Since the National Development Planning Commission (NDPC) has ultimate responsibility and mandate for development planning and coordination - SADA's mandate in these areas is derived from the National Development Planning System Law – the NDPC has a lead role in the SADA planning process. SADA has also been working with the Town and County Planning Department (TCPD) to develop a “spatial development framework” for the SADA Zone.

BOX 4: SADA VISION, GOALS, AND OBJECTIVES: GREEN ECONOMIC HUB OF GHANA AND THE GATEWAY TO SAHEL

Vision: A vibrant and resilient middle income economy that is:

Green Economic Hub of Ghana: To fully utilize the advantages in developing agriculture and to ensure the SADA Zone is environmentally, socially and economically sustainable with its rapid growth and urbanization.

Gateway to Sahel: To fully capitalize on the strategic location of NSEZ as the Gateway to Sahel and to seize the opportunities that arises.

Goals: To realize the vision, three goals aiming at economic, social and environmental sustainability were formulated:

Develop a vibrant and resilient middle income economy;

Establish a harmonious and smart community to live in; and

Create attractive, sustainable and clean living environment.

Build catalytic, responsive and accountable institutions

Promote sub-regional environmental, economic and cultural cooperation

Objectives: Targeted objectives include achieving GDP per capita of greater than USD 4,000; developing resilient and diversified economy; and ensuring unemployment rate of less than 10%.

For harmonious and smart community, the objectives are targeted at achieving urban-rural income disparity of less than 20%; attaining more than 60% of workforce as skilled workers; and ensuring key social facilities are accessible within 100 km radius. For attractive, liveable and sustainable environment, the objectives are targeted at developing flood free region; ensuring zero net loss of forest areas; increasing use of renewable energy as at least 20% of total energy supply; and developing cleaner cities and region

2.0. AGRICULTURAL POTENTIAL AND CONSTRAINTS IN THE SADA ZONE

In this section we highlight the agricultural potential of the SADA Zone and also the constraints that need to be addressed to achieve that potential. This section mostly draws upon SADA's Agricultural Masterplan and the SADA AIW Road Map.

Despite numerous constraints and challenges, based on international experiences in countries with similar conditions, it is widely agreed that the SADA Zone has huge agricultural potential. Thus, the SADA Zone should be viewed as a “diamond-in-the-rough” to be polished and an “economic reservoir” to be tapped. Section 3 highlights some lessons learned from international experiences in agricultural-led economic transformation under similar semi-arid Savannah conditions to the SADA Zone.

2.1 POTENTIAL FOR AGRICULTURAL-LED TRANSFORMATION OF THE SADA ZONE

The potential exists for the SADA Zone to develop as a hub in the region with respect to transport and logistics (including ICT) within Ghana, and with neighbours. The SADA Zone (especially its urban centres) has potential as a market hub for raw and processed agricultural inputs and outputs. There is potential for agriculture (i.e., crops, trees, and livestock) and aquaculture. In particular, there are major import substitution opportunities that focus on domestic markets (in the SADA Zone and other parts of Ghana) based on current and/or new types of crops, trees, livestock, and fish.

Though most of the SADA Zone is semi-arid, three of the Volta River's main tributaries – the White Volta, the Black Volta and Oti River -- flow permanently through the zone, and if combined with a strategy to harvest portions of the 40 billion cubic meters of annual run-off water, offer great potential for irrigation. Thus, the SADA Zone is a “diamond-in-the-rough” that can be polished and an economic reservoir with improved land/water

management. SADA's Agricultural Masterplan indicate that with improved infrastructure, including expanded irrigation, there is considerable potential to increase yields and cropping cycles of existing crops and introduce new crops, livestock, and aquaculture; and associated processing. The area is particularly suitable for maize, rice, tubers (cassava, yam) and soybeans – especially under irrigation - as well as the traditional (rain-fed) coarse grains such as sorghum and millet. There is also potential for horticultural crops (fruits and vegetables, and ornamentals). Many parts of the area are also suitable for livestock (large and small), and there is potential for aquaculture.

The SADA Zone is blessed with vast lands and valleys, crisscrossed by rivers suitable for commercial agriculture, irrigation, hydropower and water transport which combine to stimulate agro-processing; immense deposits of unexploited minerals suitable for a wide array of industries, including minerals that can support agriculture (e.g., lime). Also, the SADA Zone is predominantly lowland and flat. Since mechanized (and irrigated) agricultural production prefers flat areas for greater efficiency, the SADA Zone is therefore very suitable for mechanization.

There is a need to capitalise on the enormous irrigation possibilities in the SADA Zone, which are currently largely untapped. Almost every part of the SADA Zone is suitable for one type of crop under irrigated conditions. Extensive irrigation schemes all across the zone have the potential to increase suitable agriculture land area by 3 to 4 times. Moreover, irrigation would greatly improve the yields of crops already suitable under rain fed conditions (see Figure 2).

One of the key findings of SADA's Agricultural Masterplan work is that there is tremendous potential for accelerated commercial agriculture modernization based on the intensive use of irrigation infrastructure and 5 climate-smart agriculture technologies to support broad-based

economic and social transformation, climate change resilience and adaptation. Sustainable commercial agriculture development will be a catalyst to open up possibilities for dynamic agricultural value chains across the zone, opening space for private investment upstream and downstream of farm level production.

Commercial, irrigated agricultural development is viewed as the most important key to unlock the SADA Zone's potential. Implementing the policy, technology and infrastructure propositions set forth in the Agricultural Masterplan of the SADA Zone and the AIW Road Map recommendations will be instrumental for paving the way for agriculture-led transformation of the zone.

There are many opportunities for agricultural production and processing in the SADA Zone, and considerable potential exists for an agriculture-led transformation of the Zone. But, there are also many constraints that must be addressed. Some of the constraints are related to natural conditions (e.g. climate, soil quality, water resource availability) and locational factors, and others are related to policies and the overall business environment and cost of doing business. These constraints facing the SADA Zone can be addressed by appropriate investments and policy changes, as evidenced in other countries with similar conditions.

A component of the Agricultural Masterplan is the *Commercial Agriculture Investment Guide*, published by SADA, and launched in January 2016. The guide draws attention to the natural resources of the SADA Zone for commercial agriculture development based on findings of the Agricultural Masterplan. The Guide brings detailed information on the climate, water resources and soils of the SADA Zone, in addition to highlighting the results of the land suitability analysis for 25 crops, livestock, aquaculture and forestry. It also brings information on 5 large-scale irrigation schemes, over 100 small dam sites for small and medium-sized irrigation, hydropower schemes, in addition to detailed information on the investment process in Ghana.

BOX 5: USAID PUBLICATIONS ON AGRICULTURAL POTENTIAL OF THE SADA ZONE

USAID has published two publications that identify agribusiness opportunities for international and domestic investors in the SADA Zone. There are opportunities for large, medium, and small enterprises. The *SADA Districts Investment Opportunities* (2015) co-published by SADA and USAID provides detailed information for potential investors on the agricultural (and forestry, tourism) potential of each of the 63 districts, and *Agribusiness Opportunities in Northern Ghana* (2016) which presents 30 commercially viable agribusiness investment and financing opportunities tied to staple crop production in the northern regions. There is a wide range of agricultural value chains that are identified, and opportunities to invest in improving/expanding existing enterprises and facilities and/or new ones.

See: www.ghanalinks.org the Electronic Library.

2.2 CONSTRAINTS FACING AGRICULTURAL-LED TRANSFORMATION OF THE SADA ZONE

Unfavourable natural conditions: the SADA Zone is a Guinea-Savannah Zone with challenging climatic conditions. There is limited and uncertain rainfall during a single rainy season, droughts and floods, high temperatures and evapotranspiration, and vulnerability to bushfires. Also, in general, there is low natural soil fertility and water-holding capacity.

Climate: The SADA Zone is characterized by year-round warm temperatures and abundant sunshine, which is conducive to production of various crops. A major constraint is the erratic (and sometimes insufficient) rainfall pattern. Rainfall has a unimodal pattern, with a wet season from May to September, and a dry season from October to April. Even though rainfall is enough for most annual crops (grains, short-cycle vegetables), most of the SADA zone is limited to

single-cropping, and perennial crop farming is very challenging. Irrigation systems, however, can be developed through the harnessing of surface and ground water, as a complimentary or full management technique. Climate change is an increasing concern for the SADA Zone, especially if there is less and more erratic rainfall, and higher temperatures. Climatic conditions also have an impact on diseases and pests facing crops, livestock, tree crops; and also humans. In all cases, it is important to address climate change (see Box 6)

Soil Quality: In general, soils in the SADA Zone are suitable for a wide range of land utilization types, including arable farming, forestry and perennial crops. However, constraints of main soil types are low natural fertility, high acidity, sandy topsoil texture, and clay hardpans starting at 20-40 cm depth. These constraints can be mostly overcome by appropriate land use practices in combinations with high input packages (e.g., application of lime, fertilizer packages), and by improved irrigation and land-water management.

Land Suitability: Using the Agro-ecological Zones (AEZ) methodology, developed by the Food and Agriculture Organization of the United Nations (FAO), land suitability analysis for the SADA Zone was undertaken for 25 crops under rain-fed and irrigated conditions, livestock (suitability for forage legumes, improved pasture – grasses and rangeland), agroforestry and planted forests and commercial pond aquaculture. Irrigation can dramatically transform the agricultural landscape in the SADA Zone by substantially expanding the area of land suitable for agriculture, and also by increasing yields by shifting from rain-fed to irrigated conditions in selected crops (mainly rice and sugar cane). See Figure 2.

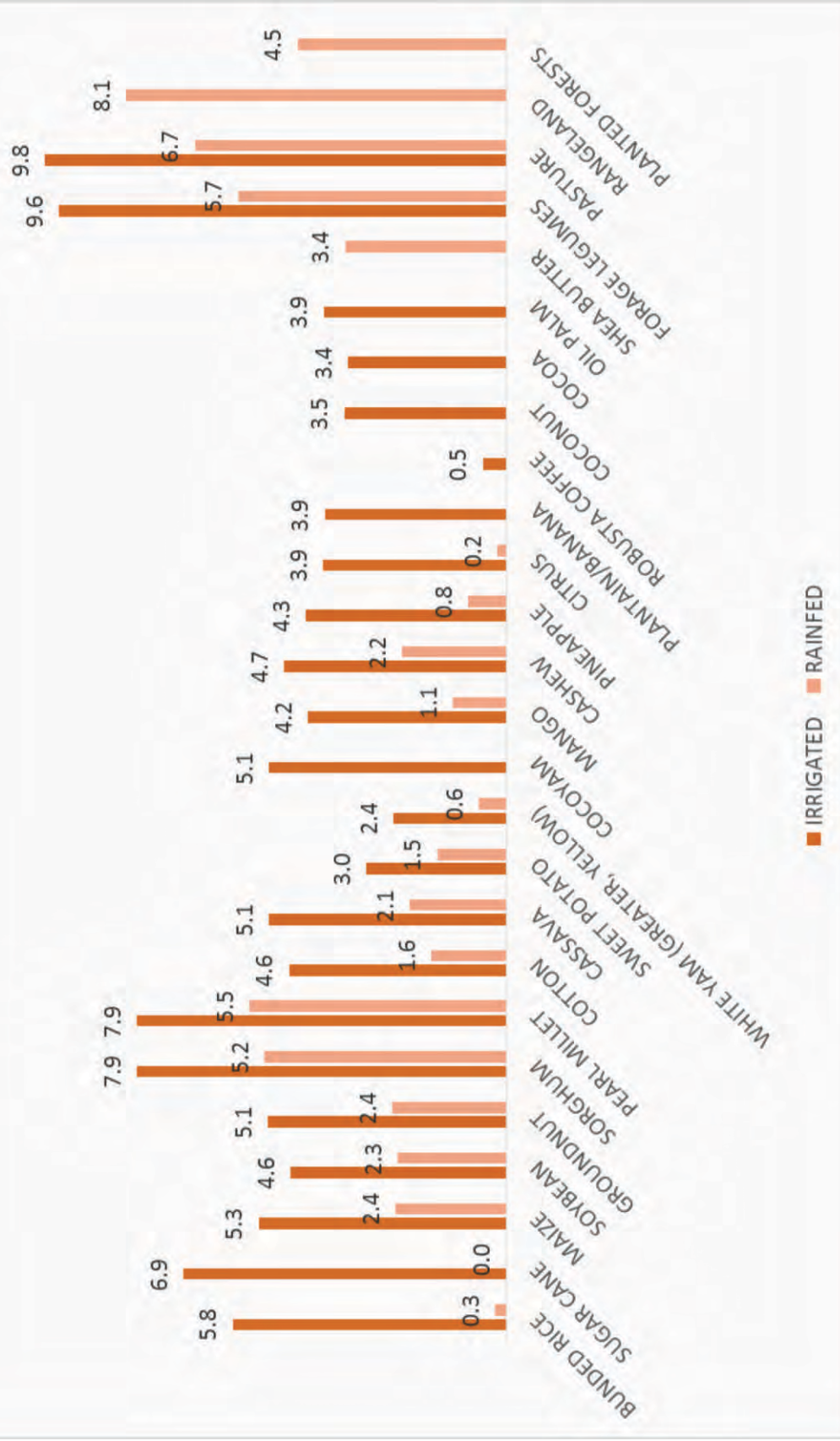
Water Resources: The availability of water resources is a major strength of the SADA Zone. The constraint is accessing the available water resources. Irrigation schemes operate at only one third of their capacity. There is more than 40 billion m³ of water in annual, renewable run-off from three major water basins (Black and White Voltas, Oti River) and several minor (sub) basins (Daka, Nasia, Kulpawn, etc.). To maximise access and use of the water resources for year-round irrigation and power production, there will be a

need to build a number of dams, water harvesting structures, ponds and dugouts. There is a need for more knowledge about underground water resources so that a clear understanding of potential and limitations of increased irrigation can be factored into project development. Similarly, a strategy for the protection of the river basins needs to be developed.

