AFRICAN DEVELOPMENT BANK GROUP

MULTINATIONAL

TECHNOLOGIES FOR AFRICAN AGRICULTURAL TRANSFORMATION: FRAMEWORK PROGRAM IN SUPPORT OF "FEED AFRICA"

AHAI

November 2017

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CURRENCY EQUIVALENTS

As of September 2017

1 UA	=	USD 1.38
1 UA	=	EURO 1.23

WEIGHTS AND MEASURES

1 metric ton	=	2,204 pounds (lbs)
1 kilogram (kg)	=	2.200 lbs
1 meter (m)	=	3.28 feet (ft.)
1 millimeter (mm)	=	0.03937 inch
1 kilometer (km)	=	0.62 miles
1 hectare (ha)	=	2.471 acres

ACRONYMS AND ABBREVIATIONS

ADF	African Development Fund
APSA	Agriculture Productivity Program for Southern Africa
ATA	Agricultural Transformation Agenda
ATPS	Agricultural Technology Policy Studies
AWARD	African Women in Agriculture Research & Development
BMGF	Bill & Melinda Gates Foundation
CAADP	Comprehensive African Agricultural Development Program
CTDC	Commodity Technology Delivery Compact
CGIAR	Consultative Group on International Agricultural Research
CIAT	Centro Internacional Agricultura Tropicale
CIMMYT	International Maize and Wheat Improvement Center
CSA	Climate Smart Agriculture
CSP	Country Strategy Papers
DFID	Department for International Development, U.K.
EAAPP	East African Agriculture Productivity Program
ENABLE	Empowering Novel Agribusiness-Led Employment
FARA	Forum for Agricultural Research in Africa
GAPs	Good Agricultural Practices
GES	Growth Enhancement Support
IARC	International Agricultural Research Centers
ICARDA	International Centre for Agricultural Research in Dry Areas
ICRAF	International Council for Research in Agro-Forestry (World Agroforestry Centre)
ICRISAT	International Crops Research Institute for Semi-Arid Tropics
IFAD	International Fund for Agricultural Development
IFDC	International Fertilizer Development Cooperation
IITA	International Institute of Tropical Agriculture
ILRI	International Livestock Research Institute
IPDM	Integrated Pest & Disease Management
IWMI	International Water Management Institute
JICA	Japan International Cooperation Agency
LATA	Liberia Agricultural Transformation Agenda
NARES	National Agricultural Research & Extension Systems
OCP	Office Cherifien de Phosphate
PIAs	Priority Intervention Areas
RBLF	Results-Based Logical Framework
RTDI	Regional Technology Delivery Infrastructure
RMC	Regional Member Country
RF	Rockefeller Foundation
RPG	Regional Public Good
SARD-SC	Support to Agricultural Research for Development of Strategic Crops in Africa
SROs	Sub-Regional Organizations
SSV	Swollen Shoot Virus
TAAT	Technologies for African Agricultural Transformation
WAAPP	West African Agriculture Productivity Program
WB	World Bank
WEMA	Water Efficient Maize for Africa

EXECUTIVE SUMMARY

Program Overview

1.1 More than 160 million Africans (about one in four Africans) are food insecure and malnourished, making Africa the most food-insecure region in the world. More than 32 million African children under five are underweight, of which nearly 10 million are severely underweight, and 14.3 million are wasted, with low weight for their height. Africa's recent economic gains are at risk if this is allowed to continue. Low agricultural productivity and value addition are at the heart of the malnutrition, employment and income challenges on the continent. The agricultural sector accounts for between 50 and 70% of employment in African countries, but produces only 25% of Africa's Gross Domestic Product (GDP).

1.2 Asia was in a similar position in the 1960s but 20th century scientific advances in agriculture developed by a number of International Agricultural Research Centers (IARCs) in Latin America and Asia were applied, leading to the Asian "green revolution". These centers became the Consultative Group on International Agricultural Research (CGIAR) and together with countries in Asia they catalyzed one of the greatest increases in food production and improved nutritional well-being such as the world has ever known. Today, the technologies exist to feed Africa, if widely deployed. They include high yielding crop varieties and livestock breeds, bio-fortified crops such as pro-vitamin A rich cassava, high iron and zinc rice, and high zinc sorghum, which if scaled up can help address the problems of malnutrition and stunting of African bodies and minds. Africa has more food production technologies available today than Asia had at the time of its green revolution. What is missing is taking these technologies to farmers at scale. Also missing has been a well-coordinated food production technology delivery platform to help address all of the related issues of extension (training), policy, market, institutional, R&D, and regulatory issues hindering the widespread use of technologies.

1.3 The Bank seeks to focus the technically excellent but hitherto uncoordinated efforts of CGIAR and their work with National Agricultural Research and Extension Systems (NARES), in particular as represented by their continental umbrella, the Forum for Agricultural Research in Africa (FARA) and Sub-Regional Organizations (SROs). The result will be a Regional Technology Delivery Infrastructure (RTDI), with emphasis on agro-ecological zones and their priority commodities that will reach 40-50% of all African farmers with the most relevant food production technologies by 2025. The overall goal of TAAT is to radically improve agriculture as a business across Africa by deploying agricultural productivity-increasing technologies within eight Priority Intervention Areas (PIAs): i) Self-sufficiency in Rice Production, ii) Cassava Intensification, iii) Food and Nutrition Security in the Sahel, iv) Transforming African Savannahs into Breadbaskets, v) Revitalizing Tree Plantations, vi) Expanding Horticulture, vii) Increasing Africa's Wheat Production, and viii) Achieving Self-sufficiency in Inland Fish Production. Within these PIAs, nine (9) agricultural commodities are prioritized. TAAT is designed as a Framework Program that allows partners (the World Bank, AGRA, BMGF, IFAD, etc.) to contribute resources and to expand country coverage over time. The Bank's PY1 funding will be UA 29 MILLION (US$ 40 MILLION) in grants to finance the centrally managed activities (for ADF-only countries while partner resources will initially target ADB countries). Similar amounts will be sought for PY2 and PY3. Further, the Bank is expected to provide close to US$350 million through its normal country lending programs, beyond the central activities, towards areas that will support development of agricultural value chains, market and infrastructure and access to finance, all of which will bolster the success of agricultural transformations at the country level.

1.4 And while TAAT is a key platform for driving the Feed Africa strategy of the Bank, the resources needed to achieve the objectives of Feed Africa are huge and well beyond what could be achieved alone. So the Bank is developing strategic alliances and partnerships to help mobilize resources to achieve the objectives. TAAT is planned as a multi-donor financing platform to help take proven agricultural technologies to scale across Africa. The fundamental guiding principles of TAAT are: technology matters; scale matters; the policy and regulatory environment matters; and partnerships matter.

1.5 A successful green revolution in Africa must be inclusive and based on a recognition that agricultural transformation and women's empowerment are inextricably linked. Addressing the gender disparities that persist in African agriculture presents a tremendous opportunity to unlock the potential of African agriculture. The agricultural sector in Africa is the largest employer of women; 62% of economically active women are working in the sector, while in countries such as Rwanda, Malawi and Burkina Faso, over 90% of economically active women are involved in agricultural activities. Yet depending on the country, the rural wage gap between men and women in Africa is estimated at between 15-60%. Research also indicates that women farmers are just as efficient as male farmers when granted equal access to inputs and skills. TAATwill systematically incorporate consideration for gender equality and ensure women's equal access to agricultural technologies.. For TAAT will prioritize the needs of women to level the playing field and increase agricultural productivity to achieve impact.

1.6 TAAT is a strategic alliance with the goal of mobilizing $1 billion towards its goal of scaling up agricultural technologies. The Bank and the World Bank have been working actively together on conceptualizing TAAT for the past close to two years. The World Bank initially planned to put US$500 million towards TAAT partnership in countries, an amount it announced would be increased to $700 million during the multi donor discussion on the planned initiative during the World Food Prize events in Des Moines, Iowa in October 2017. The other members of the TAAT alliance will include the Bill and Melinda Gates Foundation, the Rockefeller Foundation and the Alliance for a Green Revolution in Africa (AGRA), all of whom have committed significant resources. Indeed, the Bill and Melinda Gates Foundation has already approved its financing support to the TAAT central coordinating platform housed at IITA, which will be described below.

1.7 Other institutions have been actively participating in TAAT's conceptualization, including the Food and Agriculture Organization of the United Nations, the International Fund for Agricultural Development, Agence Française de Development, DFID, USAID and other bilateral institutions and the private sector. Several of these institutions expect to collaborate on TAAT and also to co-finance national level interventions through parallel financing. It is worth noting that at the World Food Prize events in Iowa, which brought together the world's leading agriculture experts, TAAT was seen as potentially the "most significant effort to pull resources together to deliver technologies at scale across agroecological zones to farmers in Africa".

1.8 TAAT aligns with the twin objectives of the Bank's Ten Year Strategy (TYS), inclusive growth and transition to green growth, with agriculture as one of the three areas of special emphasis. It also resonates with four of the Bank's five corporate priorities (Feed Africa, Industrialize Africa, Integrate Africa and Improve the quality of lives of Africans), encapsulated in the High 5s. In addition, TAAT is strongly anchored on the Feed Africa agenda, endorsed by African leaders at the High-Level Conference held in Dakar in October 2015, which itself was anchored on the African Union's Malabo Declaration, as well as Sustainable Development Goals (SDGs) 1 and 2 of eradicating extreme poverty and ending hunger and malnutrition. Given the agro-ecological perspective of the PIAs, TAAT contributes to the Regional Integration Policy and strategy (2014-2023) and is aligned with the transition states strategy in applicable RMCs of the Bank. TAAT is also anchored around previous projects supported by the Bank, namely: i) the "Support to Agricultural Research for Development of Strategic Crops in Africa" (SARD-SC), which funded research on four of the six strategic crops of the African Union (Cassava, Maize, Rice and Wheat), following a value chain approach; ii) the project to deploy the New Rice for Africa (NERICA) in seven African countries – a project that won the U.S. Treasury award in 2014; iii) the project on the Promotion of Science and Technology for Agricultural Development in Africa (PSTAD) implemented in 34 RMCs; and iv) various research-for-development projects (in Cameroon, Tanzania, and other countries) that contributed some of the proven agricultural development technologies selected for deployment in TAAT.

1.9 Knowledge gained from implementation of prior agricultural research operations and other regional projects, particularly on the need to build country capacity for project implementation and delivery, has been taken into consideration in the design of TAAT. Similarly, the knowledge generated

from TAAT will be used to design, manage, and implement similar Bank-financed projects in the future. Through M&E, knowledge related data will be collected throughout implementation. Data will be analyzed and the results used to improve project implementation in real time.

1.10 All African countries are eligible to participate in TAAT based upon a commitment to enact policies that facilitate the uptake of food production technologies, strengthen National Agriculture Research and Extension Systems (NARES), and participate in activities agreed upon with the CGIAR consortiums and Sub-Regional Organizations (SROs) under TAAT. They will be supported through centrally managed technology deployment compacts or country programs in which the Bank collaborates with partners (e.g., WB, AGRA, BMGF, and IFAD) to incorporate TAAT components into agricultural value chain development programs. The TAAT program consists of four major components namely: i) the creation of an enabling environment for deployment and adoption of food production technology by famers, in particular vibrant seed systems or artificial insemination programs, technology release and registration policies that are regionally harmonized, and regional programs to combat pest and disease threats; ii) a Regional Technology Delivery Infrastructure (RTDI)—a consortium of CGIAR centers, NARES, and SROs. These form the TAAT platform, which is able to provide and deploy needed food production technologies and any additional adaptive research required; iii) deployment of appropriate food production technologies, through crop/livestock campaigns in RMCs; and iv) project management.

1.11 Operationally, TAAT will function as follows: The Regional Technology Delivery Infrastructure (RTDI) made up of CGIAR centers and other technology providers, will develop a menu of proven food production technologies in nine priority commodities. These include seed systems or artificial insemination programs for best bet crop varieties/livestock breeds for large scale deployment; protocols for disease control on a regional basis; farmer education in improved crop/animal production methods; aquaculture, etc. RMCs, as represented by NARES, will work with the CGIAR centers to prepare proposals, based on the menu of food production technologies, for outreach campaigns; the proposals will be submitted to the decision-making body of the RTDI, the Clearinghouse (details in ***Appendix 1***). Once proposals are approved, funds will be released for execution but the Clearing house will continue to provide oversight during execution. TAAT is not a research program but takes food production technologies that exist—the result of decades of research efforts—to millions of farmers via crop/livestock outreach campaigns and the creation of an enabling environment working with the researchers themselves.

1.12 The food production technologies to be deployed under TAAT have the features of Regional Public Goods (RPGs) namely: (i) non-rivalry, (ii) non-exclusivity, (iii) broad public interest and benefit, (iv) strong alignment with the Bank's strategic orientation and continental and regional objectives; (v) catalytic and upstream role, and (vi) higher developmental impact through cooperation. Food production technologies being deployed will be available to all stakeholders in the target agro-ecological zones or commodity belts for free. No country will be excluded. Key related lessons learned will include the stronger working relationships between the CGIAR centers and NARES, and the experience in working across multiple countries with similar agro-ecological zones, among others.

1.13 TAAT will allow donors to work together through a well-coordinated regional technology delivery platform, for appropriate technologies to be deployed to millions of farmers across Agro-ecological zones. It will bring to bear the joint collective effort of international, regional and national agricultural systems to improve connections between research and extension and reform regulatory systems that impede speedy transfer of technologies across borders..

1.14 By going to scale on the Priority Intervention Areas (PIAs), TAAT's key benefits include (i) increased agricultural productivity and diversification, leading to improved food and nutrition security, (ii) job creation through expanded commercialization and industrialization, (iii) improved socioeconomic status of farmers including women and youth due to higher incomes, (iv) reduced vulnerabilities to market price fluctuations due to reliable supply leading to better organized markets,

(v) improved soil, land and water management practices due to Good Agricultural Practices (GAPs), and (vi) increased resilience to climate variability and stress through the deployment of Climate Smart Agriculture (CSA) technologies and innovations. TAAT will make a significant contribution to Feed Africa's key agricultural development objectives, which are *1) eliminating extreme poverty, 2) ending hunger and malnutrition, and 3) achieving food self-sufficiency and turning Africa into a net food exporter.*

1.15 Projections based upon overall project design and assumptions developed for the larger Feed Africa strategy, as well as World Bank and AGRA programs, *suggest that TAAT, by scaling up food production technologies, will result in 120 million tons of additional raw food production per year, will assist about 40 million beneficiaries (11.7 million households), and lead to increased food production valued at $1.7 to $2.8 billion resulting from an $850 million investment by the end of the program.*. Investments in TAAT will be greatly compounded by larger loans/grants awarded to RMCs through Feed Africa.

1.16 Management hereby seeks Board approval for the first year resources (PY1) from the Regional Public Good (RPG) window and will return in subsequent years (PY2 and PY3) with further requests and also for specific country programs.

Results Based Logical Framework

Country and program name: **Multinational – Technologies for African Agricultural Transformation (TAAT)**

Purpose: To **"rapidly expand access of smallholder farmers, the majority of whom are women, in low-income RMCs to high yielding agricultural technologies to improve their food production, assure food security and raise rural incomes, and provide regional public goods by scaling up agricultural technologies across similar agro-ecological zones**

RESULTS CHAIN		PERFORMANCE INDICATORS			MEANS OF VERIFICATION	RISKS/MITIGATION MEASURES
		Indicator (including CSI)	Baseline (2017)	Target (2020)		
IMPACT	**Enhanced food and nutrition security, reduced poverty and improved livelihoods**	**1. Population are more food secure (of which women will be 50%)** **2. Prevalence of stunting among children under 5 (disaggregated by gender)**	**1. 20% of Africans are food insecure** **2. 31.2% for African region (ranges 31.7% to 42.6%**	**1. 40% reduction** **2. 30% reduction**	**1. Annual country food security status report.**	
OUTCOMES	**Increased income (inclusively)** **Increased agriculture commodity productivity**	• **Household income** • **Crop productivity** • **Livestock productivity**	• **US$1,650** • **As in Appendix 2**	• **50% increase** • **30% - 50% increase**	**1. Annual National Bureau of Statistics** Reports. 2. Annual Report of Ministry of Agriculture	**Risk:** Lack of enabling environment (policy, market, etc.) **Mitigation:** Fact-based & targeted advocacy **Risk:** Lack of commitments of stakeholders in implementation **Mitigation:** Active engagement of all stakeholders, with clear roles
	Increased employment (inclusively)	• **No. of jobs created (of which women & youth) disaggregated by food commodity**	• **0**	• **450,000 (50% women)**		
	Increased food production **Increased food and nutrition security** **Direct TAAT beneficiaries** **Value addition of TAAT**	• **Tons of food (additional) disaggregated by food commodity** • **Household dietary diversity** • **No. of beneficiaries (disaggregated by age and sex)** • **Value of additional production**	• **0** • **0** • **0** • **US$3.29 billion**	• **17 Million MT** • **3 new food/hh** • 10.34 million hhs (2027) (50% women & 25% youth) • **US$4.99 billion**		
	Component 1: Creation of Enabling Environment (EE)					
OUTPUTS	Output 1.1: Policies for deployment and adoption of food production technology policies harmonized across a region	•No. of technology policies harmonized across countries and regions	• 0	• 7 (1/commodity)	1. Qtrly Program Monitoring Reports. 2. Annual CG Center Reports. 3. Annual NARES Reports 4. Qtrly Market Reports	**Risk:** Lack of commitment & logistical support to enable training. **Mitigation:** Sensitization & identification of strategic training partners **Risk: Policy inconsistency on the part of governments & long process in changing policies** **Mitigation: Dialogue using fact-based rationale for losses due to policies *status quo***
	Output 1.2: Capacity of national seed systems built	•No. of weak systems strengthened	• 0	• 7 (1/commodity)		
	Output 1.3: Improved crop varieties and livestock breeds released in one country widely r	•No. of improved crop varieties & livestock breeds widely applied in agro-ecological zones	• 0	• 14 (2/commodity)		