BOX 6: ADDRESSING CLIMATE CHANGE

Addressing the challenges posed by climate change while increasing the economic attractiveness of agriculture are strategic imperatives for commercial agriculture development in the SADA Zone. Along with other objectives (such as multi-hazard risk management that is linked to social protection and disaster management), climate-smart agriculture is a key component of SADA's vision for sustainable agriculture and agribusiness development enshrined in the Agricultural Masterplan.

Figure 2: Comparisons of Extents of Suitable Land (very Suitable, Suitable And Moderately Suitable) For Crop Production Under Rain-fed And Irrigated Conditions (million Ha)



Source: Resources and Masterplan for the Transformation of Agriculture in the SADA Zone

Remoteness from markets and inadequate infrastructure: the SADA Zone covers a large land area with relatively low population density and a corresponding lack of productive infrastructure with respect to roads, power, irrigation, information and communication technology (ICT), and social infrastructure. In recent years there have been improvements in some of the major north-south and east-west transportation routes, but there still is a lack of track roads and feeder roads to main roads and markets (and a lack of suitable vehicles). There is a notable lack of consistent power supply, and also a lack of appropriate quality power (e.g., 1-phase vs. 3-phase electricity supply). Having a power supply with consistent and appropriate quality is key for agro-processing and also for irrigation.

With respect to irrigation, there is poor utilization of existing irrigation systems, and a lack of farm and community-based water harvesting systems. Improved access to ICT, including mobile phones and internet are also critical, along with access to radios. There is also a lack of quality sheltered warehouses and hygienic efficient markets with suitable storage facilities. Besides the lack of productive infrastructure, there is a lack of social infrastructure such as lack of schools, health clinics, shops, entertainment for rural residents in the SADA Zone. The lack of social infrastructure, in addition to productive infrastructure, makes out-migration an attractive option, especially to youth.

Unconducive investment climate: it is difficult to attract private sector investment to the SADA Zone because the investment climate is not conducive. There are complicated and sometimes conflicting relationships between policies and bureaucratic processes. That is, policies might be clear, but there are often bureaucratic processes (e.g., rules and regulations, need for permit), that impose extra costs and risks. As will be discussed later in the section on access to land, there are cumbersome processes for acquiring land, and also for enforcing land contracts. Also to be discussed later is also difficulty to access high yielding seeds and other inputs in a timely and cost-effective manner. In addition, there are impediments to free movement of goods because

of multiple checkpoints along roads. Maintaining peace and security in the SADA Zone is a critical factor for the private sector.

High cost of doing business: clearly challenging climatic conditions, the lack of infrastructure, and an unconducive investment climate can contribute to high costs of doing business. There are some specific factors that contribute to the high cost of doing business in the SADA Zone. In general, there is limited access to inputs, and a high cost to obtain inputs. Furthermore, access to finance is often not an option for many rural dwellers. This includes a scarcity of skilled labour and managerial capability. Also, there is a lack of rules, regulations and enforcement mechanisms for “doing business” in a competitive manner nationally and internationally.

Low Agricultural Productivity: is caused by many factors, including those related to natural factors (e.g., climate, soils, water resources, and land suitability), and remoteness from markets and lack of infrastructure; and the unconducive investment climate and high cost of doing business. In addition, there are problems related to poor farm management practices, diseases and pests, limited access to improved planting materials, seeds and livestock breeds, low adoption of existing technologies due to poor market incentives and inaccessibility to relevant inputs, limited appropriate technologies for processing, transporting, handling and storing crop, fish and livestock products, limited knowledge of post-harvest management, and arduous traditional processing techniques. The real question is whether farmers in the SADA Zone can achieve levels of productivity that would make them competitive in domestic and foreign markets.

3.0 INTERNATIONAL EXPERIENCES IN SAVANNAH ECOLOGICAL ZONES

Globally, the semi-arid Savannah Ecological Zone spans across much of Sub-Saharan Africa, and also through parts of South America, India, South East Asia, and Australia. The Savannah Ecological Zone that passes through Africa is called the Guinea Savannah Zone. According to the World Bank (2009) report: *Awakening Africa's Sleeping Giant: Prospects for Commercial Agriculture in the Guinea Savannah Zone and Beyond*, the African Guinea Savannah Zone is one of the largest underused agricultural land reserves in the world.

In terms of agro-climatic features, the land is very similar to the Cerrado region of Brazil and the Northeast region of Thailand, with medium-to-high agricultural potential, but also significant constraints in the form of low and variable rainfall, and soils with low natural fertility. Also, like the SADA Zone, these regions in Brazil and Thailand were characterized by remoteness and lack of productive and social infrastructure, and high poverty rates.

Thus, despite the long list of constraints facing the SADA Zone, some developing countries with similar constraints (notably Brazil, Thailand, Nigeria, Zambia and Mozambique) have experienced successful agriculture-led economic transformations of lagging Guinea Savannah areas. These successful international experiences required: a) large-scale investments in productive and social infrastructure, b) strengthening of existing institutions and creation of new institutions, and c) adjusting policies and incentives in a manner that promotes commercial agriculture and larger farms, while also supporting smaller farms that are more focused on achieving food security (World Bank, 2009).

International experience with agriculture-led transformation in Guinea Savannah Zones also points to the need for both public and private sector investments, and that efforts to improve the business climate are especially important to commercial agriculture, as they are needed to facilitate the entry of private seed and agro-processing companies, among others. By definition, successful commercial agriculture

depends on well-functioning markets. The greatest challenge for commercial agriculture is to put in place the institutions and policies that make markets more efficient and less risky (World Bank, 2009, pp.18).

International experience with agriculture-led economic transformation in Savannah Zones indicates that land policy, more than any other factors, determine the pattern and distributional impacts of agricultural growth. Providing secure and transferable land rights is critical to protecting the interests of local populations while permitting entrepreneurial farmers to acquire unused land in regions of low population density, allowing land to change hands over time to those who can use it most productively, and providing incentives to invest in increasing land productivity (World Bank, 2009, pp.16).

BOX 7: AWAKENING THE SLEEPING AFRICAN GIANT

The World Bank (2009) report *Awakening Africa's Sleeping Giant: Prospects for Commercial Agriculture in the Guinea Savannah Zone and Beyond* has been cited in SADA's Agricultural Masterplan as a "guide to the possible" for the SADA Zone. The report focuses on the agricultural potential of Africa's Guinea Savannah zone. In terms of its agro-climatic features, the land is similar to that found in the Cerrado region of Brazil and in the Northeast Region of Thailand, with medium-to-high agricultural potential but also significant constraints in the form of infertile soils and variable rainfall. Based on a careful examination of the factors that contributed to the successes achieved in Brazil and Thailand, as well as comparative analysis of evidence obtained from detailed case studies of three African countries—Mozambique, Nigeria, and Zambia—the report argues that opportunities abound for farmers in Africa. This provides reasons for optimism regarding the future prospects for agriculture as a major source of inclusive growth in many parts of Africa. At the same time, the report concludes that success will not be achieved easily. Making African agriculture competitive will depend on getting policies right, strengthening institutions, and increasing and improving investments in the sector.

http://siteresources.worldbank.org/INTARD/Resources/sleeping_giant.pdf

Successful transformations of Savannah Zones in other countries is what ultimately led the Government of Ghana to establish SADA as a special authority to address the developmental challenges of Ghana's NSEZ. In the African context, it has been noted that agriculture is generally not competitive in global markets, but generally are competitive in domestic markets, so that there has been a focus on domestic markets (i.e., import substitution) and exports to countries with shared borders, and other African countries. International experience also points to potential conflicts over land access and use. In fact, land tenure issues in the context of agriculture-led economic transformation pose enormous challenges that need to be addressed. Many of the recommendations presented in this summary report are drawn from lessons learned in other countries.

One of the key assumptions behind the strong cooperation between SADA and Brazil (through Queiroz Galvão) is the strong, long-term collaboration that exists between Brazil and Ghana in the field of agriculture. Particularly, Brazil has overseen, over the past 30 years, a major agriculture-led economic transformation of its own Savannah Ecological Zone, the Cerrado. Brazil's Cerrado has “transformed from a sleepy backwater into a highly productive, globally competitive agricultural exporter”. Hence, Brazil has much to offer to Ghana in terms of knowledge and technology on how to transform a Savannah environment (with the typical natural challenges specific to it, such as erratic rainfall, soil constraints, etc.) into a highly productive agricultural frontier. What is also relevant is that various technologies and techniques have been developed, tested and proven successful in the Brazilian Savannah in the Ghanaian Savannah. Most of the techniques and technologies contained under the Good Agriculture Practices extensively used in the Brazilian Savannah and proposed for the SADA Zone are also part of the climate-smart agriculture approach.

BOX8: GOOD AGRICULTURAL PRACTICES AND CLIMATE-SMART AGRICULTURE

Typical good agricultural practices (and climate-smart agriculture options) include sustainable land and water management techniques such as conservation agriculture (minimum soil disturbance, permanent organic soil cover, crop rotation), contour farming, direct seeding, integrated pest management, water harvesting, among many others. By generally improving the use of resources (water, land) for agricultural purposes (improving soil water holding capacity, controlling erosion, improving soil structure with organic matter, boosting soil nutrients, etc.), these techniques not only boost farmers capacity for climate change resilience and adaptation, but also strongly contribute to increasing financial sustainability and profitability of agriculture. (Resources and Masterplan for the Transformation of Agriculture in the SADA Zone)

The Agricultural Master Plan focuses attention on identifying high-potential areas and value chains to drive agricultural development via production and processing. SADA has adopted a “zonal approach” to development of the SADA Zone, whereby it is trying to use objective evidence-based analyses to identify areas of high-potential and competitive advantage for select value chains. This zonal approach is usually referred to as a “cluster approach” or “growth pole approach”, “agro-industrial zone approach” and more recently as an “agro-pole approach”. The African Development Bank (AfDB) has adopted the zonal approach for several countries and is using the term “agro-pole approach”. Increasingly the AfDB and World Bank/IFC have been advocating an agro-pole approach for agriculture-led economic transformation in the Africa region. The SADA Agricultural Masterplan identifies 6 Agribusiness Development Zones, each of which has some specifically targeted agricultural value chains and links to urban centres and major transport networks.

BOX 9: AGRICULTURAL CLUSTERS AND AGROPOLES

According to the United Nations Industrial Development Organization (UNIDO, 2016), developing agro-industrial clusters (also referred to as agricultural clusters, agro-poles, agro-industrial parks, and special economic zones) in Africa is a strategic approach to inclusive and sustainable development. To deliver effectively and efficiently in the global interest of inclusive employment and sustainable development requires significant coordination of efforts, resources and knowledge; and leveraging the core competences of key stakeholders namely: a) government (not just the Ministry of Agriculture), b) development partners, and c) private sector entrepreneurs and businesses (local and foreign).

An agro-industrial cluster is a concentration of producers, agro-industries, traders and other private and public actors engaged in the same industry and who are addressing common challenges and pursuing common opportunities. The concept is based on the relationships between raw material suppliers and end users and the differences in design are defined by the degree of explicit coordination and power asymmetry.

A key objective is to stimulate private sector investments to drive a market-led agricultural transformation by: a) shifting agriculture from government controlled to private sector led, b) transforming the agricultural financial landscape, c) channelling investments into infrastructure and services, and d) strengthening the policy and investment climate. This should help link farmers to markets for both inputs and products; thereby guaranteeing access to lower cost inputs and higher priced products. It is possible to increase food production and processing, decrease post-harvest losses, create more employment and reduce out-migration.

Excerpts from a presentation made at the AfDB-sponsored conference on “The Role of Agropoles and Agro-Processing Zones in Feeding and Industrializing Africa” held March 22-23, 2016. Presentation by Chuma Ezedinma, UNIDO.

http://www.afdb.org/fileadmin/uploads/afdb/Documents/Generic-Documents/Agropoles_Agenda_16-03-2016_V_Eng.pdf

4.0 MAIN FINDINGS AND PROPOSED ZONES FROM SADA'S AGRICULTURAL MASTER PLAN

SADA's Agricultural Masterplan has benefited from decades of acquired knowledge on the natural resources, proposed infrastructure, contained in various surveys, feasibility studies, policy concept notes and documents developed over the last decades. The works of the masterplan were organized under 4 main thematic pillars.

Pillar 1 – Inventory of natural resources for agricultural development and modernization included gathering and review of existing information on soil conditions, water resources, climate, geology and other natural characteristics of the SADA Zone. Information was organized both in spatial and database modes and is available for dissemination among stakeholders and private investors.

Pillar 2 – Land suitability assessment investigated the suitability of 25 crops under rain-fed and irrigated conditions, livestock, forestry and aquaculture, based on the FAO-IIASA Agro-ecological Zones (AEZ) approach.

Pillar 3 – Proposed infrastructure development consolidated different infrastructure proposals developed in different feasibility assessments (dams, irrigation schemes, others) into an integrated set of potential projects.

Pillar 4 – Policies, Technologies, Value Chains and Spatial Framework provides options and a proposed course of action based on the identification of agribusiness development zones delineated along unique and complementary value chain potentials.

Some of the specific findings and proposals from SADA's Agricultural Masterplan are presented ahead.

4.1. OVERVIEW OF MAIN FINDINGS AND GAME-CHANGING PROJECTS

Among the main findings of the SADA Agricultural Masterplan, it was concluded that in the SADA Zone there are:

- ⊙ More than 8 million hectares (ha) of highly suitable land which can be used for environmentally and socially sustainable commercial agricultural, livestock, forestry and aquaculture production under rain-fed or irrigated conditions;
- ⊙ 23 large and medium sized dam sites which can be developed for hydropower, irrigation, flood control, aquaculture, and/or multipurpose uses;
- ⊙ 5 proposed large-scale irrigation schemes (> 4,000 ha) with potential gross irrigable land ranging from 209,000 ha to 547,000 ha;
- ⊙ Over 104 small dam sites across 95 small catchments which can harness over 104,000 ha of irrigation in small and medium-sized schemes (400 ha > 4,000 ha);
- ⊙ Over 40 billion m³ of renewable water that can be tapped for irrigation and human/animal consumption;
- ⊙ Availability of large quantities of lime deposits that can be used to improve soil quality.

Based on findings from the SADA Agricultural Masterplan, there are several potential “game-changing” investments/projects. It was found that with public investment of about USD 2 billion into infrastructure for irrigation, power, and roads over the next 20 years could leverage and achieve:

- ⊙ 200,000 ha under irrigation in large, medium and small-sized irrigation schemes (with 50% funded by public investments and 50% funded by the private sector);

- ⊙ Attract between USD 1.9 to USD 2.3 billion of private investment into farming, downstream processing, and additional irrigation infrastructure;
- ⊙ Create from 400,000 to 450,000 permanent jobs along targeted value chains;
- ⊙ Generate additional annual value chain revenues of about USD 1.2 billion in the rice, poultry, vegetable oils, sugar, fruits and vegetables (including exotic crops such as chilli, etc.).

SADA's Agricultural Masterplan emphasizes that transformational investments in infrastructure (e.g., irrigation, power, transport, ICT), changes in policies that improve access to and efficient use of inputs, and appropriate environmentally sustainable agricultural technologies and practices are key to:

- ⊙ Creating an enabling environment to attract substantial private investment into the zone;
- ⊙ Increasing the attractiveness, sustainability and profitability of agricultural production to smallholder, medium and large farmers; and
- ⊙ Improving the livelihoods, creating jobs, economic and social development, increasing food security and incrementing Ghana's economic clout through import substitution and export revenue creation.

The proposed policy framework is structured upon 3 strategic pillars, 9 framework programs and 49 policy projects. The 3 strategic pillars are: 1) Establishment and/or improvement of the key hard (i.e., infrastructure), soft (i.e., policies, institutions) structures and information systems, 2) Improving and upgrading farm level production in a sustainable manner, and 3) Launching successful downstream processing and agriculture-based industrialization (i.e., agribusiness value chains).

The policy projects are proposed to deal with specific constraints and targets, such as land tenure, financing for large, medium and small farmers, financing for public infrastructure, irrigation infrastructure, improvement of research and extension services, transformation of

subsistence to commercial agriculture among smallholders, sustainability, seed and agro-chemicals policy and access improvements, attraction of private investment, climate-risk and multi-hazard assessment capacity creation, among others.

Annex 3 contains a detailed table explaining the strategic pillars, framework programs and policy projects proposed in SADA's Agricultural Masterplan.

It needs to be emphasized that all of the proposals in SADA's Agricultural Masterplan take into account the critical issue of how different projects might impact the overall water balance in the SADA Zone and downstream areas in the rest of Ghana.

Irrigating 200,000 ha of land will likely require an estimated annual water abstraction rate of 3 billion m³, corresponding to 7% of all annual runoff in the Volta Basin and 13% of the Volta runoff generated within Ghana), believed to be sustainable abstraction rates within the current and future scenarios of water availability and in line with much of available international experience.

A key concern regards potential power generation losses at the downstream Akosombo and Kpong dams. While increased upstream consumptive uses may impact power generation, it is also true that potential losses may well be offset by additional opportunities opened by irrigation (power generation from crops biomass - sugar cane, rice husks, etc.) as well as the huge potential for renewable energy (mainly solar) available in the SADA Zone.

Groundwater as an alternative source, increasingly efficient irrigation methods, climate-smart agriculture and good agricultural practices should also contribute to the sustainability of irrigation water use.

Historical and up-to-date hydrological studies, in addition to assessments on the impacts of climate change on river run-off and analyses were used to address this sensitive subject. Annex 4 contains a hydrological map and details about water use scenarios.

4.2. PROPOSED AGRICULTURAL VALUE CHAINS

A value chain approach views all production stages (farm production, up and downstream services and processing) as one single system. Strong value chains can create significant returns for societies and market players alike. The SADA Zone's strong suitability for agriculture provides the foundation for the creation of environmentally and economically sustainable value chains.

SADA's Agricultural Masterplan identified several high-potential agriculture value chains based on the following criteria:

- ⊙ The natural suitability of the SADA Zone to grow the specific crops required within specific value chains;
- ⊙ Their potentials to socially and economically transform the SADA Zone;
- ⊙ Their labour-intensiveness and job creation potential;
- ⊙ Their potential contribution to Ghana's strategic development goals;
- ⊙ Their contribution to food security; and
- ⊙ Their contribution to import substitution and export revenue creation.

The agriculture value chains that can potentially bring broad-based and long-lasting benefits to the SADA Zone include:

- ⊙ Grains, cereals and oilseeds (rice, maize, soybean, sorghum, millet, groundnuts, cowpea, etc.) – for direct consumption and/or for vegetable oils, animal feed, fibres, etc.;
- ⊙ Cotton and textiles
- ⊙ Poultry;
- ⊙ Meat and dairy livestock;
- ⊙ Cassava and tubers (yams, sweet potato) – for flour, starch and other by-products;

- ⊙ Sugar;
- ⊙ Fruits (citrus, mango, cashew, pineapple, plantain/banana) - for fresh-cut, frozen fruits, juices and concentrates;
- ⊙ Fresh and processed vegetables – for domestic markets and neighbouring countries, and airborne transport to Europe and other markets;
- ⊙ Aquaculture (pond and reservoir-based).

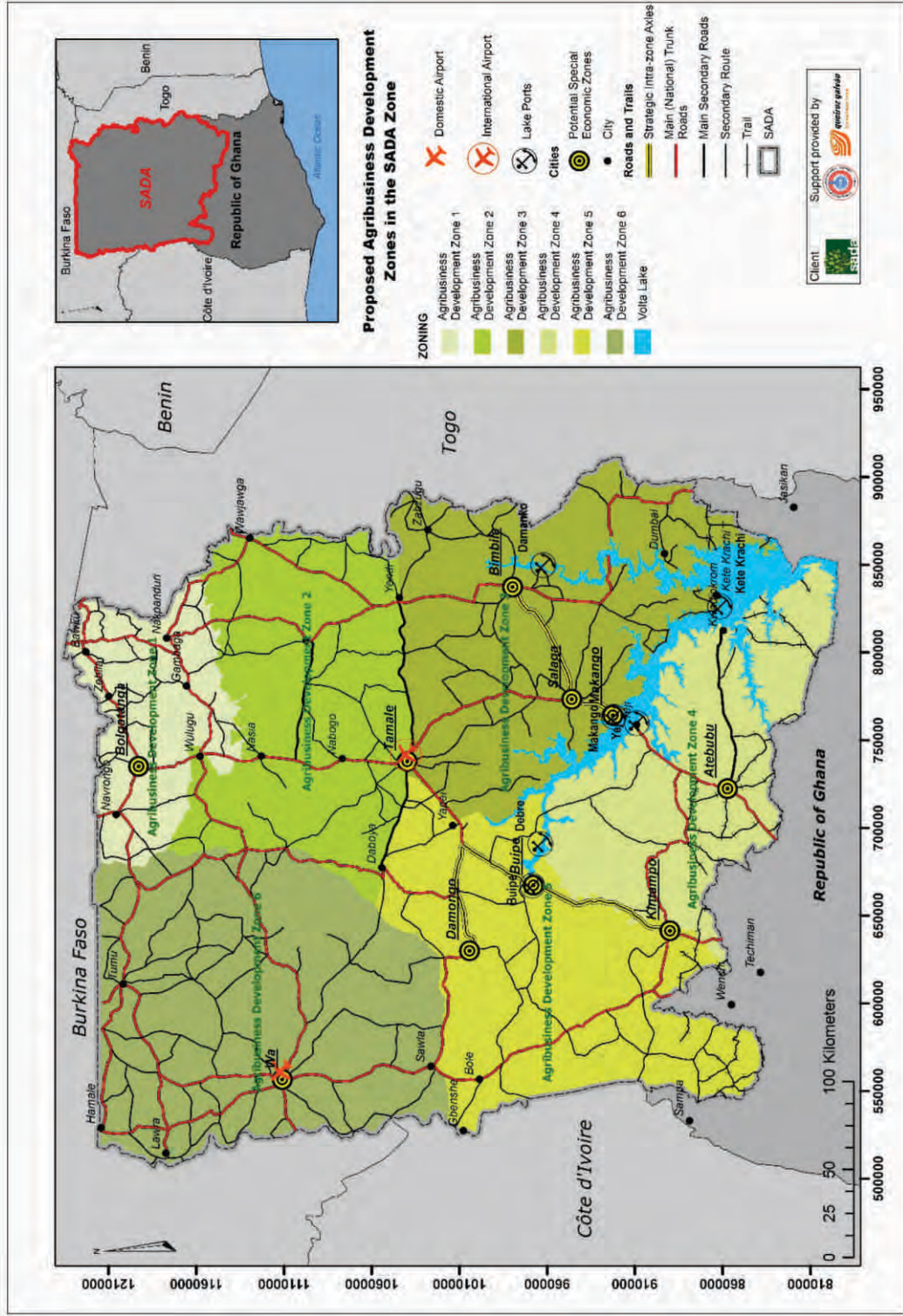
4.3. SADA'S PROPOSED 6 AGRIBUSINESS DEVELOPMENT ZONES FROM AGRICULTURAL MASTERPLAN

Analysis of the agricultural resources of the SADA Zone indicates that different parts of the SADA Zone have different characteristics, e.g. share of resources, dynamic of urban and rural populations, availability of agricultural land versus environmentally-protected areas, land suitability, suitable for different transformational paths. Thus there is a need for a spatially differentiated framework for agriculture-led economic transformation.

According to SADA's Agricultural Masterplan, 6 Agribusiness Development Zones were identified that generate specific agribusiness clusters (for specific agricultural value chains). The Agribusiness Development Zones are areas that share common infrastructure (notably irrigation, power, transport, and information and communication technology, ICT) and urban centres. Within each Agribusiness Development Zone there might be one or several value chains (or clusters) that share the infrastructure and urban-based services.