	available for adoption in other countries within a region					**Risk:** Lack of commitment by the youth involved in technology promotion **Mitigation:** Proper orientation on mindset change **Risk:** Lack of cooperation by government agencies **Mitigation:** Dialogue for buy-in **Risk: Lack of enabling environment (policy, market, etc.** **Mitigation: Fact-based & targeted advocacy** **Risk:** Lack of commitment & logistical support to enable training Mitigation: Sensitization & identification of strategic training partners Risk: Lack of availability of off-taker markets **Mitigation:** Facilitate linkages between producer groups and off-takers through commodity marketing agreements.
	Output 1.4: Constraints to technology adoption addressed	•No. of technology adoption constraints removed	• 0	• 14 (2/commodity)		
	Output 1.5: policies for release and registration of food production technologies harmonized	•No. of technology policies harmonized across countries and regions	• 0	• 7 (1/commodity)		
	Output 1.6: Technology promotional activities carried out	•No. of promotional activities with a focus on technologies for safe and nutritious foods	• 0	• 3000 •		
	Output 1.7: Activities carried out to promote the consumption of safe and nutritious foods	•No. of promotional activities	• 0	• 40		
	Output 1.8: Input & output markets accessed	•No. of communities with better access to input & output markets	• 0	• 2,350		
	Component 2: Regional Technology Delivery Infrastructure (RTDI)					
	Output 2.1: Menu of Best-bet food production technologies generated	•No of best-bet technologies scaled out.	• 0	• 21 (3/commodity)		
	Output 2.2: Campaigns for transnational control of pests & diseases designed/implemented	•No. of campaigns implemented	• 0	• 14 (2/commodity)		
	Output 2.3: Crop/Livestock technology delivery compacts convened	•No. of delivery platforms convened	• 0	• 14 (2/commodity)		
	Output 2.4: Young class of 'Agripreneurs' supported Output 2.5: M&E of the platform carried out	• No. of Agripreneurs supported • No. of M&Es of the platform carried out	• 0 • 0	• 5000 • 7 (1/platform)		
	Component 3: Deployment of Appropriate Technologies (DAT)					
	Output 3.1: Trans-national control of pest/diseases facilitated Output 3.2: Appropriate technologies identified and deployed Output 3.3: crop and livestock outreach campaigns Output 3.4: Wide-scale farmer	•No. of trans-national pest & diseases facilitated •No. of technologies identified and deployed •**No. of successful crop/livestock outreach campaigns**	• **0** • **0** • **0**	• **7 (1/commodity)** • **14 (2/commodity)** • **7 (1/commodity)**		

	extension and innovative models designed and implemented	• **No. of wide-scale farmer extension models implemented**	• **0**	• **7 (1/commodity)**		
	Component 4: Project Management					
	Output 4.1: Functional TAAT Program Management	• No. of fiduciary activities handled effectively and efficiently under the TAAT program	• 0	• 20	1. Qtrly Program Monitoring.	**Risk:** Lack of cooperation among Compacts **Mitigation:** Effective team building from the onset.
KEY ACTIVITIES	**COMPONENTS**				**INPUTS**	
	Component 1: Creation of Enabling Environment (EE) UA 12.28 Million 1.1: Harmonize and streamline technology release systems and registration as well as seed system policies across countries and regions (to ensure spillover effects) 1:2: Capacity development of weak seed systems 1:3: Ensure that improved crop varieties and livestock breeds for specific agro-ecological zones are widely applied and used 1:4: Identify and remove constraints to agricultural technology adoption in Africa through appropriate policy audits				**TOTAL PROJECT COST: UA 40.00 MILLION** **ADF Grant: UA 29.00 million (72.50%)** **AGRA: UA 7.25 million (18.10%)** **BMGF: UA 0.85 million (2.10%)** **Government of RMCs UA 2.90 million (7.30%)**	
	Component 2: Regional Technology Delivery Infrastructure (RTDI) UA 9.82 Million 2.1: Identification & selection of best-bet technologies for uptake by RMCs 2:2: Design & develop appropriate campaigns for transnational control of pests and diseases and its implementation 2:3: Convene a Crop/Livestock technology delivery platform of all major actors for each of nine priority commodities 2.4 Engage the CGIARs and other technology providers to develop a menu of proven food production technologies in the nine priority commodities 2:5: Support the development of a young class of 'agripreneurs', through demonstration, training and financing in coordination with ENABLE Youth 2.6: Carry out M&E of the platform					
	Component 3: Deployment of Appropriate Technologies (DAT)Program UA 16.01 Million 3.1: Facilitation of trans-national control of pest and diseases through awareness raising campaigns (that pest and diseases do not respect political boundaries) and development of appropriate protocols 3:2: Deployment of appropriate technologies through crop/livestock outreach campaigns in RMCs 3.3 Design and implement wide-scale farmer extension and innovative models to organize and aggregate farmers					
	Component 4: Project Management (PM) UA 1.89 Million					
	4.1: Management of TAAT fiduciary issues (Procurement, Disbursement, Financial Management)					

Program timeframe

Table 1: TAAT Program Timeframe

Year	2017				2018				2019				2020			
Quarter	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**
Initial Activities																
Internal Processing of Appraisal																
Loan Negotiations																
Board approval																
Grant protocol signature																
Recruitment of Program Staff (Clearinghouse, etc.)/Nomination of Program Steering Committee members																
Satisfaction of conditions for effectiveness & first disbursement																
Program launching/training of program teams in FM & Procurement																
Preparation and validation of procedures manuals																
Preparation & signing of MoUs with various implementing partners																
Component 1: Creation of Enabling Environment (EE)																
Design and monitoring of supporting policies																
Technology survey and assessment																
Assessment of Seed Systems and livestock breeds dissemination systems																
Proposals on crop/livestock campaigns of proven agricultural technologies																
National technology deployment and promotion																
Component 2: Regional Technology Delivery Infrastructure (RTDI)																
Farmers and input dealers registration																
Design and implementation of trans-national campaigns for pests & disease control																
Crop/Livestock technology delivery compact activities																
Support to development of young class of 'Agripreneurs' & Promotion of technologies thru demonstration activit																
Develop a menu of proven food production technologies in the nine priority commodities																
Trainers training of others on the use of technologies & GAPs																
Component 3: Deployment of Appropriate Technologies (DAT)																
Facilitation of trans-national control of pest and diseases (through awareness raising, etc.)																
Development of strategies for deployment of proven technologies																
Design and implement wide-scale farmer and innovative extension models																
Component 4: Program Management (PM)																
Preparation, approval and floating of bidding docs & contract awards for goods, works & services																
Contracts execution for goods, works and services																
Quarterly reports submission																
Annual reports submission																
Program Work plans and Budgets																
Steering committee meetings																
Bank's supervision missions																
Audit																
Mid-term review																
Program Completion Report																

1. INTRODUCTION

1.1 Africa's Agricultural Sector is Underperforming

1.1.1 The African continent has enormous potential for agricultural production. Yet more than 160 million Africans are food insecure and malnourished. This is about one in four Africans, making Africa the most food-insecure region in the world. Every day over 100 million children in Africa go to bed hungry with devastating long-term consequences on their physical and mental development, hobbling their productivity as adults. Indeed, this has led to 58 million stunted African children—short in height for their age—representing an increase of 23% since 1990, despite worldwide declines of 37% over the same period. More than 32 million African children under five are underweight, of which nearly 10 million are severely underweight, and 14.3 million are wasted, with low weight for their height. Simply put, more than a third of African children under five are either moderately or severely underweight. Africa's recent economic gains are at risk if this is allowed to continue.

1.1.2 Related to health and nutrition concerns, low agricultural productivity and value addition are very much at the heart of employment and income challenges on the continent. The agricultural sector accounts for between 50 and 70% of employment in African countries, but produces only 25%, of Africa's Gross Domestic Product (GDP). Consequently, many people work in agriculture for their livelihoods and yet produce and earn very little for it. Furthermore, less than 30% of harvests are processed into value added products compared to 98% in developed countries. Only $40 of value is added to one ton of processed products in Africa compared to $180 in rich countries. These are missed opportunities to create wealth and employment, especially for women who predominate in the population of African farmers today (70–80% of African farmers are women). This places women and their families in precarious situations, exacerbating the health and nutrition challenges already described. To escape this negative feedback loop, increasing agricultural productivity and value addition is key. The interventions described here address productivity issues while other measures being rolled out within the Bank's Feed Africa strategy work on improving value addition.

1.1.3 Why is productivity so low in Africa? For a variety of reasons including poor soils and limited access by smallholder farmers to improved crop varieties and livestock breeds, fertilizer, soil correctives, and appropriate crop production packages. African staple crop yields have barely grown in the last 25 years, and remain the lowest of any region in the world. The productivity of five staple crops—rice, wheat, maize, potato, and cassava—is just over half of the international average. Annual growth of cereal yields was only 1.3% from 1990 to 2014, compared with 4.1% in Brazil during the same period. Strikingly, between 2001 and 2008, agricultural GDP in Africa grew at just 3.4% while overall GDP grew nearly twice as fast, at 6% annually.

1.1.4 In sum, the underperformance of the African agriculture sector leads to low incomes and expensive and often poor quality food, which has a direct bearing on hunger, malnutrition, poverty, and human capital and which hinders economic opportunities in the farm and non-farm sectors alike**.**

1.2 Asia's Green Revolution was the result of Technological and Institutional Innovations

1.2.1 Asia's experience illustrates how rapidly things can turn around with the right actions at a critical time. In the mid-1960s in Asia, rising populations, an underperforming agricultural sector, and consecutive droughts led to significant food shortages, widespread hunger, and malnutrition. However, through spectacular scientific advances in wheat and rice breeding and agronomy, the food crisis was rolled back and India became food secure within four years, by 1970; Pakistan, Thailand, the Philippines and Bangladesh followed soon after. The Asian agricultural phenomenon is estimated to have saved a billion lives and is now known as the 'Green Revolution'.

1.2.2 The Asian experience was inspired by earlier successes in Latin America. The 20th century scientific advances in agriculture that were so successfully applied in Asia had been developed by the Mexican Agricultural Cooperation Program for wheat, established by the Rockefeller Foundation in Mexico City in the 1950s, and by the International Rice Research Institute (IRRI) for rice, created by the Rockefeller and Ford Foundations in Los Banos, Philippines, in the 1960s. This was south-south learning at its best.

1.2.3 And indeed this south-south learning was deliberately supported by global development partners at the time. The World Bank, from the late sixties to the early eighties, provided institutional innovations to deploy and adapt the wheat and rice agricultural technologies to millions of hectares of farmlands in Asia. The World Bank also facilitated the establishment of public institutions at global, regional and country levels combined with policy advice and support to Asian countries, to implement a far-sighted strategy of reaching resource-limited farmers with the best of modern agricultural technology. One of these is the Consultative Group on International Agricultural Research (CGIAR), a global network of agricultural R&D institutions, established in 1972. The CGIAR centers were set up to be international centers of excellence in agricultural innovation, where cutting edge crop and livestock technologies were developed by the world's best scientists and tested and adapted to individual country conditions, in collaboration with the National Agricultural Research and Extensions Systems (NARES). NARES are made up of national agricultural research institutes, universities, public and private extension (training) agencies, farmer organizations, etc., representing the national voices and approaches to agricultural technology development and deployment. It is safe to say that the Asian Green Revolution would not have happened without heavy investments by the World Bank, the Rockefeller and Ford Foundations, and Asian governments in agricultural research and development, credit, input distribution, extension, and rural infrastructure. On average, Asian governments doubled their own spending on agriculture between 1972 and 1985.

1.2.4 The Rockefeller and Ford Foundations expanded International Agricultural Research Centers (IARCs) to Africa in the late 1960s—with the first center being the International Institute for Tropical Agriculture (IITA), established in Ibadan, Nigeria in 1967 to tackle technological barriers to raising food production. In the 1980s, two other centers were established in Kenya: the International Livestock Research Institute (ILRI) and the International Center Agroforestry Research (ICRAF, presently referred to as "World Agroforestry Center"); as well as a fourth center, the Africa Rice Center in Cote d'Ivoire. Of the 15 centers, four are based on the African continent. Centers in Asia and Latin America also opened research stations in Africa in the 1980s, including the Wheat and Maize Research Center in Mexico (CIMMYT) and the Tropical Crops Center (CIAT), demonstrating the increasing interest of international donors to bring the research and the technology for a green revolution to Africa.

1.3 Why technologies have not moved to scale before in Africa

1.3.1 But Africa missed the first green revolution for several reasons. Technologies have not moved to scale before in Africa due to: i) weak agricultural extension systems, ii) poor linkages between research and extension, iii) long technology verification and release systems, iv) a focus on national boundaries instead of across agro-ecological zones, v) insufficient attention to private sector value chains, vi) poor market linkages, vii) weak policy and regulatory environments, and viii) the absence of a regionally coordinated effort to deliver technologies across similar Agro-ecological zones (technologies without borders).

1.3.2 Africa's internal borders pose a serious challenge to the spread of technology on the continent. New agricultural technologies spread slowly across Africa's agro-ecological zones because they are partitioned into multiple countries with differing governments, languages, phytosanitary controls and seed-certification processes. At the same time, pests and diseases do not respect arbitrarily drawn political borders and easily spread across them. This creates a deadly mismatch between prevailing dangers and the ability to roll out technologies to stop them in their tracks. The Fall Armyworm is a good example of such a pest that travels quickly and wreaks destruction on entire crops in its path. The

Armyworm was spotted for the first time in northern Nigeria in 2016 and has already managed to spread to at least 40 African countries (see Appendix 3 for a description of the Fall Army Worm Problem and mitigation plan led by the Bank). Tragically this is a crisis with known scientific solutions in the US and Brazil to stop the pests in their path, but without mechanisms to rapidly deliver them to African fields. And this is but one example.

1.3.3 Low public sector investment in agriculture, poor seed systems, weak public extension, and lack of a harmonized regional legal framework for registration of crop varieties, and animal breeders' rights (intellectual property), have meant that even existing improved varieties and breeds do not get into the hands of most farmers within a country or across a region. The share of acreage planted using improved crop varieties is only 30% in Africa compared with more than 50% in Latin America and more than 80% in Asia. Improved livestock breeds are even less prevalent.

1.3.4 Investment by governments in the agriculture sector has also been a key driver of Green Revolutions in other regions. Mindful of this, African governments came together in 2003 to agree on the Comprehensive African Agriculture Development Program (CAADP), which, among other things, called for African countries to spend 10% of their budgets on agriculture. Yet, to date, only a handful of countries have managed to meet this target, hindering the resources available to support the transfer of new agricultural technologies into and within Africa.

1.4 Feed Africa: AfDB's Initiative to Drive Africa's Green Revolution

Feed Africa is the Bank's bold initiative to end hunger, malnutrition, extreme poverty, and food imports—currently estimated at US$35 billion and projected to rise to US$110 billion by 2025, if nothing is done. This is a massive challenge as well as a massive opportunity. *Feed Africa* takes a commodity value chain approach to developing agriculture in Africa. A guiding principle of the Feed Africa Initiative is treating agriculture as a business, rather than as a way of life, and ensuring the inclusivity of women and young people. The goal is to produce thriving small-, medium-, and large-scale agribusinesses in every segment of commodity value chains on the continent. Therefore, for *Feed Africa* to succeed, it must do two things. First, it must significantly raise agricultural productivity. Second, it must move African production much higher on the value chain, with agribusinesses producing and selling processed goods, not simply basic commodities, while providing markets for African farmers. The TAAT initiative aims to achieve the first goal, while a number of other initiatives, notably the development of agropoles and well-functioning markets, focus on the second. TAAT is therefore the bedrock of *Feed Africa.*

1.5 Technologies for African Agricultural Transformation (TAAT)

1.5.1 Similar to Asia, enhancing Africa's productivity requires significantly increased investment from African governments, businesses and development institutions to deploy proven 21st century food production technologies to tens of millions of African farmers where they will have the most impact. These food production technologies already exist and include new high yield crop and livestock varieties, micro-nutrient dense crops – for example, pro-vitamin A rich orange-fleshed sweet potato and high iron beans, drought tolerant maize varieties, integrated pest and disease management (IPDM), and simple storage and post-harvest technologies to reduce crop losses.

1.5.2 The potential of these food production technologies to provide food and nutrition security has been demonstrated and needs to be taken to scale. For example, DroughtTEGO® is a trademark for a high yielding drought-tolerant maize variety developed by the Water Efficient Maize for Africa (WEMA) Project to mitigate against drought stress. Experts predict that with global changes Sub Sharan Africa will be disproportionately affected by drought and suffer a 30% decrease in yields. Kenyan farmers who grew the WEMA varieties during the drought of 2016 obtained 3.6MT/Ha of maize compared to 1.5MT/Ha in fields of farmers who grew other commercial hybrids. In addition, it has been demonstrated that 125g of orange fleshed sweet potatoes (OFSP) can provide the daily provitamin A

needs of a preschooler. Vitamin A Deficiency (VAD) is a significant health concern in Africa contributing to high rates of blindness, disease and premature death in children and pregnant women. An estimated 43 million children under 5 years are Vitamin A deficient and between 50,000 and 125,000 of those vitamin A-deficient children go blind every year, half of them dying within 12 months of losing their sight.

1.5.3 A major target of TAAT is the control of the Fall Army Worm (FAW), a recent pest problem on the continent that currently puts at risk an estimated 13.5 million tons of maize valued at US$ 3 billion in the 2017/2018 season. This assessment is from research funded by the Department for International Development (DFID) at the Center for Agriculture and Biosciences Intenational (CABI) that assessed current and potential damage of the Fall Army Worm (FAW). Based on the aforementioned research findings, DFID requested the leadership of the African Development Bank to contain the serious problem of Fall Army Worm (FAW). Following, the Bank hosted a meeting of experts at the recent World Food Prize symposium in Des Moines, Iowa; in attendance were Center for Agriculture and Biosciences Intenational (CABI), USAID, the International Center for Improvement of Wheat and Maize (CIMMYT, the Spanish acronym), the International Center for Insect Physiology and Ecology (ICIPE), and the private sector. The meeting recommended a regional approach, awareness raising campaigns, scouting and early detection, [1]Integrated Pest and Disease Management (IPDM), and search for resistance in preferred varieties. TAAT will tackle Fall Army Worm (FAW) based on these recommendations working with CABI, ICIPIE, CIMMYT, National Agriculture Research and Extension Systems (NARES) of RMCs, regional and Sub-Regional Organizations, and R&D Centers.

1.5.4 Simple storage and post-harvest technologies being to reduce crop losses and help farmers manage the increased harvest under TAAT include: hermetic grain storage (Purdue Improved Crops Storage system) that prevent pest and mycotoxins infection of stored grains. Other post-harvest technologies include affordable and efficient grain drying, and low cost extruders for production of simple processed food by small and medium scale agribusinesses.

1.5.5 Crop campaigns to reach farmers with agricultural technologies of inputs and extension have occurred in Africa with significant success in the past. Over a four-year period, 2011-2015, Nigeria, working closely with Africa Rice, the rice CGIAR center in Africa, combined innovative (ICT-based) ways to deploy improved rice production technology of seeds and fertilizer, a value chain approach, and supportive public policies to reach 6 million rice farmers. Average yields in the country doubled from 2MT/Ha to over 4MT/Ha and national paddy rice production rose by an additional 7 million MT.

1.5.6 Similarly, in Malawi, delivery of subsidized seeds of improved maize varieties and fertilizer to millions of farmers in 2004 made the country self-sufficient in maize production and a net exporter of maize in a single season. Ethiopia's national extension system also deployed new crop technologies to over 4.4 million smallholder farmers from 2010 to 2015 on nearly 2.2 million hectares of land. Since then, Ethiopia's agriculture sector has enjoyed an average growth rate of over 7% per year, which has contributed in no small way to the double digit annual growth rate of the economy overall.

1.5.7 The approach to scaling technologies has been based on national boundaries, instead of agro-ecological zones across multiple countries. The releases of crop varieties often go through four years of testing in national contexts, which has to be replicated across countries within the same agro-ecological zone in which the same technology can make a difference. Thus, a technology that is good fit for a given agro-ecological zone of ten countries could take 40 years to reach farmers if deployment from country to country spreads one after the other. What is needed is a new approach that will cut back on these unnecessary regulatory bottlenecks and fast track the release of technologies across similar agro-ecological zones in one go. This is what TAAT will do. This will help open up the regional seed industry and markets and lead to faster uptake of technologies.

[1] [1] Integrated Pest and Disease Management (IPDM) optiones include resistant germplasm, pesticides, biopesticides, botanicals, pheromones, biocontrol via natural enemies, etc.

1.5.8. TAAT will engage Regional Technology Delivery Infrastructure (RTDI) - of CGIAR centers and other technology providers to develop a menu of proven food production technologies working with National Agricultural Research and Extension Systems (NARES), Sub-Regional Organizations (SROs) and the Forum for Agricultural Research in Africa (FARA), the umbrella body of NARES in Africa. Based on the menu of proven food production technologies, RMCs, as represented by NARES, will work with the CGIAR centers to prepare proposals for food technology outreach campaigns across similar agro-ecological zones that cut across multiple countries to the decision making body of the RTDI, the Clearinghouse (see details in ***Appendix 1***). There are eight Priority Intervention Areas (PIA) of TAAT that are agro-ecology based and cover 18 priority commodities (see ***Appendix 2***). But for this phase, nine food production technologies have been prioritized because of potential impact to increase food security, combat malnutrition, reduce food imports, and improve livelihoods. They include: Water Efficient Maize for Africa (WEMA), high yielding rice varieties adapted to Africa (the NERICA varieties), high-yielding and high-starch cassava varieties, high yielding sorghum and millet for the Sahel, orange fleshed sweet potatoes, high iron beans, small livestock (goat and sheep), aquaculture, and new wheat varieties. Control of pests and diseases, for example the Fall Army Worm (FAW), is a cross cutting intervention across all nine technologies.

1.5.9 While TAAT is not a research program to develop new technologies—for the most part the needed technologies already exist and in some cases are already in use—but rather a crop and livestock outreach campaign to disseminate best-bet crop varieties/livestock breeds and practices to the farmers, it requires a close partnership with National Agricultural Research and Extension Systems (NARES) and International R&D Centers to provide solutions that tend to arise as research is deployed over a wide range of similar but diverse agro-ecologies with unique micro-ecosystems.

1.6 TAAT will carry out positive gender discrimination in favor of women

1.6.1 A successful green revolution must be inclusive and based on a recognition that Africa's agricultural transformation and women's empowerment are inextricably linked. Addressing the gender disparities that persist in African agriculture presents a tremendous opportunity to unlock the potential of African agriculture with the World Bank cautioning that "failure to recognise the different roles of men and women in agriculture is costly, resulting in misguided projects and programmes, forgone agricultural output and incomes, and food and nutrition insecurity". Indeed incorporating consideration for gender issues systematically in agricultural research, development, and extension systems will contribute significantly to meeting the food needs of Africa's growing population and ensure that productivity gains in food systems translate to improved welfare of the poor.

1.6.2 Women are important to Africa's agriculture and agriculture is important to African women's lives. The agricultural sector is the largest employer of African women, with 62% of economically active women working in the sector. In countries such as Rwanda, Malawi and Burkina Faso, over 90% of economically active women are involved in agricultural activities. Despite being heavily engaged in agriculture, African women earn less than men from the sector with the rural wage gap between men and women estimated at between 15-60%. In the case of Ivorian cocoa and Ethiopian coffee, for example, women provide 68% and 75% of the labour, respectively, but earn only earn 21% and 34% of the income generated.

1.6.3 Research indicates that, when granted equal access to inputs and skills, women farmers are just as efficient as male farmers. Hence the privileging of male farmers, for example in Ivorian rice projects, is based on erroneous assumptions not supported by data. As such, gender responsiveness in agricultural research and development is not about 'fixing the women farmers', but rather addressing the institutional structures and technological impediments that hamper their productivity. Ultimately, the empowerment of women farmers requires institutional transformation, with research institutions becoming more gender responsive and paying close attention and genuinely responding to the needs of women farmers

1.6.4 In partnership with African Women in Agricultural Research and Development (AWARD), the Bank will systematically incorporate consideration for gender equality and ensure women's equal access to agricultural technologies. In this regard, AWARD will support TAAT by: (i) Convening and coordinating a network of technical gender experts that would be available to members of the TAAT consortium to address issues of gender in the selected value chains which will maximize the impact of TAAT by providing consolidated gender expertise and opportunity for shared learning; (ii) Identifying and prequalifying bankable and scalable agricultural research and development innovations that address the gender gap in African agriculture and build relationships with private sector and other uptakers of gender responsive agricultural technologies. Expected outcomes will be demonstrated change in in gender awareness, attitudes and/or behaviours of TAAT partners, a measurable increase in TAAT partner institutions with gender responsive agricultural innovation policies and strategies, and TAAT outputs that are gender responsive across value chains.

1.7 Expected Impact of TAAT

1.7.1. TAAT interventions are projected to raise productivity and increase food production over the next 8-10 years (Table 2). TAAT will add an estimated 120 million MT of food to Africa's food production valued at US$1.71 to US$2.8 billion (Table 2).

Table 2: Impact on Productivity, Production, and Livelihood of TAAT

Commodity	**Productivity baseline (2016) (MT/Ha)**	**Productivity 2025 (MT/Ha) (**mean**)**	**Production (MT)**
Maize	2	4	30 million
Lowland Rice	2	4	15 million
Wheat	1.5	3	25 million
Sorghum	1	2	10 million
Millet	1	2	5 million
Cassava	12	20	20 million
Small livestock (live weight at 12 months)	25 Kg	50 Kg	10 million
Fish (live weight at 6 months)	3 Kg	5 Kg	5 million

1.7.2 TAAT will benefit, through improved food security and income, an estimated 11.7 million households (representing on average 40 million people) over ten years, reducing by as many as a third the total number of hungry people on the continent. The increased food production is also expected to have an effect on food prices, reducing the amount of food households spend on food, and further increasing access to more food. It is estimated that TAAT, including its Bank-financed Country programs, combined with the affiliated programs of the World Bank and AGRA, will contribute to lifting about 40 million people out of poverty.

1.7.3 TAAT will help to create huge regional spill-over effects and Regional Public Goods (RPGs). Of particular importance are RPGs that target imminent "regional public threats" of destructive pests and diseases of crops/livestock that do not respect political borders and easily spread across them. A good example is the recent invasion into Africa of the Fall Armyworm described above, which currently puts at risk an estimated 13.5 million tons of maize valued at US$ 3 billion in the 2017/2018 season.

1.8 TAAT is a Regional Program Producing Regional Public Goods (RPGs)

1.8.1 TAAT resources are targeted at facilitating effective functioning of the Regional Technology Delivery Infrastructure (RTDI), made up of International Agriculture Research Centers of the Consultative Group on International Agricultural Research (CGIAR), National Agricultural Research and Extension Systems (NARES), African Agricultural Technology Foundation (AATF), Sub-Regional Organizations, all non-governmental organizations, that will ensure that proven agricultural development technologies are rapidly deployed to RMCs.

1.8.2 TAAT aims at producing Regional Public Goods (RPGs), including: i) harmonized regional and Transnational border protocols for introduction and release of improved varieties/breed and other agricultural technologies, ii) Synchronization of seed system protocols, especially those that deal with liberalization of foundation seed production (to include private sector seed companies), iii) combatting "regional public threats" of destructive pests and diseases of crops/livestock that do not respect political borders and easily spread across them.

1.8.3 The requested grant from the RPG window of ADF 14 will support CGIAR and low-income RMCs to drive delivery of food productions technologies into hands of at least 60% of all farmers after eight to ten years. Twenty two of these RMCs, namely: Benin, Burkina-Faso, Cameroon, Chad, Congo DRC, Ethiopia, Gambia, Ghana, Guinea-Bissau, Kenya, Malawi, Mali, Mauritania, Niger, Nigeria, Rwanda, Senegal, Sierra Leone, Sudan, Tanzania, Uganda, and Zambia have written to the Bank to express interest in participating. Six of them (Chad, Congo DRC, Guinea-Bissau, Mali, Sierra Leone, and Sudan) are in fragile situations as defined by the eligibility for the Transition Support Facility (TSF) support under ADF-14. However, it should be noted that TAAT will produce Regional Public Goods (RPGs) of public interest; no RMC can be excluded from it or from their spillover benefits, given their public goods characteristics (see section 4.2 and ***Appendix 4***). TAAT is therefore not exclusive to low-income ADF RMCs. Non-ADF countries interested in TAAT such as Egypt, Morocco, and Tunisia (ADB countries that have written to express interest in TAAT) are welcome to participate via the ADB funding window of the Bank or other eligible partner funds (e.g., funds from BMGF and World Bank). Participation will simply depend on the ability of RMCs to meet requirements for technology deployment. For the 25 countries (22 ADF and 3 ADB) that have expressed interest in participating in TAAT, the country programs in the pipeline that are aligned to inserting a TAAT component are listed in ***Appendix 5***. TAAT is therefore open to all RMCs, via their NARES, to make their best technologies accessible to farmers within countries working in close collaboration with regional and continental organizations. The new crop varieties and livestock breeds, cross-boundary crop and livestock diseases control (e.g., Fall Armyworm), crop management practices, knowledge and other products from the CGIAR's research work are indeed RPGs made widely available to individuals and organizations working for sustainable agricultural development around the world. TAAT will be held to high standards of deployment and must meet clear key performance indicators or funding will be discontinued to erring institutions.

1.9 TAAT will benefit from the lessons learned from previous Bank interventions

1.9.1 The Bank's earlier experience with the "Support to Agricultural Research for Development of Strategic Crops in Africa" (SARD-SC) program – which funded research on four of the six strategic crops of the African Union (Cassava, Maize, Rice and Wheat) – provides crucial lessons that TAAT will build upon. They include: i) experience on how to work regionally with international centers of excellence (the CGIAR) to rapidly introduce and test technologies across a region for optimal yields and eventual deployment to farmers; ii) The SARD-SC program revealed the importance of going to scale to ramp up food production and reduce imports. TheSARD-SC program led to a doubling of yields for wheat, rice, maize, cassava on experimental fields and in on-farm trials; if average wheat yields increases from 1.5 to 3MT/Ha and higher tons per hectare could be replicated across 9.8 million hectares grown in Africa, the continent could be on the path to self-sufficiency in wheat production; iii) SARD-SC also demonstrated the advantages of working across multiple countries with similar agriculture-ecological zones, simultaneously introducing, testing and releasing new crop varieties in several countries at the same time. Other lessons are have been learned from the development of the NERICA (New Rice for Africa) rice varieties by AfricaRice in the 1990s (***Appendix 6***).

1.10 The Value-Added of TAAT

1.10.1 The value-added of TAAT is that it can leverage crop and livestock technologies that have been developed and validated in one or a few countries across entire agro-ecological zones covering many countries. For example, maize yields can be doubled across East and Southern Africa via an

introduction, registration, and deployment of already available drought tolerant Water Efficient Maize for Africa (WEMA) varieties. And perhaps the best demonstration of the value added of TAAT is in tackling pests and diseases such as Fall Armyworm accross an entire region.

1.10.2 TAAT will allow donors to work together through a well-coordinated regional technology delivery platform, for appropriate technologies to be deployed to millions of farmers across Agro-ecological zones. It will bring to bear the joint collective effort of international, regional and national agricultural systems to improve connections between research and extension and reform regulatory systems that impede the speedy transfer of technologies across borders.

2 PROGRAM DESCRIPTION

2.1 Objectives of TAAT

The development objective of TAAT is to "rapidly expand access of smallholder farmers, majority women, to high yielding agricultural technologies to improve their food production, assure food security and raise rural incomes, and deliver regional public goods by scaling up agricultural technologies across similar agro-ecological zones". Overall TAAT has three main objectives:

i) Creating an enabling environment for technology adoption by famers via policies for deployment and adoption of food production technologies that are regionally harmonized, food and nutrition conscious, and environmentally sustainable;

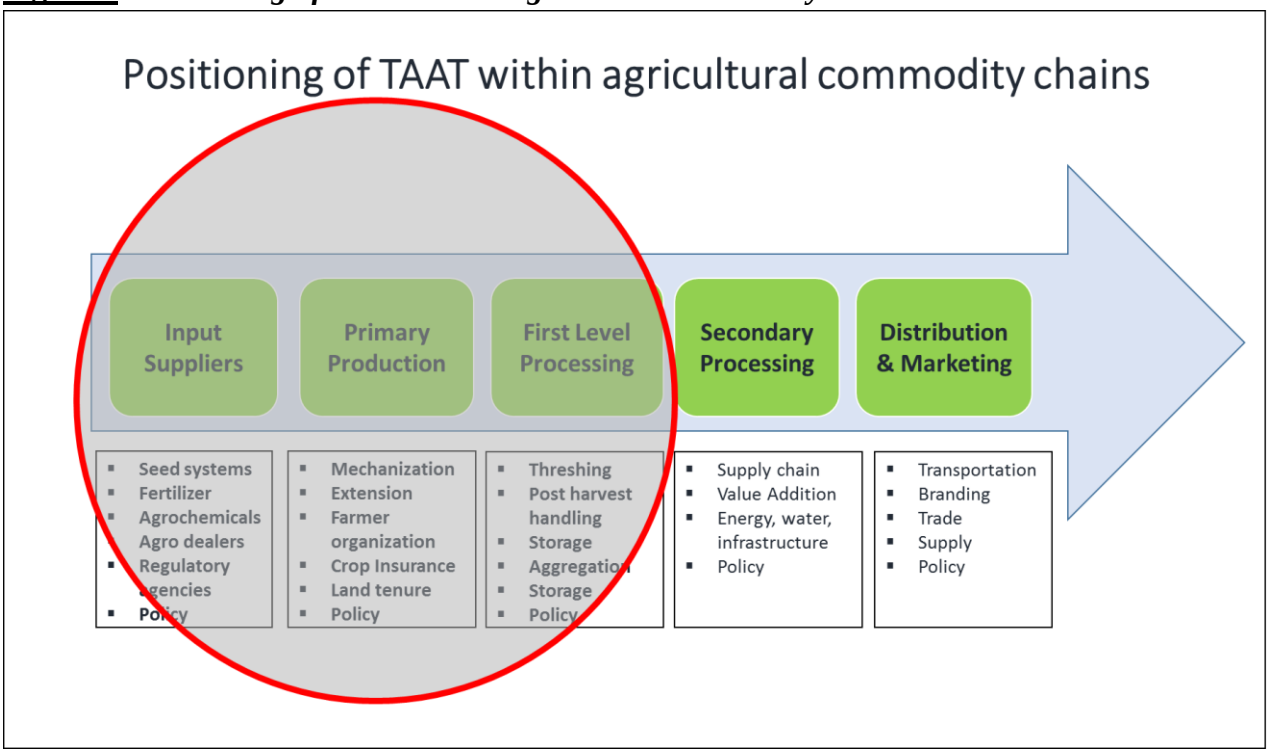
ii) Facilitate effective delivery of technologies to farmers by working with existing Regional Technology Delivery Infrastructure in a compact with RMCs, represented by NARES, private sector actors, and an independent technology Clearinghouse;

iii) Raising agricultural production and productivity through the identification and deployment of appropriate technologies, including nutrient dense crop varieties, and vigorous crop outreach campaigns, extension, and market linkage campaigns, in RMCs.

2.2 Strategy of TAAT

2.2.1 Feed Africa takes a value chain approach to raising crop/livestock productivity in Africa. Figure 1 shows where TAAT will intervene in the commodity value chains. A commodity value chain is described as a series of goods and services required for a commodity to be produced and then to move from the place of its primary production to the ultimate end-user (Figure 1).

Figure 1: ***Positioning of TAAT within agricultural commodity value chains***



2.2.2 Agricultural growth that has occurred in Africa reveals that productivity enhancement and market access development are prevalent factors. Productivity unaccompanied by strong growth in markets leads to a glut from over-production, while markets without increased productivity gives rise to food imports due to insufficient supply. Feed Africa will work to reinforce these productivity aspects of the value chain and agriculture markets through its various initiatives such as TAAT, Agropoles, post-harvest losses and agro processing. The role of TAAT in particular is to improve outcomes at the beginning of this chain by increasing productivity, as well as resilience to weather and disease-related risks, providing a much more solid basis from which to build strong production systems and markets that make African agribusinesses successful. TAAT will work in concert with the other initiatives to foster the deployment of commercially viable technologies with improved access to input and output markets, and other enablers such as innovative finance and soft/hard infrastructure.

2.2.3 It is important for TAAT to generate 'quick wins' to create credibility and attract both additional public and private sector financing. An initial set of priority agricultural commodities are:

i) Water Efficient Maize for Africa (WEMA),

ii) Import-quality rice for the west African lowlands,

iii) Cassava for industrial use,

iv) Small livestock (goats and sheep),

v) Sorghum/millet for the Sahel,

vi) Aquaculture

vii) High yielding wheat varieties

viii) Orange fleshed Vitamin A rich sweet potato varieties

ix) High iron beans varieties for Africa

Management of pests and disease is a cross cutting theme across all the nine technologies

2.2.4 Clear metrics of target productivity, production, beneficiaries, agro-ecologies, and countries have been pre-determined for these nine priority food production technologies (See ***Appendix 7***)

2.3 TAAT Activities

2.3.1 The TAAT program consists of four major components namely:

i) **Component #1:** Creation of an enabling environment for technology adoption by famers via a seed system, technology release and registration policies that are regionally harmonized

ii) **Component #2:** A Regional Technology Delivery Infrastructure (RTDI)—or TAAT platform—that is able to provide and deploy needed food production technologies and any additional adaptive research required

iii) **Component #3:** Deployment of appropriate food production technologies, through crop/livestock campaigns in RMCs

iv) **Component #4:** Project Management.