Priority infrastructure projects were also identified as potential catalysts of private investment and agribusiness value chains in each of the zones and clusters. The zones are shown in the map in Figure 4, and their main features are summarized in Table 1.

Figure 3: Agribusiness Development Zones As Proposed In Sada Agricultural Masterplan



Source: Resources and Masterplan for the Transformation of Agriculture in the SADA Zone

Table 1: SADA's Proposed 6 Agribusiness Development Zones: Main Features

AGRIBUSINESS DEVELOPMENT ZONE	KEY URBAN CENTRES	POTENTIAL VALUE CHAINS	PRIORITY PUBLIC INFRASTRUCTURE PROJECTS	POTENTIAL PRIVATE INVESTMENT PROJECTS
Zone 1	Bolgatanga, Navrongo, Bawku, Zebila, Gambaga, Nakpanduri, Bongo	Livestock, rice, fruits (cashew, pineapple, mango), vegetables, grains, cereals and oil seeds	Pwalugu Multi-purpose Dam, Tamne Irrigation Scheme, second dam on the Tono river	Rice mill, rice out-grower scheme, vegetable oil mill, vegetables and fruits packing house and processing, beef slaughterhouse, grains, cereals and oilseeds out-grower scheme
Zone 2	Tamale, Nasia, Nabogo, Savelugu, Wulugu, Wale, Gushiago, Daboya	Rice, grains, cereals and oil seeds, poultry, sugar and livestock	Nasia-Nabogo Irrigation Scheme, Pwalugu Irrigation Scheme, Fumbisi Valley Irrigation Scheme	Rice mill, Rice anchor farms and out-grower scheme, soybean-maize anchor farms and out-grower schemes, poultry farms and out-grower schemes, sugar estate, out-growers scheme and mill, vegetable oil and feed mill
Zone 3	Yendi, Bimbila, Salaga, Makango, Kete Krachi, Dambai, Nkwanta	Rice, grains, cereals and oil seeds, sugar, perennial fruit crops, aquaculture, cotton, cassava, livestock	Juale Multi-purpose dam, the Daka River Valley Irrigation Scheme and a grains harbour terminal at Makango	Rice mill, rice anchor farms and out-grower schemes, soybean-maize-cotton anchor farms and out-grower schemes, fruit trees out-grower schemes, cotton processing and ginnery, cassava processing facility, aquaculture out-grower scheme, fruit packaging house and juice factory
Zone 4	Atebubu, Amantin, Sawaba, Yeji	Fruits under irrigation (mango, banana, pineapple, citrus, etc.), cassava, yams, rice, grains, cereals and oil seeds, planted forests, sugar	Lake harbour at Yeji, improvement of road connections, pumped irrigation across the lake	Fruit trees seedlings production, aquaculture out-grower scheme, fruit trees out-grower scheme, vegetables out-grower scheme, cassava processing, vegetables packing house, Yeji port and barges, forest farms and bio-energy plants
Zone 5	Buipe, Kintampo, Damongo, Bole	Grains, cereals and oil seeds, poultry, juices and fresh-cut fruits from perennial fruit crops (cashew, mango, citrus), pineapple, non-traditional crops in the Zone (coffee, cocoa, oil palm), sugar	Bui Irrigation Scheme, Jambito and Ntereso hydropower stations, Major port and Industrial Estate in Buipe	Maize-soybean anchor farms and out-grower schemes, Fruit trees seedlings production, fruit out-grower schemes, fruit packing house and juice production facility, sugar estate, out-grower schemes and mill
Zone 6	Lawra, Wa, Sawla, Tumu	Grains, cereals and oil seeds, livestock, cotton, cashew	Koulibi Hydropower dam, Kanyambia, Sissili and Kulpawn multi-purpose dams	Cotton processing and ginnery, cotton out-grower scheme, cashew nuts out-grower scheme and processing facility, maize-soybeans-cotton anchor farms, and out-grower scheme, shea butter out-grower

Note: Grains, cereals and oilseeds include mainly maize, soybean, groundnuts, pearl millet, sorghum, cowpea and cotton. Rice is highlighted separately as well as cotton in special cases.

Source: This table was prepared based on the 6 Agribusiness Development Zones presented in the SADA Agricultural Master Plan.

5.0 . AGRICULTURAL INVESTMENT WORKSHOP (AIW) ROAD MAP RECOMMENDATIONS

Recognizing the need for greater coordination of existing interventions in the SADA Zone, and the need to also identify investment, institutional, and policy gaps to attract the private sector, SADA organized an Agriculture Investment Workshop (AIW) with support from The World Bank, United States Agency for International Development (USAID), Ghana Commercial Agriculture Project (GCAP), International Food and Policy Research Institute (IFPRI), International Water Management Institute (IWMI), Africa Green Revolution Alliance (AGRA), and the African Development Bank (AfDB) helped SADA organize and facilitate the SADA Zone AIW.

The main objective of the SADA Zone AIW, held June 21-23, 2016 in Accra, was to provide SADA and the Ministry of Agriculture (MOFA) a venue to convene Government Ministries and agencies, development partners (DPs), and research institutions, and other key stakeholders to identify and discuss major constraints and solutions for attracting investment to the agricultural sector in the SADA zone that can transform the sector into a driver of growth and job creation. The key questions addressed were: a) What is needed to make the SADA Zone attractive for private sector investments, b) How can Ghana achieve *inclusive agricultural-led economic transformation of the SADA Zone*, and c) What are the “low-lying” short-term solutions and actions to achieve long-term objectives? The key output of the workshop was a “Road Map” of recommendations for agricultural-led economic transformation of the SADA Zone. These recommendations are presented below.

BOX 10: ROAD MAP TO THE ROAD MAP

The 3 key questions addressed at the AIW are actually linked one-to-another: a) What is needed to make the SADA Zone attractive for private sector investments, b) How can Ghana achieve *inclusive agricultural-led economic transformation of the SADA Zone*, and c) What are the “low-lying” short-term solutions and actions to achieve long-term objectives? That is, it is important to make the SADA Zone attractive to the private sector and ensure that this is done in an inclusive manner, and make sure that short-term policy and institutional changes, and investments are consistent with the medium- to SADA's longer-term vision. Thus, it is important for readers to read the entire section to understand that “the whole is greater than the sum of the parts”. The overall approach and the strategic investments tend to focus attention on the medium- to longer term. With respect to the “short-term” solutions, these are mostly found in the sub-sections addressing the enabling environment, access to seeds and to land, risk management, and the future role of SADA. These sub-sections tend to be policy and institutional factors that can, in theory, be addressed immediately; if there is the political will and stakeholder consensus to do so.

5.1. APPROACH

SADA has adopted a spatially differentiated but inclusive approach to agriculture-led economic transformation of the SADA Zone. There is a need to commercialize small farmers using different models and also integrate strategies for improving food (and water) security for all residents in the SADA Zone. One of the keys to unlocking the agricultural and employment potential of the SADA Zone is to improve land/water management to allow multi-cropping per year, rather than being constrained to one rain-fed crop per year.

Agro-Pole Approach: The SADA Zone is a large area and it requires investments that are strategically located, because there are not enough resources to spread throughout the region. There is a need to identify areas suitable for particular value chains (i.e., “high-potential areas” for given crops, livestock). This integration of spatial planning and targeting of competitive value chains (as opposed to targeting of individual raw commodities) requires spatial planning and multi-sectoral coordination by Government, and increased coordination among programs, projects, and enterprises. SADA's development strategy is guided by the mapping of growth poles and agricultural value chains. As such, SADA's Agricultural Masterplan identified 6 Agribusiness Development Zones with different agricultural value chains that are clustered around different urban centres and major road networks.

Inclusive Approach: SADA recognizes the need for a strategy that includes all types of farmers and agri-businesses; large, medium, small and which help reduce both rural and urban poverty in the SADA Zone; and in the rest of Ghana. There is a need to commercialize small farmers using different models (e.g., contract farming, out growers, nucleus farms, farmer cooperatives). These different models for small farmers need to be evaluated to identify the most efficient and equitable ways to include small farmers. Despite ongoing attention to small farmers, it is important to recognize the need for medium and large scale commercial farming operations that can anchor and drive agricultural development around them, including links to small farms and small businesses (i.e., one of the concepts behind nucleus farms and some out-grower and contract farming arrangements). Likewise, it is important to recognize and facilitate the potential for farm productivity growth-led linkages to agro-processing and other sectors, and to devote special attention to education and training, and to creating jobs and business opportunities for youth and women along value chains. For an inclusive agro-pole approach it is important to recognize the appropriate roles for public and private sectors, and for possible Public-Private Partnerships (PPPs) for the provision of infrastructure and for service delivery.

Multiple Crops per Year: A major constraint facing the SADA Zone is that it is semi-arid with only a single uncertain rainy season (with risk of droughts and/or floods, and high rates of evapotranspiration) that might or might not provide sufficient water for crops and livestock and harvests. A single uncertain harvest per year results in major socio-economic challenges related to seasonality of cash flows and limits to annual incomes that, in turn, provide incentives for seasonal and/or permanent out-migration. There is a need in the SADA Zone to promote improved land/water management systems to facilitate multiple cropping cycles per year to increase incomes/jobs, and lessen out-migration. Integrated crop-livestock farming systems with improved land/soil management (that includes providing supplemental water through irrigation) should be promoted and supported.

BOX 11: POTENTIAL FOR FLOOD RECEPTION AGRICULTURE

Research at the International Water Management Institute (IWMI) Significant potential exists to use flood recession agriculture (FRA) to increase food production and rural incomes in northern Ghana. Currently about 60% of households in the floodplains are practicing low-input low-output FRA. Nearly 8,000 km² (about 10% total area of Northern and Upper East regions) can potentially be placed under improved FRA, with an estimated 20,000 farm households benefitting. Production of staple food crops (maize, rice, cowpea, leafy vegetables) and commercially grown spices (onion, tomato and pepper) can be expanded under FRA. Policy and institutional measures are needed to promote improved FRA. Investment in development of flood-compatible crop varieties, particularly rice in order to expand its production under FRA. Improved access to irrigation equipment and kits for small-scale farmers as some FRA crops require supplementary irrigation, but presently only about 10% FRA farmers own irrigation equipment. There is a need for improved access to other inputs (fertilizers and pesticides) and markets to make optimum use of soil moisture for intensification and increased productivity. Also there is a need to invest in hydrological, weather and farm management data collection; the same type of data that is crucial for risk management.

From presentation by T.O Williams and B.B Bedru from IWMI at the GSSP Policy Dialogue, October 2016.

5.2. STRATEGIC INVESTMENTS

To “polish” the SADA Zone diamond-in-the-rough and “open the tap” to the SADA Zone economic reservoir, there is a need for increased public sector investments for agriculture in the SADA Zone. The Government of Ghana might also consider an increased allocation of Annual Budget Funding Amount (ABFA) - funds from natural gas and oil field revenues - to the SADA Zone for infrastructure.

It is *recommended to prioritize and strategically locate investments*. Following the agro-pole approach it is important to prioritize and strategically locate investments in: a) roads; b) power; c) irrigation; d) human capital; and e) GIS, ICT and information services in areas with high potential for commercial agriculture.

There is a need for targeted investments in *feeder roads and farm tracks* for better market links. There is a need for strategic large-scale investments in *power generation and distribution* to increase quality/dependability of electricity supply for irrigation, agro-processing, and social infrastructure/service needs. There is a need for strategic investments in *small, medium and large irrigation* (e.g., small scale pumps, micro dams and other water catchment, public irrigation schemes). It is also important to promote adoption of small-scale farm equipment (e.g., mini rice harvesters and threshers, locally fabricated corn shellers). Such equipment is easy to handle and repair, portable and affordable; compared to the very expensive larger scale combine harvesters which farmers can not buy or maintain.

Also there are needs for investments in *human capital development* for commercial agriculture (business literacy, agricultural and agri-business education, technicians to operate and maintain machinery and equipment), and focusing on youth. There is also need for investments in geographic information systems (*GIS*), information and communication technology (*ICT*) and *information systems*; and improving databases on farmers, agricultural production and processing, and other linked activities.

5.3. ENABLING ENVIRONMENT AND FINANCING

Investors seek a supportive enabling environment and opportunities that allow them to be cost competitive in multiple markets domestically and internationally. Preferential access to financing is often sought by investors in the agricultural sector. The enabling environment has national, regional, and local dimensions.

SADA can lobby for national policies, but has more control over regional and local policies.