2.3.2 Harmonization of technology release and registration, and seed system, policies across regions

The approach to scaling technologies based on national boundaries needs to be replaced by an approach that involves agro-ecological zones that spread across multiple countries. Policies and protocols for release and registration of crop varieties and animal breeds needs to be streamlined so that varieties/breeds released in one country can be utilized in other countries of the same region, same with seed system protocols that can replicated across countries within the same agro-ecological zone. TAAT, working with Sub-Regional Organizations (SROs) and CGIAR center responsible for policy work, IFPRI (and its key partners such as the Africa Technology Policy Studies ATPS Network), will review national and regional policies on variety release, registration, and the seed system with an aim of harmonizing them to fast track the release of technologies across similar agro-ecological zones. This will help open up the regional seed industry and markets and lead to faster uptake of technologies.

2.3.3. The Regional Technology Delivery Infrastructure (RTDI)—or TAAT platform

RTDI is a consortium of CGIAR centers, FARA, Africa Agricultural Technology Foundation (AATF) and SROs working on regional approaches to deployment of new crop and livestock technologies, and combatting pest and disease threats through a fair and transparent method in prioritizing technologies and allocating resources. The RTDI will develop a menu of food production technologies and work with RMCs, as represented by NARES and the private sector, to develop a proposal to take these technologies to scale. Figure 2 schematically describes the RTDI processes. The RTDI is made up of four units, namely:

1. **A Project Steering Committee (PSC)**: the highest decision-making body composed of representatives of participating RMCs, the private sector, CGIAR centers. The committee provides oversight to Regional Technology Delivery Infrastructure (RTDI).

2. **Clearinghouse:** the body of the consortium that decides on which technologies should be used. The Clearinghouse will be independent of the Project Management Unit (PMU);

3. **Commodity Technology Delivery Compact (CTDC):** is at the core of TAAT and it is an agreement among the entire ecosystem of actors needed to deliver improved

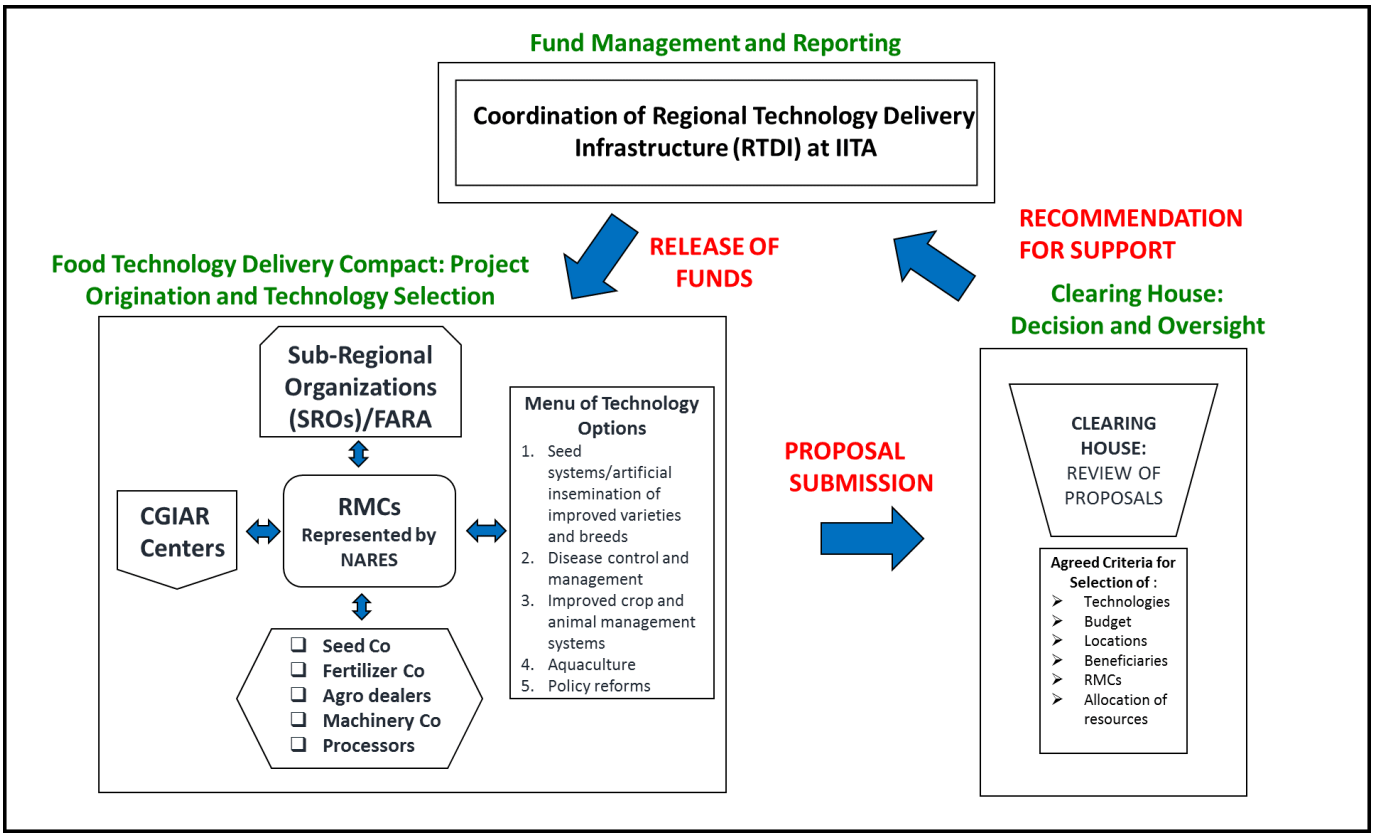
technologies at scale for a specific crop or livestock value chain, for each of the priority commodities. They will be hosted the CGIAR center or institution with the particular mandate for each specific crop;

4. **A Project Management Unit:** oversees day-to-day implementation of project fiduciary and administrative activities;

2.3.4 Identification and deployment of appropriate technologies, through crop/livestock campaigns in RMCs

TAAT will engage CGIAR and other technology providers to develop a menu of proven food production technologies, namely: seed system or artificial insemination guidelines (technical manuals) for large scale deployment of improved varieties/breeds, disease control, improved crop/animal production methods, aquaculture, etc. RMCs, as represented by NARES, will prepare a proposed food technology outreach campaign covering one or more of the menu items, with support from the respective CTDC for submission to the Clearinghouse of the RTDI. The proposals will clearly state the target beneficiaries, location, development impact, and timelines within the RMCs. The Clearinghouse will review the proposals according to a set of agreed criteria and recommendations for funding. Oversight will also be provided for implementation by the Clearing house.

Figure 2: ***Process of origination, review, decision making, and funding in the Regional Technology Delivery Infrastructure***



2.4 Expected Output and Outcomes

2.4.1 Expected Outputs

TAAT interventions are projected to raise productivity of target commodity up to 100% over the next 8-10 years (Table 2). Other outputs include reduction of Vitamin A deficiency in children under five and pregnant women by 30% and reduction in post-harvest losses by 50% in target locations of TAAT over the next 8-10 years.

2.4.2 **Provision of Regional Public Goods (RPG)**

Regional public goods will be provided via a number of vehicles including:

i) Harmonization of regional and transnational border protocols for introduction and release of improved varieties/breed and other agricultural technologies

ii) Synchronization of seed system protocols, especially those that deal with production of foundation seeds (inclusion of private sector seed companies)

iii) Disease control – monitoring and IPDM methods

iv) Extensive adaptation trials of crop varieties across the region, including nutrient dense varieties

2.4.3 **Crop Outreach Campaigns to reach millions of African Farmers**

i) Toolkits for the different priority commodities provided to the RMCs

ii) Feedback on performance of technologies via the RTDIs

iii) A doubling of acreage under improved crops and breeds, from the current 30% to 60%, by 2025

iv) Availability of cheap and nutritious food

2.4.4 **Expected Outcomes**

TAAT will benefit via increased food security and income, raising farmer's household incomes by an average of US$600 per annum, reaching an estimated 11.7 million households, representing on average 40 million people, over ten years, and reducing by as much as a third the total number of hungry people on the continent. TAAT will add an estimated 120 million MT of food to Africa's food production valued at US$1.71 to US$2.8 billion (Table 2). The increased food production will also have an effect on food prices, reducing the amount households spend on food, and further increasing access to more food, in a positive feedback loop. TAAT is expected to add 3.15 million direct farm jobs over eight years.

2.5 Costs and Financing Arrangements

2.5.1 **Program Cost**

TAAT is divided into centrally managed activities, designed to produce regional public goods, and funded by grants from the Bank and partners, and country program activities to be financed through sovereign loans from the Bank and partners. The UA 29 million from the ADF XIV Regional Public Goods (RPGs) window will solely finance regional public goods described in the TAAT Program Framework Document. BMGF has already approved $1.14 million and AGRA is processing a $10 million grant for centrally managed activities of TAAT. The country programs will be financed via AfDB sovereign loans to RMCs, as well as World Bank loans to RMCs to the tune of USD 700 million. **The Bank's financing of the central programs will be for nine priority commodities using resources from ADF XIV RPG window**. This first set of commodities will be implemented over three (3) years (2018 to 2020). **Only activities of the first nine commodities have been described in more detail in the present report,** with the costing information below.

2.5.2 **The total cost of first phase of TAAT is estimated at UA 40.00 million (USD 56.532 million) net of taxes and based on 2016 prices comprising UA 15.27 million or 38% in local costs and UA 24.73 million or 62% in foreign costs**. This cost is inclusive of physical and price contingencies estimated at average rates of 3% and 5%, respectively. The physical contingencies are estimated from 0% (emolument) to 5% (works) based on common practices. The price contingencies were estimated on the basis of actual and projected levels of local inflation rates of about 2% per annum and foreign inflation rates.

2.5.3 **The summary of the first phase of nine commodities costs by component and by category of expenditure** are presented respectively in Tables 3-4.

Table 3: Summary of Program Cost by Components

COMPONENTS	(USD '000)			(UA '000)			%	%
	Local	Foreign	Total	Local	Foreign	Total	FE	BC
1. CREATION OF ENABLING ENVIRON. FOR TECHNOLOGY ADOPTION	6 049.38	9 800.52	15 849.90	4 280.32	6 934.49	11 214.82	62	30
2. REGIONAL TECHNOLOGY DELIVERY INFRASTRUCTURE (RTDI)	4 900.26	8 043.82	12 944.09	3 467.25	5 691.52	9 158.77	62	25
3. DEPLOYMENT OF APPROPRIATE TECHNOLOGY (DAT)	7 528.70	13 604.50	21 133.20	5 327.04	9 626.05	14 953.09	64	40
4. PROGRAM MANAGEMENT	1 771.93	777.78	2 549.70	1 253.75	550.33	1 804.08	31	5
Total BASELINE COSTS	**20 250.27**	**32 226.62**	**52 476.89**	**14 328.36**	**22 802.39**	**37 130.75**	**61**	**100**
Physical Contingencies	954.01	1 608.79	2 562.79	675.02	1 138.32	1 813.34	63	5
Price Contingencies	379.90	1 112.42	1 492.32	268.80	787.11	1 055.91	75	3
Total PROJECT COSTS	**21 584.17**	**34 947.83**	**56 532.00**	**15 272.18**	**24 727.82**	**40 000.00**	**62**	

Table 4: Summary of Program Cost by Category of Expenditure

EXPENDITURES CATEGORIES	(USD '000)			(UA '000)			%	%
	Local	Foreign	Total	Local	Foreign	Total	FE	BC
I. Investment Costs	**18 834,77**	**32 027,12**	**50 861,89**	**13 326,80**	**22 661,23**	**35 988,03**	**63**	**97**
A. GOODS	**25,25**	**84,75**	**110,00**	**17,87**	**59,97**	**77,83**	**77**	**-**
Vehicles	9,00	36,00	45,00	6,37	25,47	31,84	80	-
Equipment & Inputs	16,25	48,75	65,00	11,50	34,49	45,99	75	-
B. SERVICES	**17 211,32**	**30 634,75**	**47 846,07**	**12 178,11**	**21 676,04**	**33 854,15**	**64**	**91**
Training	5 138,97	6 280,96	11 419,93	3 636,15	4 444,18	8 080,33	55	22
Studies	1 861,58	5 584,74	7 446,32	1 317,19	3 951,56	5 268,75	75	14
Contractual Services	9 905,52	18 395,97	28 301,49	7 008,79	13 016,32	20 025,11	65	54
Audit	305,25	373,08	678,33	215,98	263,98	479,96	55	1
C. MISCELLANEOUS	**1 598,20**	**1 307,62**	**2 905,82**	**1 130,83**	**925,22**	**2 056,05**	**45**	**6**
II. Recurrent Costs	**1 415,50**	**199,50**	**1 615,00**	**1 001,56**	**141,16**	**1 142,72**	**12**	**3**
A. PERSONEL	1 155,00	-	1 155,00	817,24	-	817,24	-	2
B.DAILY SUBS. ALLOWANCES (DSA)	120,00	-	120,00	84,91	-	84,91	-	-
C. OPERATION AND MAINTENANCE	100,00	150,00	250,00	70,76	106,13	176,89	60	-
Vehicles	60,00	90,00	150,00	42,45	63,68	106,13	60	-
Equipment	40,00	60,00	100,00	28,30	42,45	70,76	60	-
D. GENERAL OPERATING CHARGES	40,50	49,50	90,00	28,66	35,02	63,68	55	-
Total BASELINE COSTS	**20 250,27**	**32 226,62**	**52 476,89**	**14 328,36**	**22 802,39**	**37 130,75**	**61**	**100**
Physical Contingencies	954,01	1 608,79	2 562,79	675,02	1 138,32	1 813,34	63	5
Price Contingencies	379,90	1 112,42	1 492,32	268,80	787,11	1 055,91	75	3
Total PROJECT COSTS	**21 584,17**	**34 947,83**	**56 532,00**	**15 272,18**	**24 727,82**	**40 000,00**	**62**	

2.6 Program financing arrangements

2.6.1 Of the total first phase Project cost of UA 40 million (USD 56.532 million), Bank Financing will be UA 29 million or USD 40 million (72.5%) (See Tables 5 and 6). This will finance 100% of Goods; 100% of services for the Commodity Technology Delivery Compact (CTDC); 100% funding

for Enable Youth in TAAT (ENABLE-TAAT) and 100% operating costs. Bill and Melinda Gates Foundation (BMGF) will provide UA 0.83 million ((USD 1.138 million) or 2.1 %) to assist the establishment of the Clearing house. The funding from BMGF will cover recruitment of key staff and other operating expenses. The Clearinghouse will play a major role in the TAAT implementation. The Alliance for a Green Revolution in Africa (AGRA) will provide UA 7.25 million (or USD 10 million) to finance 100% services (across Components 1, 2, and 3). The participating RMCs will contribute UA2.90 million (7.3%) in local currency, 100% in-kind, by provision of farm land for extension training facilities, demonstration activities, and other critical RPGs-promoting activities. Project beneficiaries include a variety of stakeholders: agripreneurs, farmer based organizations and cooperatives, commodity processors, private sector operators, registered SMEs, seeds producers, agro-input dealers, service providers, millers, aggregator and market operators, and young graduates.

2.6.2 While table 5 below indicates the financing arrangements by local and foreign currency distribution, table 6 indicates financing by year. Grants' allocations by source and expenditure categories is presented in ***Appendix 8a*** and by components in ***Appendix 8b***

Table 5: Financing arrangements by Local & Foreign Distribution

FINANCING SOURCES	Financing (USD '000)			Financing (UA '000)			%
	Local	Foreign	Total	Local	Foreign	Total	
ADF Grant	12 894,72	28 090,97	40 985,70	9 123,84	19 876,16	29 000,00	72,5
AGRA	4 058,45	6 187,97	10 246,43	2 871,61	4 378,39	7 250,00	18,1
BMGF	532,43	668,88	1 201,30	376,73	473,27	850,00	2,1
Government	4 098,57	0,00	4 098,57	2 900,00	0,00	2 900,00	7,3
Total Financing	**21 584,17**	**34 947,83**	**56 532,00**	**15 272,18**	**24 727,82**	**40 000,00**	**100,0**

NB: Government contribution is 7.3% and in-kind (national staff salaries, part of the operating cost, rental value of the office space offered, laboratory infrastructure and experimental land and the loss in fiscal receipts due to tax and custom duty exemption of different project procurement). It is less than 10% required because six (6) of the target 22 low-income RMCs are countries are in fragile situations and conflict-affected (see related Annex in Vol. II of the Report, Technical Annex)..

Table 6: Financing arrangements by Year

FINANCING SOURCES	Financing (USD '000)				Financing (UA '000)			
	2018	2019	2020	Total	2018	2019	2020	Total
ADF Grant	25 862,19	10 008,30	5 115,21	40 985,70	18 299,15	7 081,51	3 619,34	29 000,00
AGRA	5 059,20	3 435,51	1 751,71	10 246,43	3 579,71	2 430,84	1 239,45	7 250,00
BMGF	-	593,01	608,29	1 201,30	-	419,59	430,41	850,00
Government	2 727,48	676,36	694,73	4 098,57	1 929,87	478,57	491,57	2 900,00
Total Financing	**33 648,88**	**14 713,18**	**8 169,94**	**56 532,00**	**23 808,73**	**10 410,51**	**5 780,76**	**40 000,00**

2.6.3 During the implementation period for each component, expenditures will be carried out according to the schedule in Table 7. The nine priority commodity value chain activities will be implemented during the first two years through a comprehensive deployment of new technologies in RMCs. Year 3 will be dedicated to the consolidation of the results through mainstreaming of the value chain development activities on a commercial basis

Table 7: Expenditure Schedule by Component (USD and UA Million)

COMPONENTS	(USD '000)				(UA '000)			
	2018	2019	2020	Total	2018	2019	2020	Total
1. CREATION OF AN ENABLING ENVIRONMENT FOR TECHNOLOGY ADOPTION	4 498,30	6 346,72	6 515,11	17 360,14	3 182,83	4 490,71	4 609,86	12 283,41
2. REGIONAL TECHNOLOGY DELIVERY INFRASTRUCTURE (RTDI)	10 679,31	2 313,01	889,80	13 882,13	7 556,30	1 636,60	629,59	9 822,49
3. DEPLOYMENT OF APPROPRIATE TECHNOLOGY (DAT)	17 430,36	5 194,06	-	22 624,42	12 333,09	3 675,13	-	16 008,22
4. PROGRAM MANAGEMENT	1 040,90	859,38	765,03	2 665,31	736,51	608,07	541,31	1 885,88
Total PROJECT COSTS	**33 648,88**	**14 713,18**	**8 169,94**	**56 532,00**	**23 808,73**	**10 410,51**	**5 780,76**	**40 000,00**

2.7 Key Performance Indicators

The TAAT first phase commodities performance indicators are outlined in the Results Based Logical Framework at three levels: Impact, Outcome and Output.

- *The impact indicators* relate to more food secure population and dealing with the prevalence of stunting among children under 5 years.
- *The outcome indicators* are household income, agricultural productivity, job creation, tons of additional food commodity, household dietary diversity, value of additional foods produced, and number of beneficiaries.
- *The output indicators* include: technology policies harmonized across regions/countries, weak systems strengthened, improved crop varieties and livestock breeds widely applied, technology adoption constraints removed, promotional activities with a focus on technologies for safe and nutritious foods, and communities with better access to inputs and output markets. Others are best-bet technologies scaled out, campaigns implemented, delivery platforms convened, agripreneurs supported, M&Es of platforms carried out, trans-national pests and diseases facilitated, technologies identified and deployed, menus of proven food production technologies developed, and wide-scale farm extension models implemented.
- See the RBLF for complete list.

3 FEASIBILITY OF TAAT

3.1 Economic and Financial Performance

3.1.1 It is anticipated that the Bank's intervention will result in positive economic and financial impacts in RMCs from the nine priority technologies, especially given the public goods nature of the interventions. Economic and financial analyses were carried out using the economic surplus approach for the nine selected commodities. Improvements taken into account were streamlined and harmonized release of improved crop varieties and livestock breeds, strengthening of seed systems, use of improved varieties of crops across the applicable agro-ecological zones, design and implementation of appropriate campaigns for trans-national control of pest and diseases, good agricultural practices (GAPs), capacity building and outreach, policy support and advisory services, as well as demonstration and promotional activities. The benefits were measured based on increase in food supply as a result of improved access to proven technologies and other farm inputs. The annual flows of gross economic benefits from

increased crop and livestock productivity, production and value chains were estimated and aggregated. The aggregate benefits and costs (per commodity value chain) were then discounted to derive the estimated present value (in 2017 values) of total net benefits from the intervention. The benefits and costs were later aggregated across the nine priority commodities to calculate the aggregate financial and economic impacts.

3.1.2 **The consolidated Net Present Value (NPV) of the Financial Net Benefits was US$ 431.5 million with an internal rate of return (FIRR) of 27%**. Using World Prices (to correct for domestic distortions, taxes, and subsidies), the NPV of net economic benefits was calculated at US$ 280 million with an internal rate of return of 23%. The result is quite robust and includes changes in productivity (crop and livestock), levels of adoption of proven agricultural technologies, and discount rates. For instance, a scenario of adoption by 10% of farmers, 10% productivity increase, and 10% discount rate across the nine priority commodities still gave an aggregate NPV of US$ 296 million with an internal rate of return of 18%. This supports the potential economic impact of the TAAT approach.

3.2 Environmental and Social impacts and Gender

3.2.1 TAAT has been classified as Category 2 operation, indicating that the program activities are expected to have limited adverse environmental and social impacts. An Environmental and Social Management Framework (ESMF) for the mitigation of adverse environment and social impacts of the program was posted on the Bank's website on 4 July 2017. It provides the processes and methodologies to be implemented by the Clearinghouse/PMU to screen and manage potential environmental and social impacts and risks likely to result from the proposed agriculture technologies and demonstration activities. Because TAAT will be executed at RMCs, the ESMF draws on applicable national and regional regulatory frameworks as well as international good practice guiding environmental and social management.

3.2.2 Women's large overrepresentation in agricultural tasks in Africa, combined with the existence of a gender gap in agricultural productivity and the need to boost Africa's agricultural output calls for increased attention to raising female agricultural productivity. The technologies it invests in must respond to the needs and priorities of women as well as men in order to level the playing field and increase agricultural productivity. Implementing partners must emphasize the deployment of gender-responsive technologies. There is a strong case within TAAT for carrying out positive gender discrimination, since women form the majority of farmers as well as food processors in Africa. Studies have shown that women are as efficient as men, given access to same technologies. A World Bank publication (2008) clearly documents gender based differences in African agriculture and in terms of technology, land, extension, finance, time, mobility and education and training.

3.2.3 TAAT will ensure the gender responsiveness of the technologies. Evidence shows that introducing new agricultural technologies can exacerbate already existing gender disparities and make life tougher for smallholder farmers, especially women and girls. However, with proper attention, agricultural technologies have the potential to bridge the gender gap and lead to inclusive, agriculture-driven prosperity for all Africans. The African Women in Agricultural Research and Development (AWARD) will be one of the partners for the TAAT program to not only build the capacity of key Bank staff and TAAT implementers to be more gender responsive, it will help mitigate potential negative gender impacts while upscaling those technologies that bridge Africa's gender gap in agriculture. The TAAT program recognizes that gender equality in agribusinesses is a priority. The mechanisms to ensure social inclusion and gender equality in this project include appropriate outreach strategy and gender sensitive training on good agricultural practises, as well as adequate provisions for both genders to access affordable and quality agricultural technologies and input and output markets. In addition, this project will prioritize the adoption of gender friendly technologies and support policies in the target countries.

4 IMPLEMENTATION

4.1 Implementation Arrangements

4.1.1 Structure and Activities of the RTDI (TAAT Platform)

The structure of the Regional Technology Delivery Infrastructure (RTDI) consists of the Project Steering Committee (PSC), the Clearing House, the Commodity Technology Delivery Compact (CTDC), and the Project Management Unit (PMU). These component are described in more details below.

4.1.2 Project Steering Committee (PSC)

The Project Steering Committee is the highest decision-making body composed of representatives of AfDB, African Ministers of Agriculture of participating RMCs, the various CG Centers, the Private sector, NARES and regional farmer organizations. The committee provides oversight functions to Regional Technology Delivery Infrastructure (RTDI). All annual work programs will be cleared by the PSC prior to funding. Membership of the Program Steering Committee (PSC) will be approved by the Bank.

4.1.3 Clearinghouse

The Clearinghouse is the main decision making body of the RDTI when it comes to selecting which technologies to disseminate and scale up. It will be substantially autonomous; its work plan and budget will be approved by the Program Steering Committee (PSC). The objective of the Clearinghouse is to decide which proven agricultural technologies proposed by each Crop/Livestock compact group can be rolled out and taken to scale. The activities of the Clearinghouse are indicated in ***Appendix 1***.

The activities of the Clearinghouse include:

i) Evaluating requests from the compacts for technologies to be rolled out and scaled up. This will be akin to a peer review mechanism of the proposed technologies;

ii) Validating the design and plan with stakeholders for a buy-in and commitment;

iii) Identifying the optimal mix of partners that will accompany the implementation, backstopping and monitoring of the proposed plan;

iv) In collaboration with the RMCs, conduct monitoring and assessment of milestones and Performance Indicators;

v) In collaboration with the Bank, advising Governments and private actors on investment opportunities and financing mechanisms for going to scale.

4.1.3.1. Although the Clearinghouse will be based at the IITA sub-station in Cotonou it will be fully independent of the IITA management. It is not a part of the PMU and will operate as an independent unit with its own competitively recruited Director, supported by technical and support staff. The key skills assets required in the Clearinghouse include: i) technology transfer specialist; ii) an outreach expert; iii) a communication expert; iv) a gender development specialist, and v) M&E Specialist in addition to other general services staff.

4.1.4 Crop/Livestock Technology Delivery Compacts

At the heart of TAAT's technology deployment effort is the Crop/Livestock Technology Delivery Compact (CTDC). CTDC is an agreement between the CGIAR center with mandate for the commodity

value chain, NARES, the RMCs and the entire ecosystem of value chain actors—from input supplier, processors, aggregators, equipment manufacturers, extension agencies, etc. The CTDC drives the implementation of TAAT activities for each of the nine priority commodities. RMCs who indicate interest in accessing and deploying at scale technologies for the commodity in question, can become a part of the compact. Request from the CTDCs for deployment of a list of technologies and resources required will be submitted to the RTDI, specifically the Program Steering Committee (PSC), who will work in tandem with the clearing house to review and approve the appropriate technologies. Figure 4 shows the structure of the Commodity Technology Delivery Compacts (CTDC).

4.1.5 The structure of the Regional Technology Delivery Infrastructure (RTDI) can be observed in figure 4 and 5.

The activities of the RTDI or TAAT platform include:

i) **Identification and selection of best-bet technologies** for uptake by RMCs involved in crop/livestock compacts; the RMCs will be front and center of the compacts to ensure ownership and sustainability with attention to specific value chains);

ii) **Improvement of seed systems**. Specific tasks are: evaluation of existing seed systems to identify strengths and weaknesses, identification of policy and capacity development needs to address the weaknesses and take advantage of the strengths, implementation of the identified policy and capacity development needs to strengthen the seed systems;

iii) **Harmonization of regional variety release systems** to ensure regional spillover effects of technologies. Specific tasks are: identification of constraints to variety release and access to improved varieties of crops in Africa and why varieties suitable for specific agro-ecologies cannot be applied to the wider ecological reach because of country boundaries, identification of policy and capacity-building options to address this issue, implementation of the identified policy and capacity building options on the ground, monitoring the effects);

iv) **Facilitation of trans-national control of pest and diseases**. Specific tasks are: awareness raising that pest and diseases do not respect political boundaries with clear examples, design and development of appropriate campaigns for trans-national control of pest and diseases, implementation of the agreed on campaigns for trans-national control of pest and diseases;

v) **Support RMCs with policy audits and reviews** to remove constraints to technology adoption and use;

vi) **Engage the Sub-Regional Organizations (SROs)** on harmonization of agricultural technology release and synchronization of foundation seed protocols, disease control, monitoring and Integrated Pest Disease Management (IPDM) methods[2], and adaptation trials of crop varieties across the region, including nutrient rich varieties;

vii) **Design and execute a comprehensive communication strategy** to effectively communicate the goals, activities, and benefits of the Agricultural Transformation Agenda;

[2] Integrated Pest and Disease Management (IPDM) is combining different methods of pest and disease control ranging from varietal resistance and tolerance, chemical control (pesticides, fungicides, bactericides, etc.), biocontrol (using natural enemies of the pests), cultural practices (crop rotation, mixed cropping, planting dates,, etc.), and

viii) **Fiduciary responsibility for the centralized activities of TAAT.**

Figure 3: ***Schematic of the Regional Technology Delivery Infrastructure***

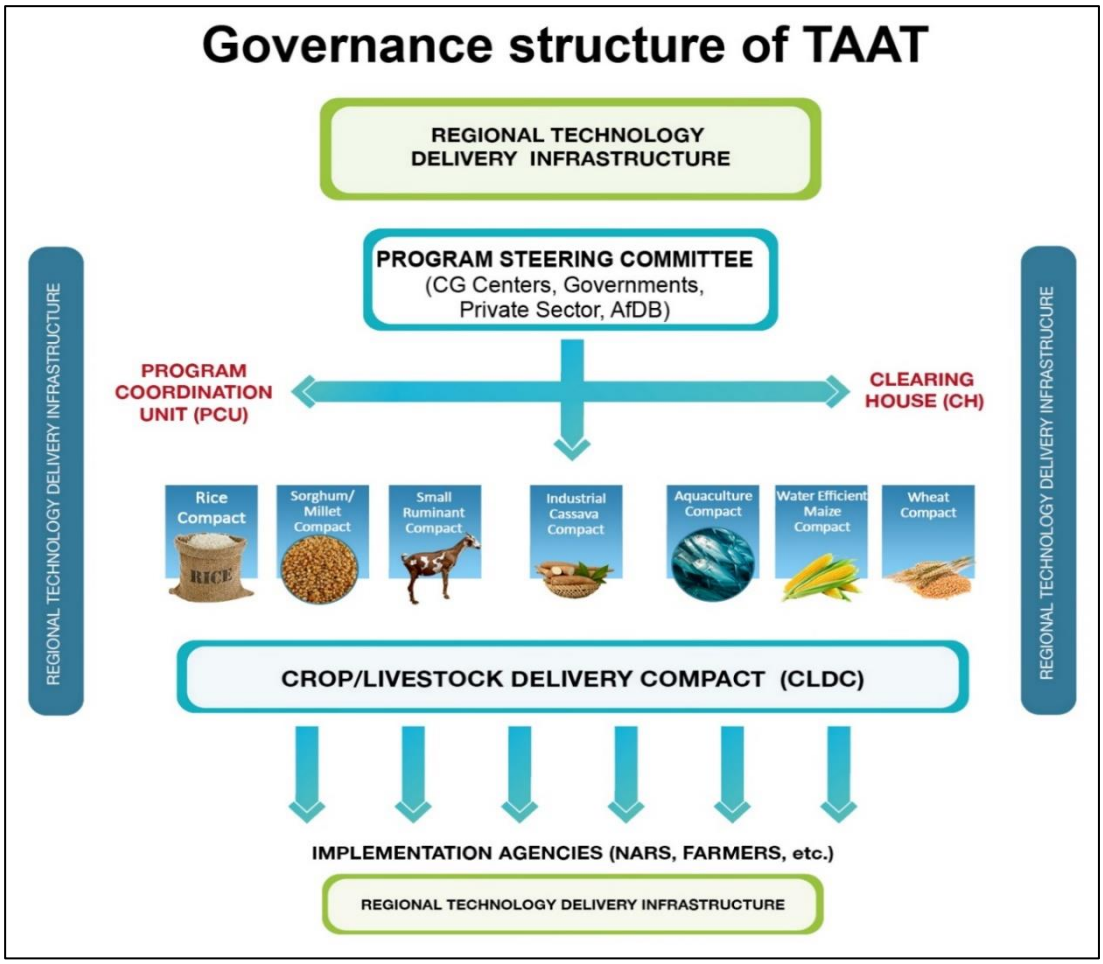
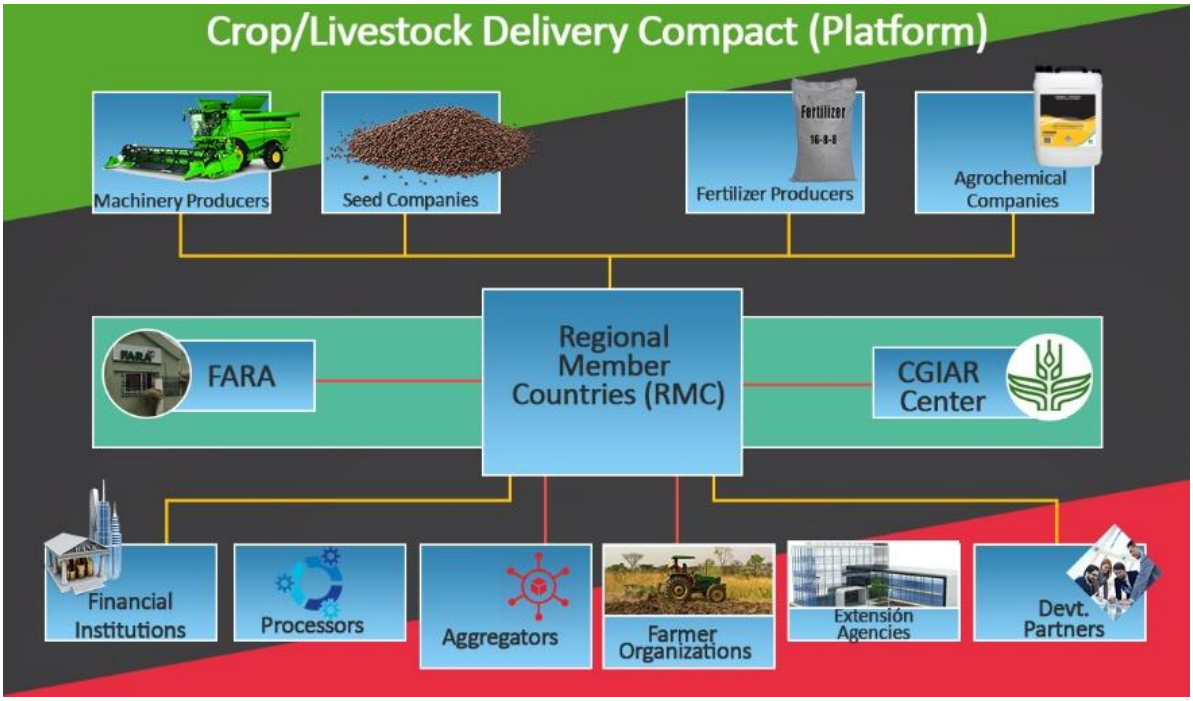


Figure 4: ***Schematic representation of the Commodity Technology Delivery Compact***



4.1.6 Two of such Compacts, CIPRISSA (for Rice) and TASI (for the African Savannahs) have already been set up by the Bank to coordinate activities for scaling up technologies to achieve self-sufficiency in rice production and for transformation of the African Savannah into bread baskets. The CTDC will also engage Development Finance Institutions (DFIs) and Development Partners, namely the World Bank, JICA, IFAD, BMGF, Rockefeller Foundation, African Agriculture Fund (AAF), Agriculture Fast-Track Fund, Fund for African Private Sector Assistance (FAPA), Making Finance Work for Africa Partnership (MFW4A), Africa Climate Change Fund, Clim-Dev Fund, and Climate Investment Funds (CIF), and many others to secure co-financing for TAAT.