At the workshop, it was discussed how to make the enabling environment more conducive by both: a) reducing the costs of doing business, and b) increase the incentives for doing business. Maintaining peace and security is a cross-cutting issue that is critical for a conducive enabling environment.

Reduce the costs of doing business. There are impediments to free and efficient trade flows in the SADA Zone, including numerous road check-points and other barriers, and cumbersome regulatory processes. So, *it is recommended to: (i) reduce the number of road barriers along trade routes in the SADA Zone, and (ii) streamline regulatory processes that impede business development by improving transparency and use of time-bound processes.*

There should be ongoing communication between the private sector and public sector about the impediments to free trade and how to eliminate them, and how to reduce the costs of doing business. One problem is the lack of coordination between policies and enforcement. *It is recommended to establish a Public-Private Sector Working Group that meets monthly or more to address ongoing issues.*

Increase the incentives for doing business: Although Government talks about increasing support to the agricultural sector, there are new policies that tax agricultural inputs and machinery. *It is recommended that Government reconsider the new policy that taxes agricultural inputs and machinery, especially for the SADA Zone.*

Some countries that have adopted an “agro-pole approach” (e.g., Nigeria) have tried to provide incentives for development of strategic areas by *granting free-trade zone status* for agricultural production and especially processing. And/or they have *established industrial zones* with guaranteed access to power, water, transport, and ICT.

It is also possible for Government to create *differential tariffs for power to agriculture* for irrigation and processing, and/or to consider *trade import policies* that promote domestic agricultural production and processing.

SADA, together with MOFA, should also explore options to provide medium- and long term financing to the agricultural sector in SADA Zone, *consider new financial institution(s)*.

5.4. SECURE ACCESS TO LAND AND SUSTAINABLE LAND MANAGEMENT

Secure access to land is fundamental to an agriculture-led economic transformation of the SADA Zone, and it is critical that land use is managed in a sustainable manner to maintain and enhance soil fertility and productivity. However, there are many challenges and constraints to secure access to land and sustainable land management in Ghana as a whole, including the SADA Zone. In general, there are problems with land transactions in Ghana because of conflicting claims to use rights and ownership, and also because of a lack of contract enforcement. Thus, it is critical for the Government of Ghana and SADA to establish trusted mechanisms to lower costs/risks in land transactions. SADA needs to work closely with the Ministry of Lands and the National Land Commission.

SADA should consider different mechanisms for changing land use rights to encourage higher productivity; including land leasing and land transfer. For *land leases*, SADA should encourage communities to establish legally enforceable mechanisms such as Land Trusts to negotiate land leases with investors. For land transfer, SADA should establish mechanisms such as Land Banks to acquire land and transfer it to investors.

BOX12: SADA LAND TRUST

SADA is seeking to simplify land acquisition for commercial agriculture by: a) encouraging communities to establish legally binding Land Trusts which pool land and transactions regulated by Trustees, and b) establishing its own SADA Land Trust to encourage land ceding, and c) establish a Land Trust to encourage investment in land.

To help ensure secure access to land, it is important to also improve mechanisms for community participation in land transactions, and to improve contract enforcement mechanisms for land leases and transfers. Secure access to land is a necessary condition for sustainable land (and water) management.

There are several other ways to provide incentives for improved land/water management practices that, in turn, improve sustainable land (and soil fertility) management. These include micro-irrigation systems, crop rotations, integrated crop-livestock systems, agro-forestry, and increased use of organic fertilizer including compost. Many of these efforts are underway in Ghana, and they need to be scaled up and replicated throughout the SADA Zone.

5.5. ACCESS TO SEEDS AND OTHER INPUTS

Increased agricultural productivity is required in the SADA Zone for an agriculture-led economic transformation, and improved inputs are needed to increased agricultural productivity. One of the key inputs that can rapidly increase productivity and total production is use of improved seed varieties. That is, small farmers can make marginal changes to their existing farming practices and reap significant increases in harvests by using improved seeds (which usually also requires increased use of fertilizers and water and labor).

Despite the existence of a new Seed Bill (which seeks to reconcile the current Seed Law with the regional (ECOWAS) regulations on seeds), there are ongoing debates in Ghana about how to regulate the supply of all seeds, including improved seed varieties - via imports and/or

domestic production. Since much of the production and marketing of improved hybrid seeds is by international seed companies, there are domestic concerns about “seed security” that need to be addressed/mollified. The importation of high-yielding seeds can also be constrained by cumbersome rules and regulations and procedures to bring seeds into Ghana and to deliver them to targeted farmers. Cumbersome rules and regulations and procedures also constrain imports of farm machinery and agro-processing equipment.

Following international experience in other Savannah Zones, there is an urgent need to provide adequate support to public research institutions to implement long term strategies to supply farmers with superior seed varieties, and maintain pure lines. Also, there should be strong Government support for critical institutions in the seed sector (e.g., National Seed Council) to effectively provide coordination and regulation, to guarantee that foundation seeds are available to private firms, and to ensure integrity and pureness of seeds sold to farmers. Access to seeds could improve immediately by following through with the existing ECOWAS harmonization policy on seeds to benefit from a larger market for seeds and to encourage private investments.

High-yielding seeds usually require increased quantity and quality of fertilizers to maintain soil fertility. There is a need to encourage integrated soil fertility management through establishment of soil testing facilities, and the supply of both inorganic and organic fertilizers. There is a need for balance between use of inorganic and organic fertilizers and agro-chemicals, and to improve soil quality (fertility and water-holding capacity) through increased use of organic fertilizers and compost.

To ensure inclusive access to seeds and other inputs throughout the SADA Zone, it is important to support a system of approved agro-dealers in rural areas that can sell inputs (possibly on credit and linked with insurance), and also provide some extension services. This could all be linked via use of GIS, ICT and information services, and integrated with risk management systems.

As discussed previously, there is a problem in Ghana with respect to the adherence and enforcement of contracts. As such, there is a need to explore different contractual arrangements for supply of agricultural support services, including improved enforcement of linked input-credit-extension-marketing contracts (e.g., as used for contract farming, out-growers, and nucleus farms). There is also the need for continued public education on the importance of adhering to contracts.

5.6. RISK MANAGEMENT

Given Ghana's heavy reliance on rain-fed agriculture, drought causes the highest level of cumulative losses with the greatest impact on livelihoods, particularly in the SADA Zone. Droughts are most likely to affect sorghum, millet, maize, and groundnut production. In addition, flash flooding resulting from intensive rainfall occurs with relative frequency across Ghana, but only occasionally causes widespread destruction. Crops most affected include cassava, rice, yams, and groundnuts. There is also risk of bushfires in the SADA Zone. Existing capacity among stakeholders to manage such risks or cope in their aftermath is severely limited. There are a lot of concerns about the possible negative impacts of climate change, and all plans and project need to address existing and future changes in climate.

To improve risk management in the SADA Zone there is a need for more data/information about weather and climate and how they relate to yields and socio-economic outcomes. There is a need to invest in development of spatially-referenced databases that would facilitate public and private sector initiatives for improved multi-hazard risk management systems, including investments for: a) decentralized system of hydro-met stations, and b) water gauges for early warning for droughts and floods. By monitoring hydro-met and water gauge data, it will be possible to carry out analyses that check for evidence of climate change and its impacts.

BOX 13: AGRICULTURAL SECTOR RISK ASSESSMENT

Based on a risk prioritization carried out for the World Bank (2015) *Ghana Agricultural Sector Risk Assessment* report, actions in three interconnected risk management solutions areas are recommended: 1) water management, 2) pest and disease management, and 3) agricultural extension and innovation systems. The assessment identified and prioritized appropriate risk management interventions in these areas to improve stability, reduce vulnerability, and increase the resilience of agricultural systems.

With improved data/information, it will be possible to *improve agricultural risk management and adaptation to climate change* to enhance food security in the SADA Zone. This would include improved coordination of early warning and rapid response systems, and links to social protection systems using GIS and ICT. Such data/information is important for developing site-specific technologies and farming practices for climate-smart agricultural production and processing.

It is important to emphasize that improved land/water management, including irrigation and flood management, and holistic farming systems approaches are the best instruments for agricultural risk management (including climate change adaptation) in the SADA Zone.

Finally, with improved data/information on hazards and risks, it is possible to consider developing different insurance options for farmers and communities that include risk sharing and transfer mechanisms that can facilitate increased financing for agricultural production and processing (short/medium/long term financing for small/medium/large scale farms and enterprises).

5.7. FUTURE ROLE OF SADA

SADA was established in 2010, and re-launched in 2014. There are a lot of expectations from the “new SADA” and its potential roles as a planner and coordinator, as an enabler, and as an implementer. SADA's strategic objectives are to:

- provide strategic vision and planning to

Government, consistent with the national plan, but one which will ensure accelerated, integrated and comprehensive development of the SADA Zone (Northern Savannah Ecological Zone), in consultation with stakeholders; b) to mobilize human, financial and other resources for the implementation of the accelerated development strategy, and c) to co-ordinate existing and future development and related policies affecting the SADA Zone with a view to ensuring coherence in policy-making and implementation.

Going forward, SADA' mandate is to be operationalized through the objectives outlined above.

The future role of SADA in achieving inclusive agriculture-led economic transformation of the NSEZ is anchored on the mandate as by Law provided and is being further elaborated in the Regulations to the Legislative Instrument awaiting parliamentary approval. Broad consultative structures are being established to support the implementation of the mandate.

SADA has clear planning and coordination mandates. Its roles as an enabler, matchmaker, implementer as well as in M&E and the capacity requirements to execute them effectively may need further clarification and investment in its capacity to deliver. Similarly, how the Authority relates with other Government agencies, development partners, private sector, and NGOs to ensure development effectiveness may also need clarifying and reinforcing.

In all cases, it is important to strengthen the role for SADA as a “one-stop shop clearinghouse” for potential investors in SADA Zone in order to catalyse investments into the zone.

6.0 .THE WAY FORWARD

To move forward with the findings of the SADA Regional and Agricultural Masterplans and the AIW Road Map recommendations, SADA will need to provide leadership for the following immediate steps: a) widely disseminate a synthesis of the Road Map report highlighting the key issues and proposed actions; b) together with the Ministry of Food and Agriculture (MoFA) organize a Task Force as requested by H.E The President to monitor implementation of the Road Map; c) initiate consultations with development partners for the purpose of obtaining the appropriate political support, technical assistance, and funding to formulate and implement a coordinated multi-sector programme of work and identify funding mechanisms to unlock the untapped agriculture and agribusiness potential of the NSEZ.

Agriculture-led economic transformation of the SADA Zone will require a regional, multi-sectoral approach and a detailed Agricultural Development Plan; that is supported by Government, development partners, and local research institutes, NGOs, and civil society; and of course, the private sector. The Agriculture-led Transformation Programme will draw from SADA's Regional and Agriculture Master Plans, and the Development Concept Strategic Plan.

A strong partnership between SADA and development partners, private sector and across government will be crucial to implement these plans. This will call for effective coordination through sectoral and multi-disciplinary coordination structures as well as structures to ensure high level government leadership. An Inter-Ministerial Committee to provide oversight and a Development Coordination Office will be needed to bring together high level expertise to drive implementation and facilitate coordination. A programme to transform agriculture and agribusiness needs to establish and build consensus on a plan of action, beginning with a medium term implementation framework. Such a framework will, among others, identify on-going interventions and devise steps to maximize their impact; identify projects in the pipeline in government and development partner plans and

prioritise them and identify new investments that are truly transformational.

Before proceeding on a detailed Agricultural Development Program in the SADA Zone, it is important to highlight the fact that there are, in fact, many existing projects being funded by Government, development partners, and NGOs in the SADA Zone many of the constraints highlighted in previous sections. Coordination of existing (and future) projects has been recognized as a major challenge. As such, USAID has supported SADA to establish the Northern Sector Agriculture Investment Coordinating Unit (NSAICU), which is located in MoFA's office in Tamale.

The NSAICU has developed a database with an inventory of projects and it organises periodic meetings of key stakeholders. See Annex 4 for an inventory of (major) agricultural projects in the SADA Zone. As can be observed, there already are quite a lot of projects funded by a range of development partners. The proposed Agricultural Development Plan should complement existing programs and projects in the SADA Zone, and focus new investments on gaps that need to be filled.

To move forward, it would be good for SADA, and the NSAICU to take the proposed strategic pillars, framework programs, and policy projects and map existing projects (and components of existing projects) to try and help other parts of Government, development partners, and the private sector identify the gaps that would need to be addressed in an Agricultural Development Plan. It will be necessary to strengthen the NSAICU to cover the entire SADA Zone. SADA's capacity to facilitate investments, including its on-going efforts to address secure land access and land-use issues and to act as one-stop shop for information will need strengthening.