4.1.6.1 The activities of the CTDC include:

i) **Convene a Crop/Livestock technology delivery platform of all major actors for each of nine priority commodities** (e.g., rice, wheat, aquaculture, water efficient maize for Africa, cassava, sorghum/millet, livestock, orange fleshed sweet potato, and high iron beans). Specific tasks are to consult, discuss, and prepare an agreement (the compact) of technologies, activities, and focus of the platform. The compact will discuss and agree on the technologies to be delivered, packaging, targets and timeline to cost-effectively deliver the technologies in a timely fashion;

ii) **Agree with NARES and Extension agencies on approaches to deploy technologies** Specific tasks are to meet with key stakeholders (NARES, Extension agencies, NGOs, private sector, etc.) in RMCs to discuss best approaches to deploy technologies; prioritize the approaches in terms of effectiveness; deploy the preferred approaches with the country's agencies leading; monitor progress, learn lessons and make immediate use of the lessons in improving delivery;

iii) **Define the target areas.** Specific tasks are to consult with the RMCs about which geographic areas to focus on during the different phases of technology deployment; discuss and agree with the RMCs on material and human resources required to cover the target area and how to sources these; implement the technology;

iv) **Mobilize all actors across the value chain.** Specific tasks are to identify and register all the key actors across each target commodity's value chain; call a meeting of the different actors across each target commodity value chain to ascertain constraints and how best to solve these; assign roles on technology delivery to different actors across the value chain; ensure that different actors across the value chain perform the assigned functions; monitor, learn lessons and make immediate use of the lessons in improving technology delivery;

v) **Design and implement wide-scale farmer extension models** and innovative models to organize and aggregate farmers;

vi) **Work with FARA and others to build capacity in the NARES** and public sector for program design, execution, and monitoring, and in the private sector for value chain organization and governance;

vii) **Support the development of a young class of 'agripreneurs'**, through demonstration, training and financing in coordination with ENABLE youth;

viii) **Promote climate-smart practices among farmers** through funding and demonstration of the value of sustainable agriculture approaches;

ix) **Set targets and KPIs**; monitor the achievement of the KPIs; distil lessons for improvements in future; . Specific tasks are to discuss and identify key target areas;

formulate the targets that are achievable; mobilize those needed to achieve the targets; identify appropriate key performance indicators (KPIs) for different targets set

x) **M&E of the platform,** using the outcome to improve the performance of the platform**.** Specific tasks are to design appropriate M&E data collection and analysis for the platform; discuss and ensure the leadership of RMCs in the M&E; implement the M&E.

4.1.7**. Project Management Unit (PMU)**

The Project Management Unit will: i) oversee day-to-day implementation of project fiduciary and administrative activities; ii) organize the transfer of project resources to the institutions leading the commodity value chains; iii) coordinate the compilation and review of reports from value chains and enablers for submission to the Bank; and iv) elaborate/implement administrative and financial management guidelines/template to be used across.

4.1.8 The decision to pursue TAAT through a consortium of CGIAR Centers, the National Agricultural Research Systems (NARES), and their Umbrella body, FARA, donors, and development centers was decided at the High Level Conference on Feed Africa held in Dakar, Senegal, October 21-23, 2015. At that meeting**,** the International Institute of Tropical Agriculture (IITA), being the oldest CGIAR center in Africa and the center with the most geographical spread – 20 sub-stations across the continent, was selected to coordinate the TAAT platform or the Regional Technology Delivery Infrastructure (RTDI). IITA is therefore the Executing Agency (EA)**.** IITA will set up a small Program Management Unit (PMU), headed by a competitively recruited Project Coordinator, to undertake fiduciary functions (procurement, disbursement, financial administration, reporting, audits, etc.). Specific MoUs and implementation agreements will be signed with each of the lead institutions of the target commodities and the other key Implementing Agencies (IAs).

4.1.9 The day-to-day management of the CTDCs is left to the various Lead Centers. Each Lead Center, or expert CGIAR center, shall prepare an annual work plan and budget that will be submitted for the review and approval by the Clearinghouse based on clearly defined deliverables. African Agriculture Technology Foundation (AATF), IITA, and CIMMYT will lead the Water Efficient Maize Production; AfricaRice and IWMI shall lead the activities within the Rice Self-sufficiency; IITA leads Cassava Intensification; ICRISAT lead in Sahel Food Security; ILRI will lead on livestock; World Fish will lead on fish initiative; ICARDA and CIMMYT are responsible for Wheat Self-sufficiency.

4.1.10 Policy support: International Food Policy Research Institute (IFPRI) will support the various institutions on policy issues that enhance successful program implementation and the attainment of the expected widespread and transformational impact. IFPRI will also work with other institutions that contribute to agricultural development policy work, including 'The African Seed Access Index (TASAI)', and African Technology Policy Study Network Program (ATPS). It will undertake its activities in consultation with each IA, reporting to clearinghouse.

4.1.11. Capacity development: Forum for Agricultural Research in Africa (FARA) shall undertake capacity building at all levels within partner institutions and within the Priority Intervention Areas (PIAs) and their value chains. They shall also sign a MoU with Regional Technology Delivery Infrastructure (RTDI), with indications of their expected role and terms of delivery as well as expected budget for the various activities. FARA will ensure that the thematic content of capacity development activities and modules are designed and administered in consultation with appropriate and qualified entities, including relevant and participating CGIAR Centers. FARA will also undertake its activities in consultation with each program initiative team and report to the Clearinghouse. An Activity Plan for each initiative will provide detailed work plans.

4.1.12 The National Agricultural Research and Extension Services (NARES) will be the primary delivery agent for the deployment of the selected technologies, in close consultation with the Government Ministries of Agriculture to ensure country buy-in. This will be supported by private sector entities and relevant donor/partner programs in the respective countries. These delivery channels include the AGRA supported input dealer network, the World Bank supported West African Agricultural Productivity Program (WAAPP) and similar programs in other regions. Support from CGIAR Centers Value Chain Leaders will be transactional, value for money and demonstrable benefits, supporting national institutions to roll out validated and branded technologies.

4.1.13 Mechanisms for timely startup include the early appointment of the Head of the Clearinghouse and Program Coordination team, and execution of implementing MoUs between IITA (the EA) and the implementing partners. This team will oversee the project inception workshop to elucidate all the plans for a smooth program take-off.

4.1.14 In the target RMCs, numerous donors are supporting overall agricultural development. Donor coordination occurs in different ways including through Thematic Working Groups, Sector Wide Approaches (SWAps), and Integrated Sector Approaches. For TAAT, the key donors that have indicated commitment so far include AfDB, World Bank, Bill and Melinda Gates Foundation, Rockefeller Foundation, and AGRA. These donors have been coordinating efforts through joint design workshops aimed at steering the development of TAAT for success and the achievement of the intended impact on the ground, and at ensuring that ongoing experiences are taken into account, and not duplicated (e.g., World Bank's WAAPP, EAAPP, and APSA; AGRA's work on input dealership; and BMGF's work on technology development; etc.). Several of such meetings were attended by representatives of other prospective donors such as USAID. This coordination is also critical for effective monitoring of the program, and will continue during program implementation.

4.1.15 Specific roles of each CGIAR center can be found in ***Table 8***.

4.2 Regional Public Goods (RPG) and Access to RPG Window of ADF 14:

4.2.1 TAAT meets all features (**Stages I** and **II**) of RPGs, namely: (i) ***non-rival benefits*** (i.e., one country's consumption does not subtract from the amount available to other countries), (ii) ***non-excludable*** (no country in the region can be excluded from benefiting, except at a prohibitive cost), (iii) ***broad public interest and benefit*** (as demonstrated by letters of expression of interest from 22 low-income ADF RMCs and three ADB RMCs and involvement of numerous NARES, FARA, SROs, and RECs in the formulation of TAAT)**;** (iv) ***regional dimension or multi-country involvement*** (22 low-income RMCs are targeted; Three ADB countries have expressed interest; TAAT adopts a regional, agro-ecological and commodity belt focus; TAAT will renew the drive to transform Agriculture in Africa by scaling up regional cooperation in combatting crop and livestock diseases, and accelerating delivery and development impact); (v) ***strong alignment with the Bank's strategic orientation and continental and regional objectives*** (TAAT is aligned with the Bank's Ten-Year Strategy and four of the five high priority goals - the "**High 5s**"- namely; Feed Africa, Industrialize Africa, Integrate Africa, and Improve the quality of life for the people of Africa; TAAT is one of the flagship initiatives identified in the Bank's recently approved Feed Africa: Strategy for agriculture transformation in Africa: 2016–2025); (vi) ***catalytic and upstream role*** (TAAT's interventions will remove bottlenecks and disincentives that have forestalled uptake of agricultural technologies in Africa and upstream segments of commodity value chains, making it catalytic and upstream; Given that the commodities of focus in TAAT are strategic to the Bank's RMCs, as underscored by CAADP, TAAT will clearly play a catalytic role to engender strong support for these commodities, and (vii) ***higher developmental impact in cooperating*** (given that crop and livestock diseases travel freely across national boundaries, making it impossible for individual countries to achieve anything better than in cooperation). The different products from the CGIAR's research work (earlier indicated) are indeed RPGs made widely available to individuals and organizations working for sustainable agricultural development in the world. It is for these reasons of ***public interest***, ***non-rivalry*** in partaking in the benefits from TAAT, ***multi-country***

involvement, and ***non-excludability*** that TAAT was selected among programs seeking support under the RPGs window as part of the 2017 RO prioritization exercise of the ADF-14 (see 2017 Regional Operations Prioritization and Selection Report, Ref. MJ/ADC/07/17/02 dated 28 July, 2017). Details are presented in ***Appendix 4***.

Table 8: The roles of CGIAR and other R&D Centers, and key stakeholders in TAAT

CGIAR Center/Collaborator	Role in TAAT
International Institute for Tropical Agriculture (IITA)	Global yam and cowpea R&D center; African center for maize and cassava. Will lead the work on cassava industrialization working with National Agricultural Research and Extension Systems (NARES) and collaborate with African Agricultural Technology Foundation (AATF) on Water Efficient Maize of Africa (WEMA). Coordinating Agency for TAAT.
International Food Policy Research Institute (IFPRI)	Global food policy R&D center. Will leads work on Policy Support Services, working with National Agricultural Research and Extension Systems (NARES) and Alliance for Green Revolution in Africa (AGRA)
Africa Rice	African rice R&D center. Will lead work on rice working with National Agricultural Research and Extension Systems (NARES) and International Rice Research Institute (IRRI)
International Center for Tropical Agriculture (CIAT, its Spanish acronym)	Global beans, cassava, and tropical forages R&D center. Will lead the high iron beans effort working with National Agricultural Research and Extension Systems (NARES)
International Center for Agricultural Research in Dry Areas (ICARDA)	Regional R&D center for dry areas. Will lead work on wheat working with National Agricultural Research and Extension Systems (NARES) and International Center for Wheat and Maize Improvement (CIMMYT, its Spanish acronym)
International Livestock Research Institute (ILRI)	Global livestock R&D center. Will lead work on small ruminants working with National Agricultural Research and Extension Systems (NARES)
WorldFish	Global fish R&D center. Will lead work on aquaculture working with National Agricultural Research and Extension Systems (NARES)
African Agricultural Technology Foundation (AATF)	African center for the acquisition and licensing of agricultural technology from around the world. Will lead the Water Efficient Maize for Africa (WEMA) effort working with National Agricultural Research and Extension Systems (NARES), International Institute for Tropical Agriculture (IITA) and International Center for Wheat and Maize Improvement (CIMMYT, its Spanish acronym)
International Center for Insect Physiology and Ecology (ICIPE)	African R&D center for pest control. Will work with the Center for Agricultural Biosciences International (CABI), CIMMYT, and National Agricultural Research and Extension Systems (NARES) on control of Fall Army Worm
Center for Agricultural Biosciences International (CABI),	Global R&D center for agriculture and biosciences. Will work with the International Center for Insect Physiology and Ecology (ICIPE), CIMMYT, and National Agricultural Research and Extension Systems (NARES) on control of Fall Army Worm
International Center for Wheat and Maize Improvement (CIMMYT, its Spanish acronym)	Global R&D center for wheat and maize. Will collaborate with African Agricultural Technology Foundation (AATF) on Water Efficient Maize for Africa (WEMA)
International Potato Center (CIP, its Spanish acronym)	Global potato R&D center; will lead the work on orange fleshed sweet potato working with National Agricultural Research and Extension Systems (NARES)
International Rice Research Institute (IRRI)	Global rice R&D center; will work with AfricaRice and the NARES on rice production and post-harvest technologies.
International Water Management Institute (IWMI)	Global water management R&D center. Will work on irrigation with AfricaRice on rice and with International Center for Agricultural Research in Dry Areas (ICARDA) on wheat
Alliance for Green Revolution in Africa (AGRA)	AGRA will provide parallel financing, lead downstream delivery of TAAT technologies, help strengthen policy dialogue with national governments and the private sector to shape and ensure a shared commitment to improving delivery systems, working with IFPRI. AGRA will also be involved in Capacity Development and Outreach work led by FARA.
Regional Member Countries (RMCs)	RMCs via National Agricultural Research and Extension Systems (NARES) will work with the lead CGIAR centers, Sub-Regional Organizations (SROs) on agricultural commodity value chains carrying out policy reforms, crop outreach campaigns, regional disease and pest control initiative. RMCs will also organize producers into farmer organizations and link to existing market and financial support programs. RMCs will also leverage country investment programs to execute TAAT.
National Agricultural Research and Extension Systems (NARES)	National Agricultural Research and Extension Systems (NARES) will be involved in deploying the selected technologies at country level, among other things.
Forum for Agricultural Research in Africa (FARA)	FARA shall undertake capacity building at all levels within partner institutions and in the PIAs and their constituent value chains.
Sub-Regional Organizations (SROs)	Sub-Regional Umbrella bodies of NARS; will lead regional policy effort
African Women in Agricultural Research and Development (AWARD)	AWARD will collaborate to ensure that women are given priority attention in all cases.
World Bank	Major partner in financing TAAT at Country level. Expected financing at level of USD 700 million

4.3 Cost-sharing exemption

4.3.1 The centrally managed activities planned to be funded with RPG resources in Phase I of TAAT do not have revenue generating capacity. They are designed to target 22 low-income RMCs and set the stage for upcoming phases, which will require cost-sharing by participating countries, and country programs (funded through loans), both of which will benefit and deepen the application of science and technology to sustainable agricultural development in Africa. In addition, given TAAT's regional, agro-ecological and commodity belt focus, six of the targeted 22 low-income RMCs (Chad, Congo DRC, Guinea-Bissau, Mali, Sierra Leone, and Sudan) are loan ineligible and in fragile states. TAAT therefore meets the eligibility for cost-sharing exemption and qualifies for financing through grant resources outside the PBA allocation *(i.e. exclusively from the RO envelope).* In line with this policy, OpsCom has cleared the cost-sharing exemption for the initial phase of the program, and recommends that cost-sharing should be explored in subsequent phases after the project is launched. Management considers that TAAT meets the eligibility for cost-sharing exemption and therefore seeks Board approval for financing of TAAT through grant resources outside the PBA allocation. Details on TAAT's eligibility for the grant funding and cost-sharing exemption are presented in ***Appendix 9***.

4.4 Linking centrally managed programs to country programs

4.4.1 TAAT has two planks: the centrally managed operations and the subsequent country programs. The benefits that the former will deliver are catalytic and upstream to the main country investment programs which will further be financed by the Bank and its partners (the WB, IFAD, AGRA, BMGF, etc.). Without TAAT and the support of the Bank, investments by the World Bank and development partners may not achieve as great a development impact. A good example is in the control of regional pest and disease threats to increased productivity.

4.5 Private Sector Participation

4.5.1 TAAT is developing a unique approach to working with the private sector via the Commodity Technology Delivery Compacts. Over 40 private sector organizations ready to partner with TAAT were identified during the course of project development. These businesses operate in the areas of input manufacture and distribution, commercial seed and propagule production, bio-fertilizers, irrigation equipment and supplies, greenhouse construction and food processing. TAAT will create business opportunities for the private sector by building seed systems in the rural areas, including agro-dealer networks, thereby expanding demand for seeds and services (crop insurance). The Commodity Technology Delivery Compact will ensure that the private sector is at the table as opportunities are being discussed.

4.6 Procurement Arrangements

4.6.1 Procurement of goods, works and the acquisition of consulting services financed by the Bank for the program, will be carried out in accordance with the "Procurement Policy and Methodology for Bank Group Funded Operations" (BPM), dated October 2015 and following the provisions stated in the Financing Agreement. Donor partners (WB, AGRA, BMGF, etc.) may use their own procurement rules over the resources which they contribute and implement in a parallel arrangement. The Bank procurement rules will apply to Bank financed activities. Specifically, procurement and financial management would be carried out as described in ***Appendix 10 and Appendix 11***.

4.7 Monitoring and Evaluation Arrangements

4.7.1 As part of the M&E System to be carried out by the Commodity Technology Delivery Compact (CTDC), advanced monitoring tools aligned with the Bank's Agricultural Transformation Agenda indicators will be used to ensure day-to-day effective performance measurement. This includes but is not limited to options available at IITA and across its CGIAR Centers including participatory field-level

assessments, remote sensing, GIS, Big Data operations that compile and analyze program and national statistics, and advanced statistical diagnoses. Monitoring functions will be accompanied by detailed training in the use of these tools; as such, reporting will stem from participatory monitoring methods and structured data collection instruments. The functions of Knowledge Management are central to the M&E Framework and will be designed as a continuous, dynamic, action-reflection-action process. An independent external review will be carried out for TAAT at the end of year 2 (2019).

4.7.2 An inception report will be prepared by the implementing partners, including baseline status, detailed work plans and budgets, as well as communication and technology deployment plans. All implementing partners will provide quarterly updates and regular situation reports; a mid-term progress report by each IA; a midterm progress report by the Clearinghouse; annual audit reports by independent external auditors; regular supervision reports would be carried out jointly by AFDB Country Offices and the Clearinghouse for national level interventions. All reports would be shared among the partners in the TAAT Framework.

4.8 Sustainability

4.8.1 The sustainability of TAAT will be achieved through: i) stronger links between research and extension; ii) stronger linkages of farmers to markets; iii) focus on agricultural value chains to ensure that the demand and supply sides are integrated; iv) supportive policy and regulatory environments; and v) expected higher commitment of governments to agriculture in the focal countries.

4.9 Potential Risks and Mitigation Measures

4.9.1 Potential risks and measures to mitigate are shown in Table 9.

Table 9: Risks and Mitigation

Potential Risks	**Mitigation Measures**
Lack of enabling environment (policy, market, etc.).	Provide fact-based & targeted advocacy.
Weak value chain linkages especially to off-takers and processors	Build capacity of outgrowers around established commercial companies and processors
Lack of commitments of stakeholders in implementation	Active engagement of all stakeholders, with clear roles
Lack of commitment & logistical support to enable training	Sensitization & identification of strategic training partners.
Policy inconsistency (on part of governments) & long process in changing policies.	Dialogue using fact-based rationale for losses due to policies *status quo*
Lack of commitment by the youth involved in technology promotion and demonstration.	Proper orientation on mindset change through participatory approaches and incubation centers.
Lack of cooperation by government agencies	Dialogue for buy-in.
Weak NARES capacity and resource base	Be focused on important specific interventions. Capacity of NARES strengthened.
Retaining earlier promising technologies that become obsolete along the way	The Clearinghouse will institute a mechanism for identifying and decommissioning obsolete technologies

5. LEGAL INSTRUMENTS AND AUTHORITY

5.1 Legal instrument

5.1.1 The legal instrument to finance the centralized activities of the TAAT Framework Program is an **ADF grant** (from the Regional Public Goods window) for the eight CGIAR centers who will be involved in management of core TAAT activities. A Protocol of Agreement shall be entered into between by IITA on behalf of the CGIAR Centers and the Fund. Conditions for Fund intervention and disbursement can be found in ***Appendix 12***.

5.2 Undertakings

5.2.1 The Recipient (IITA) shall undertake to: i) Execute an Implementation Agreement with each of the implementing agencies; ii) Submit legal opinion(s), issued to the Fund by legal counsel acceptable to the Fund, in respect of each of the Implementation Agreement(s) submitted to the Fund, confirming

that the Implementation Agreements(s) between IITA and the relevant implementing agency has been duly authorized, ratified and executed on behalf of IITA and the relevant implementing agency, and constitutes a legal, valid and binding agreement on both parties; and iii) Not apply for withdrawal of the relevant portion of the proceeds of the Grant in respect of any implementing agency that has not executed an Implementation Agreement with the Recipient.

5.3 Compliance with Bank Policies

This program complies with all applicable Bank policies.

6 RECOMMENDATIONS

The Boards of Directors are hereby requested to:

(i) Approve TAAT as a Framework Program to be implemented in three (3) phases;

(ii) Approve a Grant of Twenty Nine Million Units of Account (UA 29,000,000) from the regional public goods envelope of ADF-14, to IITA, for the purpose of implementation of centrally managed activities (for ADF-only countries while partner resources will support ADB countries) of the first phase and deployment of the first set of nine priority food production technologies, subject to the terms and conditions stipulated in this report;

(iii) Approve an exemption from cost-sharing for phase 1;

(iv) Take note that Management will submit to the Board(s); (a) on an annual basis, a status report on the implementation of the TAAT Framework Program; (b) separate specific proposals for the financing of the second and third phases subject to satisfactory implementation of the first phase, for consideration and decision in accordance with applicable Bank Group policies; and c) the requests for country program funding as these originate from specific RMCs.

Appendix 1: *The TAAT Clearinghouse (C-House)*

The purpose. Low productivity of African agriculture is a consequence of, among others, a lack of access to yield enhancing technologies or the resources to acquire them at scale. Successful crop/livestock campaigns to close yield gaps in several African countries (e.g., Liberia, Malawi, Nigeria, Kenya) are characterized by key elements, including: major political decision to reach millions of farmers with inputs, best fertilizer recommendations and best available seeds, development of agro-dealer networks and input supply chains. Other are market and infrastructure development, easy access by farmers to finance - often with no collateral based on risk guarantee schemes, crop insurance, smart policies and incentives, and media coverage of positive results, and mitigation of climate change. All these factors must feature in any plan to reach millions of farmers in a successful and sustainable way and the C-House ensures the success of TAAT campaigns given the above factors for success.

The Clearinghouse is the main vehicle driving implementation. It should be substantially autonomous and its work plan and budget approved by the Program Steering Committee (PSC). The Clearinghouse, in association with each CG Center and the State institutions will manage the platform systems (earlier successfully applied under the SARD-SC project) described in an Annex in Vol. II of the Report.

Objective. The objective of the C-House is to take proven agricultural technologies to scale in a commercially sustainable fashion through the establishment of a mechanism to facilitate partnerships and provide access to expertise required to design, implement, and monitor progress of crop, livestock, and aquaculture campaigns.

Activities. The activities of the C-House include: i) Conduct an assessment/mapping exercise of target value chain and the surrounding ecosystem, and make technological and non-technological offer to address at scale the constraints; ii) Propose a multi-stakeholders agricultural technology deployment plan on how to go sustainably to scale; iii) In collaboration with the Bank advise the Governments and private actors on investment opportunities and financing mechanisms for going to scale; iv) Identify the optimal mix of partners - from CG and non-CG system, that will accompany the implementation backstopping and monitoring of the proposed plan; v) Validate the design and plan with stakeholders for a buy-in and commitment; vi) In collaboration with the RMCs implement the plan and monitor milestones and Performance Indicators; vii) Working with FARA and others, build capacity in the public sector for program design, execution, and monitoring, and in the private sectors for value chain organization and governance; and viii) Design and execution of a comprehensive communication strategy to effectively communicate the goals, activities, and benefits of the Agricultural Transformation Agenda.

Structure. The structure of the C-House is organized along principal objectives of: i) Partner engagement; ii) Program design and monitoring; iii) Capacity building; iv) Communication; and v) Gender and youth employment as cross-cutting issues. The C-House shall be independent of the IITA management and have its own advisory board. It cannot be located within the TAAT PMU but rather operate as an independent unit. The Clearinghouse will be based at the IITA sub-station in Cotonou with a Head supported by technical and support staff.

Key skills required. The key skills assets required in the C-House include: i) head of partner engagement; ii) technology transfer specialist; iii) an outreach expert; iv) a communication expert; v) a gender development specialist, and vi) M&E Specialist in addition to other general services staff.(see Detailed Cost Tables).

Infrastructure. The C-House will take advantage of existing infrastructure at IITA and will be located on one of IITA's campuses in Cotonou, similar to the Business Incubation Platform (BIP) an entity for commercialization of research findings at IITA.

Agricultural transformation incubation platform. As an agricultural transformation incubation platform, the C-House aims at facilitating partnerships, program design/implementation to help reach millions of farmers with appropriate agricultural technologies, and reducing transaction costs.

Appendix 2: ***Priority Intervention Areas (PIA) of TAAT by agro-ecology and commodities***

Priority Intervention Areas (PIA)	**Agro-ecology**	**Commodity Value Chain**
Self-sufficiency in rice	Lowland	Milled and parboiled rice
Cassava intensification	Humid Forest & Sub-Humid Savannahs	Cassava
Transforming the Savanna Zone into Africa's breadbasket	Sub-Humid Savannahs	Maize, soybean, livestock
Achieving Food Security in the Sahel	Semi-Arid	Sorghum, millet, livestock
Restoring Tree Plantations	Humid Forest & Sub-Humid Savannahs	Cocoa, cashew, oil palm, tea
Expanding Horticulture in Africa	Humid Forest, Humid Savannahs, & Semi-Arid	Tomato, pulses, leafy vegetables, sweet potatoes
Expanding wheat production in Africa	Mediterranean and Semi-Arid irrigated	Wheat
Expanding fish production in Africa	Humid Forest, and Humid Savannahs, Semi-Arid, and Mediterranean	Aquaculture

Appendix 3: ***Combating the Fall Army Worm***

Combating the Fall Army Worm

The Fall Armyworm (FAW), *Spodoptera frugiperda*, is a moth that is indigenous to the Americas. It is one of the most damaging crop pests in the Americas, feeding on over 80 different crops, including maize, rice, sorghum and sugarcane. The Armyworm was reported for the first time in Africa in 2016, discovered in Nigeria, and has already managed to spread to at least 40 African countries. Without appropriate action, Fall Armyworm (FAW) could cause 21-53% maize yield losses in just 12 African countries. The value of these losses is estimated at between US$2.48 billion and US$6.187billion. FAW should be expected to spread throughout suitable habitats in mainland sub-Saharan Africa within the next few cropping seasons. Northern Africa and Madagascar are also at risk.

Meetings of technical experts from within and outside the African continent have been convened by USAID, FAO, and the Centre for Maize and Wheat Improvement (CIMMYT, its Spanish acronym) to draw up a plan to control FAW. The Department for International Development (DFID) of the UK also approached the African Development Bank (AfDB) to take the lead in the control of FAW. AfDB hosted a side event on FAW at the World Food Prize Foundation's Borlaug symposium in Des Moines, Iowa, to provide global awareness and invite other donors to participate in what may be the largest emergency response to a crop in Africa. Participants from of USAID, CABI, ICIPE, CIMMYT, the Private sector (Monsanto and Dow Agro) attended the meeting.

The consensus of the meeting was a regional approach that emphasizes Integrated Pest and Disease Management (IPDM) is required to contain FAW. Immediate recommendations include (i) awareness raising campaigns on FAW symptoms, early detection and control, including beneficial agronomic practices; (ii) national preparation and communication of a list of recommended, regulated pesticides and biopesticides and their appropriate application methods. Work should also start immediately to (i) assess preferred crop varieties for resistance or tolerance to FAW; (ii) introduce classical biological control agents from the Americas. A conducive policy environment should promote lower risk control options through short term subsidies and rapid assessment and registration of biopesticides and biological control products. Digital methods of scouting, turning millions of farmers with cell phones into scouts who can report back on incidence, was also recommended. TAAT will tackle the regional threat of FAW along the recommended interventions via a regional effort involved RMCs, represented by NARES, IITA, CIMMYT, ICIPE, CABI, and Sub-Regional Organizations.

Appendix 4: ***Check-list of criteria for financing RPGS***

Project Name	MULTINATIONAL – TECHNOLOGIES FOR AFRICAN AGRICULTURAL TRANSFORMATION (TAAT)
Department	AHAI
Countries involved	Overall, TAAT will be implemented in three phases in 22 low-income RMCs (Benin, Burkina-Faso, Cameroon, Chad, Congo DRC, Ethiopia, Gambia, Ghana, Guinea-Bissau, Kenya, Malawi, Mali, Mauritania, Niger, Nigeria, Rwanda, Senegal, Sierra Leone, Sudan, Tanzania, Uganda, and Zambia) of the Bank that have written to express interest in participating. Six of these (Chad, Congo DRC, Guinea-Bissau, Mali, Sierra Leone, and Sudan) are fragile and conflict-affected states. However, it should be noted that TAAT will produce Regional Public Goods (RPGs) of public interest; no one can be excluded from it and also from the spillover benefits, given their public goods characteristics (see below). Phase 1 of TAAT will focus on nine agricultural commodities: Cassava, Maize, Rice, Wheat, Sorghum/Millet, Small livestock (goats and sheep), Aquaculture, orange fleshed sweet potato, and high iron beans.
Regions involved	Central, West, East, Southern and others given the public goods characteristics of the proven agricultural technologies dissemination planned in TAAT (see below).
CRITERION	**SHORT EVALUATION (BULLET-POINTS)**
Stage I:	
Non-rivalry: Public goods are those whose benefits can be enjoyed by one party without (or hardly) reducing the availability of these benefits to others. The project will demonstrate that the object of assistance within the project is something whose benefits will be consumed by more than one party and that a provider cannot keep non contributors from consuming the benefit of that good. Some examples can be terms of trade, cross-boundary diseases (animal and human), shared water resources, cross-border roads.	TAAT has a spectrum of benefits that all the target beneficiaries along the value chains of the target commodities can enjoy simultaneously. These are: (i) agricultural innovations such as gender-sensitive proven technologies (that reduce the workload and hardship, especially for women), (ii) climate proof crop germplasm, (iii) control of Fall Army Worms, (iv) food security, (v) import substitution for the Phase I target commodities (cassava, maize, rice, wheat, sorghum/millet, small livestock, and aquaculture) due to increased domestic production, (v) savings in foreign exchange (due to reduced food importation), (vi) new employment opportunities and increase in rural income of farmers and entrepreneurs, (vii) improvements in the national economy, (vii) capacity building, (viii) congenial policies and institutional frameworks (for profitable and sustainable value chains development), and (ix) integration of production with markets. Based on the principle of comparative advantage, TAAT will result in increases in production, processing and marketing of agricultural commodities that will simultaneously benefit all the target beneficiaries with substantial spillovers to others given the public goods nature of the planned deployment of technologies envisaged. This will be enhanced by innovative partnership among the national and international institutions, advanced research institutions, Forum for Agricultural Research in Africa (FARA), and the Alliance for a Green Revolution in Africa (AGRA), among numerous other partners as designed in TAAT. Besides, there is an important differential among RMCs in terms of knowledge and know-how related to the commodities targeted in Phase 1I. As a result, TAAT will aim at using complementarities across the countries to cause trans-boundaries and trans-national spillover effects on the development of the target value chains and achieve sizeable regional critical masses in terms of human and physical capacities.

Non-excludability: It is difficult or prohibitively expensive to exclude others (Countries / communities/ regions) from enjoying/ consuming the generated benefits. The project will demonstrate that there is no way that non-participating countries/ communities can be stopped from enjoying the generated benefits because of the nature of the object of the project's assistance.	Under the TAAT, the proven technologies dissemination activities of the implementing CGIAR institutions and partners (e.g., AGRA, FARA, AATF, *icipe*, AWARD, etc.) were designed to directly benefit individual farmers and consumers, agricultural commodity processors, farmers' groups including youth and women, policy makers, private sector operators, marketers/traders, transporters, small-scale agricultural machinery manufacturers, and institutions (NARES, CGIAR, NGOs) from low income Bank's RMCs are the project direct beneficiaries. However, it should be noted that TAAT will produce Regional Public Goods (RPGs) (proven agricultural technologies) of public interest; no one can be excluded from these. The proven new crop varieties, control of Fall Armyworm, crop management practices, knowledge and other products from the CGIAR's research work and similar institutions are "international public goods" (IPGs), made widely available to individuals and organizations working on sustainable agricultural development world-wide. By design, the CGIAR centres, which have a long experience working in networking with NARES, will work in partnership with the NARES and advanced institutions (e.g., AGRA, FARA, *icipe*, TASAI, AWARD, etc.) in all aspects of project implementation, with the RMCs being front and centre. Besides, TAAT will support thematic networks, conferences and large outreach media to ensure easy and unrestricted project information flow among RMCs.
Of Public Interest*:* The good is of broad public interest and benefit. Typically, a public/ governmental entity in each participating country is typically responsible for the regulatory/policy context for the good to be produced and takes part in its production. The project will demonstrate that there is either an inter-governmental coordinating body in place or an existing REC to regulate and oversee the function and coordination of the object of support in a proposed project. As such, the project will demonstrate to what extent the intergovernmental body and/or REC has taken steps to ensure the maintenance of the object of support and to what level of success.	Twenty two (22) low-income RMCs (Benin, Burkina-Faso, Cameroon, Chad, Congo DRC, Ethiopia, Gambia, Ghana, Guinea-Bissau, Kenya, Malawi, Mali, Mauritania, Niger, Nigeria, Rwanda, Senegal, Sierra Leone, Sudan, Tanzania, Uganda, and Zambia) of the Bank that have written to the Bank, through either their Ministry of Finance or Ministry of Agriculture, expressing interest to participate in TAAT. Six of these (Chad, Congo DRC, Guinea-Bissau, Mali, Sierra Leone, and Sudan) are fragile and conflict-affected states. Although the executing agency and the lead implementing agencies for TAAT are mostly the CGIAR centers (AfricaRice, ICARDA, IFPRI, ILRI, IITA, WorldFish, IWMI, ICRISAT, etc.), the implementation on ground will be spearheaded by relevant NARES, AGRA, FARA, Universities, AWARD, and policy making institutions across the target low-income countries, among others. At the regional level, the Regional Coordinator will interface with the relevant Regional Economic Communities (RECs) and ensure that regional integration elements are strong. The partnership between the NARES (including Universities), AGRA, FARA, and the CGIAR centers is fundamentally predicated on the three strategic objectives of the reformed CGIAR. These strategic objectives are: (i) Food for people (aims at creating and accelerating sustainable increases in the productivity and production of healthy food by and for the poor), (ii) Environment for people (aims at conserving, enhancing, and sustainably using natural resources and biodiversity to improve the livelihoods of the poor in response to climate change and other factors), and (iii) Policies for People (aims at promoting policy and institutional change that will stimulate agricultural growth and equity to benefit the poor, especially rural women and other disadvantaged groups). These strategic objectives perfectly coincide with the key aims and aspirations of the Bank's RMCs, as encapsulated in their different development agenda.

Stage II	
Multi-country involvement: The public good involves two or more countries and can only be effectively produced if every country involved participates and supports its production. The project will demonstrate that there are at least two countries involved with regards to the object of support (5%) and that the object of support in the Bank's investment is something that is either of a global and/or regional development importance and this should be demonstrated through a regionally/globally validated document (for example the "Convergence Plan of COMEFAC" outlining the work in the Congo Basin, a UN document agreeing on steps to reduce climate change, SADC gender action plan, the ECOWAS memorandum on Food Crisis, etc.) confirming this importance (10%).	TAAT is one of the flagship programs that arose out of the Pan-Africa Feed Africa Conference held in Dakar in October, 2015. Overall, it will be implemented in three phases in 22 low-income RMCs (Benin, Burkina-Faso, Cameroon, Chad, Congo DRC, Ethiopia, Gambia, Ghana, Guinea-Bissau, Kenya, Malawi, Mali, Mauritania, Niger, Nigeria, Rwanda, Senegal, Sierra Leone, Sudan, Tanzania, Uganda, and Zambia) of the Bank that have written to express interest in participating. Six of these (Chad, Congo DRC, Guinea-Bissau, Mali, Sierra Leone, and Sudan) are fragile and conflict-affected states. However, it should be noted that TAAT will produce Regional Public Goods (RPGs) of public interest; no one can be excluded from it. Phase I will focus on nine (9) agricultural commodities: Cassava, Maize, Rice, Wheat, Sorghum/Millet, Small livestock, Aquaculture, orange fleshed sweet potato, and high iron beans. Through a value chain approach, TAAT is focused on contributing to poverty reduction and enhanced food security through proven technologies deployment for the commodities mentioned above. Most of these are among the strategic commodities retained by African Heads of State through NEPAD/CAADP intensive, widespread, and interactive consultations. This also fed into the consultations of the Global Forum on Agricultural Research (GFAR) through the Global Conference on Agricultural Research for Development (GCARDs) that greatly shaped the Consortium Research Programs (CRPs) of the reformed CGIAR.
Strategic Alignment: The RPG is strongly aligned with the Bank's strategic orientations and also to continental and regional objectives (i.e., RPGs identified as priority operations under NEPAD or REC regional integration plans). Harmonization and partnership will be encouraged by giving preference to co-financing arrangements that promote donor coordination and leverage the Bank's own resources by mobilizing additional funds, including from sister institutions or the private sector. The project will demonstrate that the RPG is closely aligned with the continental and regional development agenda as well as the Bank Group's own strategy, especially with regard to selectivity and sector focus, and harmonization and partnership.	TAAT is one of the flagship initiatives identified in the Bank's recently approved Feed Africa: Strategy for agriculture transformation in Africa: 2016–2025. Through it, the Bank is contributing to the reformed CGIAR by supporting CRPs on: (i) maize, (ii) rice-based systems (GRiSP), (iii) roots and tubers, (iv) wheat, and (v) institutions and markets (includes value chain analysis), among others. TAAT aligns with CAADP's pillar 3 (Promoting Agricultural Research and Technology Dissemination and Adoption) and pillar 4 (Increasing Food Production and Security). It also aligns with the 'new' CGIAR's research result-oriented vision to reduce poverty and hunger through high quality international agricultural research, partnership and leadership. While coordinating with the CGIAR centers, the Bank is engaging with other donors for co-financing of the TAAT program. One of such co-financing meeting was held in Abidjan, on 1 Dec., 2016, at the instance of the Bill & Melinda Gates Foundation. USAID, AGRA, and IITA participated. The Dec. 1, 2016 partners meeting and earlier ones (e.g., during the Forum of African CEOs, in Geneva in March 2017) involved the World Bank, the International Fund for Agricultural Development (IFAD), the Rockefeller Foundation, and the Japan International Cooperation Agency, among others, resulted in currently available co-financing fund of US$ 700 million, US$ 230 million, and US$ 1.13 million from the World Bank, AGRA, and BMGF, respectively.