ANNEX 1: DESCRIPTION OF AGRIBUSINESS DEVELOPMENT ZONES 1 TO 6 FROM AGRICULTURAL MASTERPLAN

Agribusiness Zone 1: is located in the upper eastern side of the SADA Zone, and composed of: (a) the Upper East Region portion, and (2) the hilly stretches found in the Northern Region, mostly across Gambaga (where there are lime deposits) and Nakpanduri. These areas have high population densities and/or steeper-than-usual slopes. These characteristics suggest that agricultural development within this zone should target smallholder agriculture as a priority.

Soils are good quality and suitable for most of the crops which have been surveyed under the masterplan (grains, oilseeds, fruits, etc.). Irrigation is key to sustainable agricultural projects in the area, since rainfall is very low and evapotranspiration very high. Potential for irrigation comes from the White (Red) Volta and from underground sources.

Potential value chains (clusters) to be promoted and developed include livestock (livestock density is relatively high in the region), rice, vegetables (sweet potato as the key one), grains, cereals and oilseeds – maize, soybeans, cotton, etc. These are very suitable for irrigation of groundnuts mostly within the Tamne basin and across the Bawku-Gambaga road. Some fruits could also be developed, such as cashew and pineapple. Key infrastructure projects to be implemented include the Pwalugu Multi-purpose Dam, a second dam on the Tono River and the Tamne Irrigation Scheme, while a special economic zone around Bolgatanga should be encouraged, driven by processing industries and perhaps warehousing services serving neighbouring countries.

Agribusiness Zone 2: is mostly located in the Northern Region of Ghana, though with small stretches within the Upper East Region, extending to the border with Togo in the East, the Mole National Park in the West, the Daboya-Tamale road and the Tamale-Yendi road in the South. It is proposed that large scale commercial agriculture can coexist with smallholder agriculture, since larger stretches of suitable land are available, considerable water resources for irrigation are found in the zone and population density is lower than in Agribusiness Development Zone 1. Irrigation is key to sustainable agricultural projects, since rainfall is very low and evapotranspiration is very high. Potential value chains (clusters) to be promoted and developed include rice (so much potential that a rice belt or bow can be coined), grains, cereals and oil seeds, poultry, vegetable oils and sugar cane. Key infrastructure projects to be implemented include the Nasia-Nabogo, the Pwalugu, and the Fumbisi Valley Irrigation Schemes. A special economic zone could be located in and/or around Tamale.

Agribusiness Zone 3: is located in the South Eastern portion of the Northern Region and includes the Volta Region districts in the SADA Zone. Its border in the North is the Yendi-Tamale road, in the East it borders with Togo, the Volta Lake in the South and the White Volta River in the West. Water resources are plentiful in the Zone, which is dominated by the valleys of the Oti, Daka, and Mawli Rivers.

In this zone land suitability favours rice mostly, and large scale commercial agriculture can also coexist with smallholder farming. Large tracts of good soils provide favourable conditions for a

wide range of crops, including perennial crops, fruits, sugar, grains, cereals and oilseeds, cotton, vegetables and tubers. Irrigation is essential, but sustainable rain-fed production is possible for some annual crops, since rainfall is higher in the zone. Potential value chains (clusters) to be promoted and developed include rice (a second rice belt can be envisaged across the Daka and Mawli valleys), grains, cereals and oil seeds, livestock, vegetable oils, sugar under irrigation, fruits, cassava and cotton. Aquaculture is also a promising option, since cage (Volta Lake) and pond (high clay soils present) aquaculture can be strongly encouraged across the zone. Key infrastructure projects include the Juale Multi-purpose dam, the Daka River Valley Irrigation Scheme and a grains harbour terminal at Makango. A special economic zone could be located in this zone.

Agribusiness Zone 4: is located mostly in the Brong Ahafo Region (though it contains stretches of the East Gonja District of the Northern Region), and is bordered in the South by the Ashanti and Brong Ahafo Regions, in the West by the Black Volta-Lower Volta drainage basins boundary, in the North and East by the Volta Lake.

The Zone has higher rainfall than the average of the SADA Zone and plenty of high quality soils which can support the formation of several value chains (clusters). Population density is also relatively low, which implies that large scale commercial agriculture could also coexist with smallholder farming. Previous irrigation potential mapping of the zone is not as abundant as for the others, though the dominance of the Volta Lake across the zone implies that pump irrigation can be, to a certain degree, feasibly exploited, just as much as cage and pond aquaculture.

Soils can be subdivided under two categories. Parts of Agribusiness Development Zone 4 could support a wide range of agricultural value chains. Fruit crops (plantain, banana, citrus, coconut, mango, cashew, pineapple) would be one set of value chains to be developed. Cassava and yams (to a certain degree heavily cultivated by smallholders currently) could also provide good economic results across the region. If there is irrigation, parts of the zone could become a secondary rice bowl. Forestry and crop-forestry-

livestock integration could be foreseen for the region. The Digya National Park can also be a source of major tourism development, harnessing both the forest as well as potential water transport and recreation along the Volta Lake. Yeji could also be developed into a smaller inland port and landing site.

Agribusiness Zone 5: includes some of the highest potential for agriculture in the SADA Zone. Water resources are abundant, suitable multi-purpose dam sites are plentiful, soils are of great quality and the Buie Port City can play a vital role in diversifying the region's economy.

The Zone incorporates the South Western portion of the Northern Region and districts of the Brong Ahafo region and its borders are the Ghana-Cote d'Ivoire international border in the West, the Brong Ahafo region in the South, the Black Volta-Lower Volta drainage basins border and the White Volta River in the East, the Tamale-Daboya road, the Mole National Park and stretches of the Damongo-Sawla road in the North. It is possible to consider two major agricultural clusters in this zone. A major cluster, with irrigated and rain-fed farming in the northern part of the zone across Yapei-Damongo-Bole axis.

This cluster could focus on grains, cereals and oil seeds, laying foundations for poultry and vegetable oil value chains (cluster). A major cluster in the southern part of this zone could be around the Bui Irrigation Scheme, where higher added value crops can be promoted, including fruits (e.g., citrus, coconut, mango and cashew), cocoa, oil palm, pineapple, and even coffee, preferably in the Tain and Banda districts, can be tried in the area. Key infrastructure projects to be promoted include the Bui Irrigation Scheme, Jambito and Ntereso hydropower projects (potentially Lanka), a major lake port and industrial estate in Buie, a number of small and medium-sized dams and irrigation schemes in the Sorri River catchment (around Damongo).

Agribusiness Zone 6: is bordered in the North and West by the Ghana-Burkina Faso international border, in the South by the Damongo-Sawla road, in the East by the Mole National Park (the Park is entirely within this zone) and the Upper East Region. It is one of the largest zones in terms of

landmass and has some of the largest water resources, including the Black Volta, Kulpawn and Sissili Rivers. Agricultural potential in this zone is huge, but it also includes areas of national parks and forest reserves, which are no-go zones for agriculture (but tremendous opportunities for tourism). This area also has suitable land for shea nut production and already has a large percentage of shea trees growing in the wild as well as a fledging shea plantation.

Large tracts of suitable land are available across the Wa-Sawla road axis, which appear to be in a good position to not endanger any environmental issues. Across this axis, several types of crops (and value chains - clusters) can be developed, including grains, cereals and oilseeds, sugar under irrigation, cashew and other fruits, cotton, among others.

The Black Volta is a major asset to provide water for pumped irrigation across the Zone. The nature of the zone (higher elevations with streams and rivers that do not generally flood the plains like in Agribusiness Development Zones 2 and 3), presents many opportunities for small and medium sized dams, either in the South of the Zone (Gbalon watershed, around Sawla, with 5 potential small dam sites) or in the North (along the Hamale-Lawra-Wa axis, with over 13 small dam sites, including on the Kamba River).

Major infrastructure projects across the zone include the Koulbi (Noumbiel) hydropower dam (a bi-national development with Burkina Faso), tens of small and medium sized dams, the Kanyambia dam (around Tumu), which could provide for hydropower and irrigation development, in addition to the Sissili and Kulpawn dams (which would mostly benefit irrigable soils outside of the zone, but also some soils within the zone). Since the eastern portion of the Zone is closely linked to Agribusiness Development Zone 2, Wa appears to be a good site for a Special Economic Zone.

ANNEX 2: SUSTAINABLE USE OF WATER RESOURCES

The Volta River is one of West Africa's largest river basins, draining an area of approximately 409,000 km² and providing renewable annual surface water runoff estimated in the range of 38.6¹ to 41.6 billion² m³. The World's largest man-made lake by area (Volta Lake), with 8,502 km² of surface area, is also located within its drainage basin.

Even though water resources in the basin are largely underexploited as of now (estimated abstraction of 0.9 billion m³ per year, 2.2% of total runoff³), uncertainties about future supply (impacts of climate change) and consumption (growing population, urbanization and economic development) of water have driven concerns about the sustainability of water abstraction across the riparian countries.

Different climate change scenarios (IS92a ECHAM4, RCP6.0 and RCP8.5, others) have been used to estimate changes in temperature, precipitation and resultant runoff in the basin, including CSIR-WRI (2000) (decrease in runoff), Kuntzmann and Jung (2005) (increase in runoff) and Andah et. al. (2004) (increase in runoff).

According to the Volta Basin Authority, "although the details are unknown, climate change is extremely likely to be a driver of natural resource use across the basin. Adaptation to climate

change is essential to the long term sustainable development of the Basin and to the utilization of its resources"⁴.

As far as irrigation is concerned, the Food and Agriculture Organization of the UN (FAO) estimated the irrigation potential of Ghana's Volta Basin portion (based on the availability of water and soil resources) at 1,200,000 ha (FAO 1997).

The Agricultural Masterplan proposes to develop 200,000 ha of irrigable land along the next 20 years, with an estimated annual water consumption of 3 billion m³ (7% of all runoff in the Volta Basin and 13% of the Volta runoff generated within Ghana⁵), believed to be sustainable water abstraction rates within the current and future scenarios of water availability. Groundwater as an alternative source, increasingly efficient irrigation methods⁶, climate-smart agriculture and good agricultural practices should also contribute to the sustainability of irrigation water use.

Another concern regards the potential reduction of power generation at the downstream hydropower plants (Akosombo and Kpong). Increased consumptive water use should actually contribute to reduce power generation at these 2 plants, but irrigation, on the other hand, should also contribute to increased renewable energy generation from biomass.

¹McCartney, M.; Forkuor, G.; Sood, A.; Amisigo, B.; Hattermann, F.; Muthuwatta, L. 2012. The water resource implications of changing climate in the Volta River Basin. Colombo, Sri Lanka: International Water Management Institute (IWMI). 40p. (IWMI Research Report 146). doi:10.5337/2012.219

²Winston E.I. Andah, Nick van de Giesen, Charles A. Biney. Water, Climate, Food, and Environment in the Volta Basin.


³SOURCE: UNEP-GEF Volta Project, 2013. Volta Basin Transboundary Diagnostic Analysis. UNEP/GEF/Volta/RR 4/2013

⁴SOURCE: UNEP-GEF Volta Project, 2013. Volta Basin Transboundary Diagnostic Analysis.

UNEP/GEF/Volta/RR 4/2013

⁵As a basis for comparison, we provide here data on irrigation water use as % of renewable water resources for selected countries based on the FAO Water Database: 1) India = 36%; 2) Mexico = 14%; 3) Spain = 21%.

⁶Irrigation systems efficiency is usually underestimated as a factor to increase sustainability of water resources usage for irrigation. Currently, the main irrigation technique used across the basin is flood irrigation, with very low levels of water application efficiency (50%-60%). Centre Pivot and drip can increase such efficiency to 90%-95%, so the potential to increase surface under irrigation with reduced water consumption is largely available.



Existing, commercial-scale technology can ensure, for example, that 240,000 MWh/annum of practically carbon-neutral, dependable renewable energy (a 48 MW power station) can be generated from a 20,000 ha sugar-cane plantation. African Sustainable Plantations Development, an independent power producer established in the Seine West District of the Brong Ahafo Region, plans to establish a 60 MW power station (426,000 MWh/annum) with a 21,500-ha eucalyptus plantation as feedstock.

Waste from agriculture and agro-processing of rice, maize, cassava and many other crops can also contribute feedstock to renewable energy generation. If solar (photovoltaics and concentrated solar power) and the high-potential wind power sites found across the Northern Savannah (Gambaga, Northern Region; Nkwanta South, Volta Region and Kintampo/Amoama (Brong Ahafo Region) are added to the equation, it can be assumed that whatever energy losses may occur at Akosombo and Kpong as a consequence of increase consumptive water use, they can be compensated by the production of power from alternative resources.


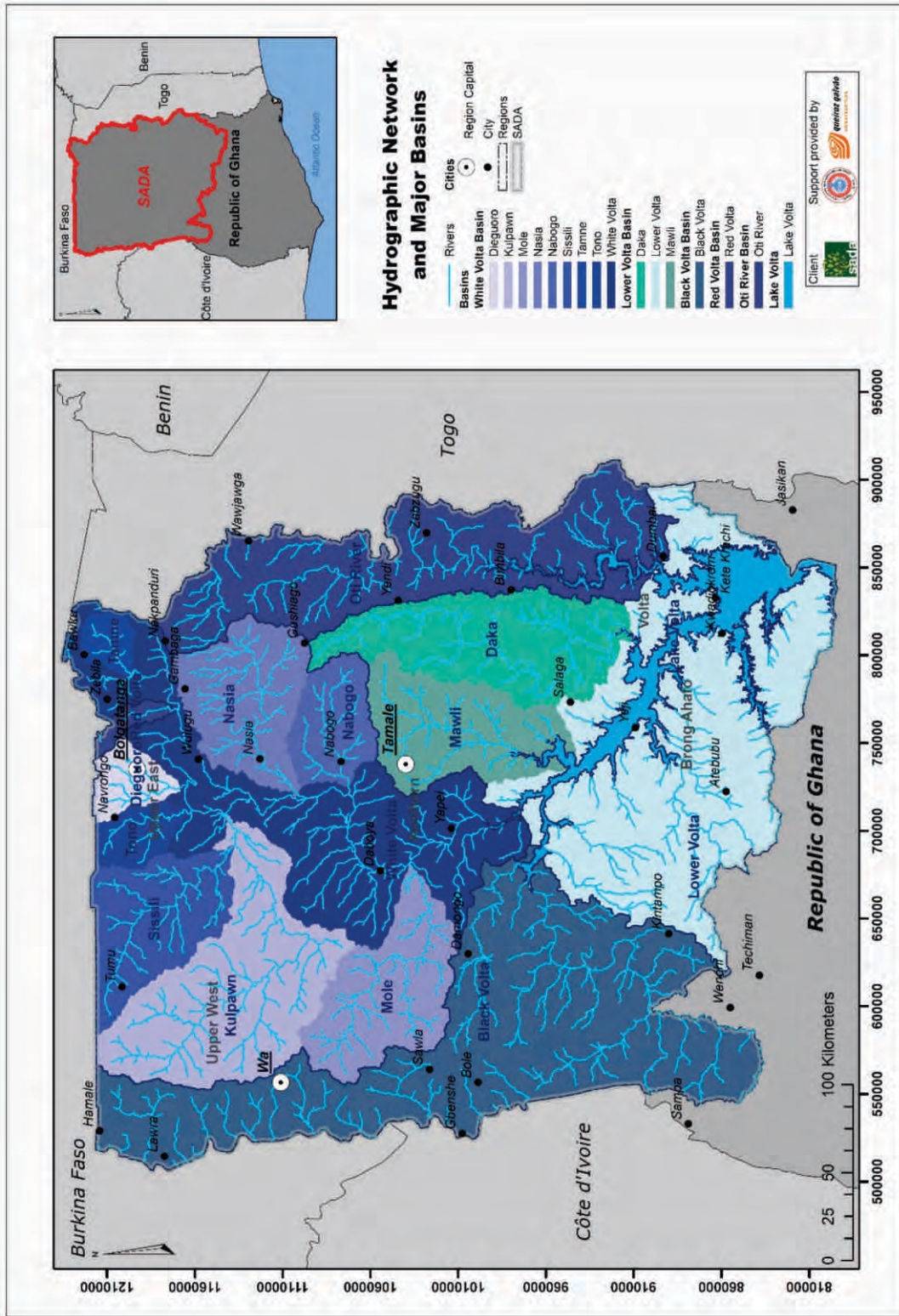


Figure 4: Hydrographic Network and Major River Basins in the Northern Savannah Ecological Zone



Source: Resources and Masterplan for the Transformation of Agriculture in the SADA Zone

ANNEX 3: PROPOSED STRATEGIC PILLARS, FRAMEWORK PROGRAMS AND POLICY PROJECTS FROM SADA'S AGRICULTURAL MASTERPLAN

Strategic Axle	Framework Program	Project
Establishment or improvement of the key hard (infrastructure), soft (policies, institution) structures and information systems	Development of world-class research and extension services	1. Agricultural Research Improvement Project
		2. Extension Services Improvement Project
		3. Farmer field schools development project
		4. Agricultural technical secondary (high school) schools development project
		5. Plant and animal genetics improvement and development project
		6. Permanent Crop and climate-modelling laboratory development project
		7. Enhancement and expansion of hydrometric and meteorological stations cover development project
		8. Project to implement the necessary infrastructure and develop human resources for a permanent annual climatic risk agricultural zoning ¹
		9. Permanent Early Warning and Emergency Preparedness System Task Force Development Project
	Land management and farmers services support framework	10. Farmland, farmers, farmers services and secure payments Registration System Project
		11. SADA Land Trust or Land Bank Development Project (land reserves small, medium and large-scale agricultural projects)
	Investment, Finance and rural credit development framework	12. SADA Investment Bank development project
		13. Rural Credit Improvement Project
		14. Rural Credit Improvement for Large-Scale Projects
		15. Rural Credit Improvement for smallholders and farmer-based organizations
		16. Climate-based risk insurance development program
	Strategic Policies Framework	17. Seed policy enhancement development project
		18. Preferential water and power tariffs for agriculture development project
	Social and production-targeted infrastructure development framework	19. Large and medium-scale irrigation schemes development
		20. Small-scale irrigation schemes development project
		21. Performance-based Water Users' Associations development project
		22. Feeder-road improvement and expansion development project
		23. Irrigation targeted power generation, transmission and distribution development project

¹ Projects 6, 7, 8 and 16 are all interconnected. Improving the meteorological observation network coverage is essential to feed into crop and climate modelling skills. The later will then contribute to develop climatic risk agricultural zoning on an annual basis. The zoning, based on extensive climatic parameters, trends and edaphic factors, will be able to indicate, on a very detailed basis (e.g. district level), the optimum seeding date (10-day intervals), based on climatic and edaphic factors (water holding capacities of loamy, sandy and other soils), for increased chances of success and risk mitigation. To be successful, the zoning has to be performed every year, be published into law and guide extension services and farmers to actually comply with the seeding dates. Since risk will be strongly mitigated by following the crop calendars, a whole insurance system should be developed along this practice, bringing down insurance and financing costs. In Brazil, where the system has been employed over the last 2 decades, the climatic risk agricultural zoning saves the country hundreds of millions of dollars on avoided climate-induced losses.

Improving and upgrading farm level production on a sustainable manner	Subsistence-to-commercial agriculture transformation and access to improved inputs frameworks	24. Improved inputs supply and management development project (fertilizers, pesticides, herbicides, etc.)
		25. Nucleus out-grower Schemes development project (contractual framework)
		26. Agro parks development project (site selection, planning, feasibility studies)
		27. Fast-track technology dissemination (good agricultural practices and climate-smart agriculture) among smallholders development project
		28. Improved agricultural mechanization development project
	Strategic and priority crops clusters development framework	29. Improved irrigated rice development project
		30. Improved irrigated cotton development project
		31. Improved irrigated vegetables development project
		32. Improved irrigated tree crops development project
		33. Agroforestry and Planted Forests development project
		34. Commercial Aquaculture development project
		35. Commercial Poultry farming development project
	Sustainability and Environmental Development Framework	36. Commercial livestock and improved grazing development project
		37. Protected Water Resources Management Plan Development Project
38. Climate-smart agriculture development project		
39. Bushfire fight, control and prevention brigade development project		
40. Strategic tree nurseries (forest) development project		
41. Fast-track riverine buffer and Afforestation Project		
Launching successful downstream processing and agriculture-based industrialization (agribusiness value chains)	Agribusiness and private investment development framework	42. Agribusiness private investment promotion and development entity project (or an agribusiness promotion unit as a department of SADA)
		43. Large-scale land reserves for private investment development project (under the SADA Land Trust or Land Bank)
		44. Agribusiness Special Economic Zones Development Project
		45. Strategic Single Private Investment Sourcing project (proactive investment promotion by developing tailor-made incentives packages to specific agribusiness companies)
		46. Animal feedstock production development project

ANNEX 4: INVENTORY OF EXISTING AGRICULTURAL PROJECTS IN SADA ZONE

4.1. INTRODUCTION TO NSAICU

The Ministry of Food and Agriculture (MoFA) with funding support from the Alliance for a Green Revolution in Africa set up the Northern Region Bread Basket Coordination Unit (NRBBCU), now renamed, Northern Sector Agriculture Investment Coordination Unit (NSAICU).

The Unit supports MoFA and SADA to effectively exercise their mandate as policy regulator and coordinator of agricultural activities within the Northern region respectively. The Northern region was designated as one of the four bread basket regions in the country and this led to an increase in agricultural activity within the region by development partners. The need then arose for a Coordinating Unit to help synchronize the various interventions that were provided and to minimize the tendency for partners to duplicate their efforts.

To improve upon communication, collaboration, and cross-fertilization of ideas amongst the various development partners and all other stakeholders in the agricultural industry, the Unit, in collaboration with MoFA and SADA established a database of agricultural private stakeholders and NGOs for the three regions – Northern, Upper East, Upper West and the Northern part of the Brong-Ahafo Region. Building up the data for Northern Volta is still ongoing. This databank is to serve as a quick reference point for partner information. Reference is made to this data by incoming program initiators in arriving at the type of interventions to provide and to select appropriate locations. This is to help evenly spread out development across the sixty-three districts within the SADA zone. The information is also available online at nsaicu.sourcegh.com

NSAICU, MoFA and SADA have since established a flagship initiative, the Northern Agricultural

Sector Working Group (NASWG) which brings together agriculture sector stakeholders, mostly donor supported projects to share information on their respective programs amongst other discussions that go to improve agriculture sector programming and implementation. This platform has led to an improved atmosphere for regular communication, joint planning and collaboration amongst stakeholders.

NSAICU is currently being funded by USAID after AGRA funding ended in October 2015. USAID's intervention is testimony to the important role NSAICU plays within the sector and other donor partners are being encouraged to support the sustainability of the Unit.

4.1. INVENTORY OF EXISTING PROJECTS

	IMPLEMENTING AGENCY	NAME OF PROJECT	VALUE	DURATION	DONOR AGENCY	TYPE OF INTERVENTION	OPERATIONAL AREA
1	NATHAN Associates	Ghana Market Development (MADE)	£10m	(4 years)- 2013 to 2017	DFID	Strengthening selected markets by addressing 3 elements of the market system. 1. Supporting functions e.g. Financial services. 2. Rules e.g. through Traditional authorities, GOG ETC. 3. Core market players, e.g. Marketers, input dealers etc.	Northern Savannah Ecological Zone (NSEZ)
2	IFDC	FtF USAID-Agriculture Technology Transfer(ATT)	USD \$22m	5 years (April 2013 - April 2018)	USAID	1. Building the capacity of farmers in Seed and ISFM technologies. 2. Building research capacities to produce demand driven breeder seeds 3. Introducing the use of labour saving technologies. 4. Support to local seed companies. 5. Linking actors to sources of finance e.g. FINGAP	Northern Savannah Ecological Zone (NSEZ)
3	ACDEP/CHF Ghana	Resilient and Sustainable Livelihoods Transformation in Northern Ghana(RESULT) Project	CDN \$ 19m	6 years (August 2012 to August 2018)	DFAT -D & CHF	1. Food Security (Crop, Livestock and aquaculture) 2. Extension services 3. Access to financial services 4. Access to market 5. Assets	Northern Region (10 districts), Upper West (2 districts) & Upper East Regions (4 districts)
4	MEDA	Greater Rural Opportunities for Women(GROW)	USD \$ 20m	6 years (2012-2018)	DFAT -D	Improve food security by helping women grow more nutritious food, adopt simple irrigation systems to increase their yields and connect with markets.	Upper West Region (11 Districts)
5	Ministry of Food and Agriculture (MoFA)	Ghana Commercialization of Agriculture (GCAP)	USD \$145m	7 years (July 2012- September 2019)	World Bank and USAID	1. Improving access to secured land for investment 2. Establish or expand nucleus out-growers schemes in the SADA zone Facilitate business development through the provision of grants to strengthen the capacity of eligible farmer's organizations, input dealers, mechanization centres, processors and other agricultural service providers along the value chain. 3. Strengthening out-grower, contract farming systems 4. Finance the rehabilitation and construction of agricultural storage infrastructure and processing facilities in the SADA zone,	Northern Savannah Ecological Zone (NSEZ)
6	World Vision International	Food Security & Economic Development (FSED) Farmer Managed Natural Regeneration Project - (FMNRP)		2014 - 2019 (FSED) 2013 - 2017	Korea Support office DFATD Canada	1. FMNR community trainings on bush fire prevention, tree growing & bye-laws, group dynamics etc. 2. Capacity building on composting, environmental protection & community cash savings methodology. 3. Bullock services support	Northern, Upper East & Upper West Regions
7	IITA	Africa Research in Sustainable Intensification for the next Generation. (Africa Rising) Phase II		5 years (2016 to 2021)	USAID/FtF	1. Community analysis 2. Multi-stakeholder partnerships – R4D platforms 3. Crops and cropping systems 4. Ruminant production 5. Rural poultry production 6. Rural pig production 7. Nutrition education 8. Technology dissemination	Northern (2 districts), Upper East (2 districts) & Upper West Regions (2 districts)

8	Ministry of Food and Agriculture (MoFA)	Northern Rural Growth Program (NRGP)	USD \$ 103.55 M	8 years (2008-2016)	GOG/IFAD/AFDB	<ol style="list-style-type: none"> 1. Strengthening Farmer Based Organisations (FBO) 2. Establishing District Value Chain Committees (DVCCs) 3. Development of Value Chain Organizations 4. Establishment of Productivity Investment Fund 5. Small scale irrigation development 6. Marketing infrastructure Development 7. Capacity Building of Financial Institutions, Financial NGOs 8. Matching Grants 9. Credit Delivery and Administration 	Northern Savannah Ecological Zone (NSEZ)
9	ACDI/VOCA	Agriculture Development and Value Enhancement Project 2 (ADVANCE 2)	USD \$ 35m	4 years 8 months (2013-2018)	USAID/FTF	<ol style="list-style-type: none"> 1. Provide Business Services 2. FBO Development 3. Trade and Marketing 4. Agriculture Production Services-Input, technologies 5. Policy and Advocacy 6. Maize, Rice and Soybean Production 	Northern Savannah Ecological Zone (NSEZ)
10	Ministry of Food and Agriculture	Rice Sector Support Project	EUR 17m	8years (2008-2016)	AfD	<ol style="list-style-type: none"> 1. Land Development 2. Access to Credit 3. Support to Adaptive Research 4. Stakeholders Capacity Building 	Northern (13 districts), Upper East (5 districts), Upper West (4 districts) & Upper Volta (5districts)
11	Innovation for Poverty Analysis (IPA)	Disseminating Innovative Resources and Technologies (DIRTS)	~USD \$3m	3years (January 2014 to March 2016)	USAID	<ol style="list-style-type: none"> 1. Extension Services 2. Inputs Supply Services 3. Insurance Services 	Northern Region (13 districts)
12	SARI/TRIAS/AMIS G	Quality Rice Project	USD \$ 1.4m	3years	AGRA	<ol style="list-style-type: none"> 1. Formation and profiling of FBOs in rice production, processing and Marketing. 2. Building capacity of FBOs in group dynamics 3. Getting them registered as legal entities under the Ghana Cooperative Law 4. Onion Production 5. Access to quality seeds 6. Building capacity of farmers on GAP 7. Creating awareness on ISFM 	Northern, Upper East & Upper West Regions
13	Themonic International Incorporated	Agriculture Policy Support Project (APSP)	USD \$ 15m	5year (2013-2018)	USAID	<ol style="list-style-type: none"> 1. Policy formulation and implementation 2. Policy Research 3. Policy Advocacy 	Northern Savannah Ecological Zone (NSEZ)
14	USAID-Global Communities	Resiliency in Northern Ghana (RING) Project	USD \$30m	5 years	USAID	<ol style="list-style-type: none"> 1. Agriculture and Livelihood 2. Nutrition, Sanitation and Hygiene 3. Building Capacity of District Assemblies 	Northern Region (17 districts)

15	Carana Corporation	USAID-Financing Ghanaian Agriculture Project (USAID-FinGAP)	USAID	5years (2013-2018)	USD \$ 25m	Financing Agriculture-Linking Farmers and ABCs to credit	Northern Savannah (NSEZ)
16	Africa Rice Centre, SARI & ATTP	USAID Rice Seed Scaling Project	USAID	3years (2014-2017)	USD \$1m	Targeted at rice seed systems enhancement	UER & NR
17	SARI, CRI, GRIB & AMSIG Resources	Improvement and Scaling Up of the System of Rice Intensification (SRI)	WAAP 2A, GOG & CORAF	3years (2014-2017)	USD \$1m	Rice Productivity Improvement	UER & NR
18	SARI, CRI, Mo FA & CIRAD	RSSP-Enhanced Adaptive research responsive to environmental needs of the ecological zone	GOD & AFD	6years	EU 600,000	Rice Productivity Improvement & Soil Health restoration	UER, NR & UWR
19	Winrock(prime) International, Technoserve, NCRC & CECOTAPS	Agriculture Natural Resource Management Project (AgNRM)	USAID	5 years (May 2016-May 2021)	USD\$ 25m	1. Improved food production and increased household incomes through sustainable, agriculture and natural resource protection management plans that create expanded connections between existing and new natural resource-based economic activities (i.e., shea production and sales). 2. Protection of existing native forest lands, improvement of soil fertility, and food production applying Conservation Agriculture strategies and practices. 3. Focus on women production groups in alternative agricultural activities.	Northern (4 districts), Upper East (2 districts) & Upper West Regions (3 districts)
20	ADRA Ghana/ ASA/WISHH/ Kansas State University	Assist in the Management of Poultry and Layer Industries with Feed Improvement and Efficiency Strategies (AMPLIFIES)	USDA FFP	5 years (October 2015- September 2020)	USD \$ 4.2m	1. Increase agricultural productivity in the poultry value chain by increasing the quantity and lowering the cost of poultry feed through the reduction of post-harvest loss and procurement inefficiencies of primary feed ingredients; 2. Increase agricultural productivity in the poultry sector by improving poultry feed quality through the improvement of feed testing capacity and the demonstration of the benefits of quality feed; 3. Increase trade of eggs through awareness campaigns and the trade of commercialized poultry feed through improved distribution networks.	Brong Ahafo (6 districts), Ashanti (7 districts), Greater Accra (6 districts) & Northern Regions (7 districts)
21	Care International/Action Aid/ SEND Ghana & WANEP	Northern Ghana Governance Activity (NGGA) Project	USAID	5yrs (2016 to 2021)	USD\$11.4 m	1. Improving agricultural production by focusing on governance deficits. 2. Strengthen institutional capacity for effective co-ordination and integration 3. Create an enabling environment for multi-stakeholder dialogues in decentralization and agricultural development. 4. Enable government and civil society to effectively mitigate conflicts related to agriculture and natural resource management.	26 districts in the Northern, Upper East & Upper West Regions

22	WFP-Ghana	Enhanced Nutrition and Value Chains in Ghana (ENVAC)	US\$ 7.9 million (Est. partners contribution)	5 years (2016-2020)	WFP	1. Increased Local production, improved quality & market integration of nutritious food staples 2. Enhanced Local Processing Capacity for complementary nutritious foods 3. Improved adoption and utilisation of good nutrition practices	Ashanti, Brong Ahafo, Upper West, East and Northern regions
23	MoFA	Ghana Agriculture Sector Investment Programme (GASIP)	US\$ 113m	9 years	GoG/IFAD	1. Linking smallholder Producers to agribusinesses to enhance pro-poor growth; 2. Nationwide scaling up of a successful value chain investment approach; 3. Promoting and mainstreaming climate change resilience approaches in Ghana, in particular in the northern regions 4. Knowledge management, harmonization of intervention approaches and policy support.	Nationwide Programme
24	MoFA	MoFA/JICA Project for sustainable Development for Rain-fed Lowland Rice Production Phase II (Tensui Rice Project, Phase 2)		5 years (from 2016 to 2021)	JICA	Dissemination of Rice Extension Guidelines through capacity development of regions and district in line with decentralisation process	Ashanti (20 districts) & Northern Regions (15 districts)
25	MoFA, Ghana Health Services, Ghana LEAP Project, UNICEF, and RING	Strengthening Partnership, Results & Innovations in Nutrition Globally (SPRING)		3 years (2014-2017)	USAID	Health and Nutrition Education	Northern (10 districts) & Upper East Region (5 districts)
26	MoFA, ACDEP, SARUDEP, SARI, GMET & Farm Radio International	Adaptation of Agro-Ecosystems to Climate Change in Ghana (AAESCC)	...	5 ½ years (July 2012 – December 2017).	Federal Ministry for Economic Cooperation and Development (BMZ), Germany	1. Enhancing Soil fertility on Farm Land 2. Appropriate measures in Soil and Water conservation 3. Support to Agro Forestry measures 4. Prevention of Bushfires 5. Support to CIGs in the subject matter areas 6. Collection and Analysis of weather data 7. Extension on Climate Change and Adaptation to Agriculture 8. Training of Farmers in Seed production, GAP and seed conservation measures 9. Testing of weather forecasts on Farmers Mobile phones	Northern Region (4 districts) and Brong Ahafo (5 districts).
27	ADRA	INTAPIM	USD \$1,049,764 (Closed)	3 years (October 201 to September 2015 (Closed))	AGRA	1. Train Volunteer Extension Workers 2. Provide agricultural extension services to FBOs 3. Collaborate with seed companies to produce certified seeds (using drought-tolerant varieties from SARI) 5. Value chain linkages 6. Capacity building 7. Partnerships 8. Credit Support 9. Field Demonstrations	Northern Region (10 districts)

28	GGC	Ghana Warehouse Receipt Promotion (G-WARP) Project	USD \$777,662	3years	AGRA/USAID	<ol style="list-style-type: none"> 1. Warehouse certification and licensing 2. Warehouse construction 3. Post-harvest management 4. Inventory financing 5. Advocacy: -promotion of Grades and Standards 6. Market Information Systems; -Price information dissemination 	Northern Region (6 Districts)
29	IFDC	Agriculture Value Chain Mentorship Project (AVCMP)	USD \$683000 (Closed)	3years (June 2011 to May 2014)-Closed	DANIDA/AGRA	<p>Improving Entrepreneurial and technical skills of FBOs, agro dealers, small and medium sized enterprises in the following areas:</p> <ol style="list-style-type: none"> 1. Training in group dynamics. 2. Establishment of demonstration farms. 3. Facilitation of bulk purchase of inputs. 4. Facilitation to output markets 5. Linkages to credit sources. 	Northern Region (16 districts)
30	SNV	Competitiveness of Sesame Value Chain in Ghana	EU 600,000	2 years (May 2013 to December 2015)Closed	Directorate General for International Cooperation of the Netherlands (DGIS)and IFAD through NRRG	<ol style="list-style-type: none"> 1. Value Chain Development in promoting production, utilization and marketing of sesame 2. Value Chain Development in promoting local rice production and consumption 3.Value Chain Development in promoting the identification, production& utilization of shea, baobab, moringa, 4. Increasing access to structured demand market structures opportunities of Procurement Governance for Home Grown School Feeding Project (PGHGSFP) and promoting favourable procurement practices on the part of public institution & private sector 	Northern (8 districts), Upper East (3 districts) &Upper West Regions(3 districts)
31	Farm Radio International, RAINS, TUDRIDEP, Trade Aid	Climate Change Adaptation in Northern Ghana Enhanced (CHANGE) Project	USD \$2m (Closed)	2 years	DFAT -D	<ol style="list-style-type: none"> 1. Climate Change Adaptation 2. Extension 3. Livelihood 	Northern Region
32	IIITA	Africa Research in Sustainable Intensification for the next Generation. (Africa Rising) Phase I		5 years (2012 to 2016) Closed	USAID/FF	<ol style="list-style-type: none"> 1. Community analysis 2. Multi-stakeholder partnerships – R4D platforms 3. Crops and cropping systems 4. Ruminant production 5. Rural poultry production 6. Rural pig production 7. Nutrition education 8. Technology dissemination 	Northern (2 districts), Upper East (2 districts) &Upper West Regions (2 districts)
33	World Food Program	Purchase for Progress (P4P)	USD \$5m (closed)	5 years (October 2010 to September 2015)	DFATD Canada	<ol style="list-style-type: none"> 1. Capacity Development and Supply-side Partnerships 2. Support to Emerging Structured Trading Systems (warehouse receipt systems) 3. Support Small and Medium Traders 4.Developing Local Processing Capacities 	Northern Region (2 districts)

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