Catalytic and Upstream Role: Bank financing targets the ***initial stages*** of the processes for generating the public good and the Bank's support should aim at ***correcting disincentives*** that prevent the RPG from emerging or progressing toward the stage of production, such as lack of coordination, aversion to risk, free-rider problem. The project will demonstrate that the Bank is supporting an initial investment to an object and that by doing so opens the way for further investments by partners/ RMCs in the regional or national context for specific development impact (to be specifically demonstrated). Under this criterion, the project will also demonstrate that without the Bank's intervention, there is a risk of certain beneficiaries free-riding and not being held accountable. The project will demonstrate that the Bank's intervention will add value to strengthen coordination in the region generally and/or through the intergovernmental body or REC involved (if any).	Given that the commodities of focus in TAAT are strategic to the Bank's RMCs, as underscored by CAADP, the Bank has clearly been playing a catalytic role to engender strong support for the program. For instance, the Bank is coordinating with the CGIAR-supported centers, FARA, AGRA and other implementing partners to engage other donors for co-financing TAAT and bring about the required transformational and widespread impact. As indicated above, some of the donors (World Bank, BMGF, and AGRA) have positively responded. With the support of the Bank, the borrower, the CGIAR centers, is also involved in contacting donors for Co-financing. The sustainability of TAAT project is hinged on eleven factors: (i) Broad spectrum of the NARES involved; (ii) Implementation through existing local institutions/organizations; (iii) Linkage with relevant ongoing initiatives; (iv) Adoption of science-based value-chain approach; (v) Capacity building of all stakeholders along the value chain; (vi) Deployment of proven agricultural development technologies; (vii) New knowledge and technologies from CGIAR centers and partner technology-providing institutions are International Public Goods; (viii) Government support; ix) Well though-out partnerships; x) Robust private sector involvement; and xi) Appropriate and clear exit strategy. The value chain approach adopted by the program creates the necessary incentives for all the players from production, through processing and value addition, to market development to be profitably engaged. Supported by cross-cutting topics such as policy support services, capacity development and outreach, youth entrepreneurs, and the clearinghouse services that are tacitly part of TAAT, these are critically important to ensure sustainability of the outcome of the program, sustainability and continuity after the program ends, and ensuring that the program activities are adapted to fit local conditions.
Higher Developmental Impact in Cooperating: The development impact to be achieved through countries' cooperation is demonstrably superior to what each country could have achieved individually. The project will go on to demonstrate that the development impact (to be specified by the team e.g. poverty reduction, gender equity, human development, etc.) will be increased only if the object of support is addressed within a regional context with the participation of at least two countries (as opposed to national projects).	In Africa, public investments in dissemination, deployment, and promotion of proven agricultural development technologies and innovations are so limited that no one country by itself can meet investment needed for such endeavors whose outcome could lead to widespread and transformational impact aimed at under the TAAT program. By creating regional networks of NARES, involving the RECs, and building functional collaboration with CGIAR centers, FARA, and AGRA, to mention a few, TAAT will generate a global output that surpasses the summation of individual countries' efforts. For any given commodity, regional critical mass of human and material resources needed for the deployment of proven agricultural technologies and innovations will be mobilized to tackle county specific, cross border, and trans-national issues. The Clearinghouse, working closely with both the Regional Coordinators and the RECs will ensure that this happens and also bring about regional integration for a wider scale impact.

Appendix 5: *Countries that have expressed interest in TAAT with projects in the pipeline*

S/No.	Country	Projects	Aligned to inserting a TAAT component? (X = Yes)
1	Gambia	PROJET DE NUTRITION COMMUNAUTAIRE (PNC1) - 2018	
2	Benin	PROJET ENTREPRENARAIT AGRICOLE JEUNE - 2018	X
3	Ethiopia	INTEGRATED AGRO INDUSTRIAL PARK DEVELOPMENT PROJECT - 2018	X
4	Tanzania	AGRICULTURAL VALUCHAIN PROJECT - 2018	X
5	Uganda	AGRICULTURAL VALUE CHAINS DEVELOPMENT PROGRAM (INCLUDING IRRIGATION) – PROJECT 2 - 2020	X
6	Zambia	ZAMBIA YOUTH IN AGRI-BUSINESS AND AGRICULTURE COMMODITY CORRIDORS PROGRAM - 2018	X
		FARM BLOCKS IRRIGATION PROJECT (LUSWISHI FARM BLOCK DEVELOPMENT PROJECT) - 2018	X
7	Morocco	PROJET DE PROMOTION DES CHAINES DE VALEURS ET DE L'ENTREPRENARIAT AGRICOLE - 2018	X
		PROGRAM D'APPUI AUX RÉFORMES POUR LE DÉVELOPPEMENT DES FILIÈRES AGRICOLES DURABLES - 2018	X
8	Sudan	AGRICULTURE AND VALUE CHAIN DEVELOPMENT PROJECT	X
9	Tunisia	PROJET DE DÉVELOPPEMENT DE LA CHAINE DE VALEUR DE L'HUILE D'OLIVES - 2018	
		PROJET DE DÉVELOPPEMENT ET DE PROMOTION DES FILIÈRES AGRICOLES DE ZAGHOUAN - 2018	X
		PROJETS DE DÉVELOPPEMENT ET DE PROMOTION DES FILIÈRES AGRICOLES DE KASSERINE ET DE MAHDIA - 2019	X
10	Senegal	PROJET NATIONAL APPUI IRRIGATION LOCALE PNDIL	X
11	Nigeria	AGRICULTURE TRANSFORMATION AGENDA SUPPORT PROGRAM - PROJECT II (ATASP-2) - 2018	X
		FISHERIES SECTOR SUPPORT PROJECT – BLUE ECONOMY 2019	X
12	Ghana	AGRICULTURE VALUE CHAIN PROJECT – 2017/2018	X
13	Mauritania	AGRICULTURE VALUE CHAIN PROJECT - 2018	X
14	Malawi	SHIRLEY VALUE CHAIN PROJECT – 2017/2018	X
15	Cameroun	LIVESTOCK VALUE CHAIN PROGRAM 2018	X
16	DRC	BOKANGO-LONZO AGROINDUSTRIAL PARK 2017/2018	X
17	Chad		
18	Egypt	FARM LEVEL IRRIGATION IMPROVEMENT PROJECT 2018	X
19	Guinea-Bissau,	INTEGRATED PROG FOR DVPT AND CLIM CHANGE ADAPTATION IN NIGER BASIN (ABNI 2017/2018	X
20	Mali.	INTEGRATED PROG FOR DVPT AND CLIM CHANGE ADAPTATION IN NIGER BASIN (ABNI 2017/2018	X
21	Niger,	INTEGRATED PROG FOR DVPT AND CLIM CHANGE ADAPTATION IN NIGER BASIN (ABNI 2017/2018	X
22	Burkina	INTEGRATED PROG FOR DVPT AND CLIM CHANGE ADAPTATION IN NIGER BASIN (ABNI 2017/2018	X
23	Rwanda,	PROJET DE DÉVELOPPEMENT DE LA CHAINE DE VALEUR ARBORICOLE 2018	X
24	Sierra Leone,	ENABLE YOUTH / VALUE CHAIN PROGRAM 2018	X
25	Kenya	GREEN ZONES PROJECT PHASE II: A VALUE CHAIN DEVELOPMENT APPROACH TOWARDS FOREST CONSERVATION & FOOD SECURITY	X

Appendix 6: ***Deployment of the New Rice for Africa***

The development of the NERICA (New Rice for Africa) rice varieties by AfricaRice in the 1990s is lauded as one of the most significant advances in crop improvement in Africa. Every year, Africa imports one third of the world's rice, nearly 10 million MT; West Africa alone accounts for more than half of rice imports, 5.2 million tons. By 2020 an extra 17 million tons of milled rice will be required if domestic production continues to lag behind the ever-increasing demand. In 2003 the Bank approved a 5-year $34 million project to finance NERICA rice deployment in seven West African countries: Nigeria, Mali, Sierra Leone, Benin, Ghana, Guinea and the Gambia.

By the end of the project, NERICA rice farmers in each of the participating countries achieved significantly higher yields compared to their traditional rice varieties. Average yield in project areas was 2.80 MT/ha, with some farmers achieving up to 4.7 MT/ha; up from 1 MT/ha average yields on farmers' fields before the project. At the closing of the project, a survey suggested that over half a million hectares of NERICA rice varieties were grown in the seven target countries alone. NERICA won the U.S. Treasury's annual Development Impact Honors (DIH) in 2014 as one of the six high-impact and noteworthy projects that won out of a pool of 29 strong submissions. The DIH ceremony publicly recognizes outstanding projects undertaken by the multilateral development banks and showcases these effective success stories.

Appendix 7*: Description of seven of the nine priority technologies of TAAT*

Water Efficient Maize for Africa (WEMA)

Frequent droughts are a major element of climate change and persistent challenge to sub-Saharan African (SSA) agriculture, making farming risky for millions of smallholder farmers who rely on rain fed crop production such as maize, a major staple food crop for over 300 million people in SSA. The impact of drought resulting from climate change is threatening food security in most parts of Africa.

Various approaches have been identified to mitigate the impact of climate change including developing crops—for example maize—with enhanced adaptation to drought-stress and pest-outbreak. The adoption at scale using value-chain approach of such climate-smart crops by smallholder farmers can stabilize yields in the midst of climate change; and encourage the use of best agronomic practices, thus contributing to the urgent need to transform SSA agriculture from subsistence to agri-business.

TAAT will focus on one of the four different climate-smart technologies developed through the Water Efficient Maize for Africa (WEMA) partnership led by AATF in collaboration with other public and private sector organizations including CIMMYT, Monsanto Company, and the National Agricultural Research Systems of Kenya, Mozambique, South Africa, Tanzania, and Uganda.

Results from on-farm demonstrations showed that some of the conventional climate-smart technologies are increasing farm productivity by up to 75%. An average yield of 4 tons per hectare has been reported from these on-farm demonstrations, with an impressive adoption rate of 26% within only three years of deployment. The projected future adoption rate was estimated at 89% with about 65% of adopters being new farmers. This will help Kenya produce 74,000 tons per year, enough to reduce maize import by 15% annually.

Further investments of USD 25 million will be catalyzed through TAAT to take the conventional *DroughtTEGO*™ hybrid technology to scale across six countries (Malawi, Nigeria, Rwanda, Ethiopia, Tanzania, & Zambia) in SSA. It is estimated these technologies will benefit 6.2 million people from availability of 4,130 metric tons of certified seed targeted to be produced and sold within five years based on the experience described above.

Self-Sufficiency in Rice Production

Rice consumption in sub-Saharan Africa was approximately 26 million metric tons (MT) in 2014, with imports providing 13 MT, equivalent to about one-third of what is traded on the world market. African rice consumption is projected to reach 34.9 million tons by 2025, of which 12.6 million tons must be imported at a cost of about US$5.5 billion annually. African demand is growing as a result of African population growth, increased per capita consumption, and a shifting preference toward 'premium' rice linked to increased urbanization. The African rice sector has the potential to become an engine for economic growth across the continent. However, self-sufficiency in rice by 2025 requires the production of nearly 13 million additional tons or premium rice per year. This will improve the livelihood of at least 3 million producers and lead to economic gains of about US$5.5 billion per year among African countries.

African rice self-sufficiency can be accomplished through holistic mechanisms including but not limited to widespread distribution and commercial adoption of high-yielding, climate-resilient rice varieties; and the expansion of the SMART-Valleys approach. Also, the following technologies offer the potential for significant impact:

i) Information tools. Mapping tools are available to identify areas suitable to rice expansion and intensification including both flood and drought monitoring;

ii) Improved varieties;

iii) Accompanying technologies and innovations.

AfricaRice leads this Intervention in close partnership with IWMI. AfricaRice is part of the Global Rice Science Partnership that includes experience from Asia and Latin America. AfricaRice and other partners operate Innovation Platforms (IPs), including membership of youth and women, which can be out-scaled to national and regional levels. It is critical for TAAT to engage with the Bank and the private sector to accelerate the mechanization of rice production and processing. Partnering initiatives may include The Green Innovation Center, Grow Africa, WAAPP, and JICA-funded activities. Private sector participation is envisaged in quality rice seed production, marketing, and mechanization, fortification, packaging and branding. New higher value added products already include rice pasta and baby porridge.

Cassava for Industrial Use

Cassava grows very well in the Humid and Sub-Humid Zones, and also in dry semi-arid areas; it is the second most important source of calories in Africa after maize. An average increase of 7.93MT/Ha (or 70% increase) is required to fill the food demand gap for cassava by 2025. Many manufacturing industries are seeking to increase local content, thereby, creating a growing industrial demand for cassava. However, yields are low, average of 10MT/Ha due to the predominance of local varieties, diseases, pests, insufficient use of appropriate fertilizers and insufficient markets for cassava-based industrial products. Working with the private sector, TAAT will adopt a market-led approach to deliver technologies that will improve both the productivity and use of cassava in the food and industrial sectors.

Priority technologies to advance cassava revolution include:

i) Rapid large-scale multiplication of improved disease-resistant varieties using efficient propagation techniques such as mini-cuttings, tissue culture combined with Semi Autotrophic Hydroponics, and community-based clean planting material production and distribution systems;

ii) Improved fertilizer blends adjusted to local weather and soil conditions. Proven weed management and protocols for Integrated Soil Nutrient Management will be transferred to farmers, input and service supplier groups through training and technical backstopping;

iii) Technologies for mechanization, such as planters, harvesters, stem cutters, loaders, peeling, drying, milling, etc. will be introduced to increase production efficiency, reduce production costs and provide opportunities for the engagement of an innovative new generation of farmers;

iv) Value addition and processing innovations will be introduced to private sector entities comprised of at least 120 processor groups and 300 local entrepreneurs/processing site owners to process cassava into various products such as (a) high-quality cassava flour (HQCF) for wheat replacement in baked and confectionary products, for brewing and ethanol production, (b) chips and peels for formulating animal feed, (c) glucose syrup for use as a thickener, sweetener, candy and other products, and (d) starch for use in the pharmaceutical, food, textile, paper and packaging industries.

The expected impact includes cassava yields rising from 10.5 to 16 t/ha on nearly 2 million ha in the humid and sub-humid zones. In addition, production costs are expected to be reduced by about 25%.

Self-Sufficiency in Wheat Production

Wheat is grown on approximately 10 million hectares in Africa, producing around 24 million tons. Owing to its even stronger demand, wheat is an imported commodity in all African countries. Africa is the world's largest wheat importer at more than 40 million tons in 2014, at a cost of approximately costing about US$15 billion, and representing a third of the continent's total food import bill. Wheat demand is expected to increase by an additional 8.7 million tons per year by 2025, which means that without intervention wheat deficits will run to nearly 49 million tons per year. If nothing is done to stem this trend, 80% of all wheat consumed in Africa will be imported. A comprehensive management program designed by ICARDA, CIMMYT and its partners assists farmers to invest an additional $190 per hectare in improved seed and soil and water management increases average yields by as much as 4.4 tons per hectare.

Through the use of improved varieties and management practices, average wheat yields could increase to 4 to 6 tons per hectare across 9.8 million hectares. This would be through improved seed delivery systems and agronomic packages; a more effective extension system, and improved policy support. Overall production would double over five years and over 1.7 million farmers could move into commercial wheat farming.

A two-pronged approach for unleashing a wheat revolution in Africa would be carried out by first, bridging yield gaps in traditional growing areas of North Africa and African highlands through better varieties and soil and water management; and second by taking wheat "packages" to a new frontier in cool winter-irrigated environments, particularly in the Sahel.

Numerous technologies are ready for the assembly of innovative wheat production packages that include:

i) Popularization of ICARDA and CIMMYT's heat tolerant, disease and pest-resistant varieties.
ii) Practical and cost effective solutions such as raised-beds, supplementary irrigation, zero-tillage systems and the establishment of sustainable seed delivery systems.
iii) Mechanization based on local, low-cost manufactured machines (North Africa is an example).

NARES are critical partners in wheat expansion. Nigeria is particularly important to serve as a hub in bringing technology and skills to semi-arid wheat producers throughout West Africa.

Aquaculture

The aquaculture component of TAAT will support the development of the sector in order to promote economic diversification, food and nutritional security and sustainable employment generation, all of which are central priorities of Africa Governments. The development goal is to produce a domestic aquaculture sector which serves as viable and inclusive business opportunity through enhanced production and productivity to improve the livelihoods of beneficiaries along the aquaculture value chain. The aquaculture sector in Africa needs to build the capacity to delivery high quality disease-free fingerlings, improve access and availability of cost effective feeds and seek alternative value-adding opportunities post-farm gate to enhance value chain profitability.

The initial focus will be on Tilapia. The global Tilapia industry was valued at USD9.8B in 2015, with Tilapia estimated to be the second most farmed fish in the world. It is estimated that improvements from the WorldFish's breeding program, which commenced in 2001, contributes to approximately 50% of those improved Tilapia. As such, the TAAT aquaculture component will focus on three inter-related priority technologies, likely in Tilapia-based systems, to achieve this outcome:

1. Improving the **utilization and delivery high quality disease free fingerlings** (seed) for small-scale entrepreneurs to improve productivity and profitability. Breeding program have demonstrated a 6-10% productivity gain between generation, which when managed appropriately through ongoing breeding programs, hatcheries (which provide an alternative enterprise for small-scale producers) and grow out facilities deliver significant productivity gain at the production level. Importantly, disease management for the high quality fingerlings is critical.

2. Feed inputs into aquaculture production systems can be between 60-80% of overall costs. A key to support the growth of the sector is **improving access and availability of innovative, affordable and alternative feeds** for small-scale entrepreneurs. The development of feed alternatives also opens opportunities for entrepreneurial enterprises as feed supplies.

3. Seeking **value adding options and food product development** of fish-based products is a mechanism to improve overall value chain performance and provide entrepreneurial options and further employment. Importantly understanding market dynamics and consumer food preferences, and how these are changing are critical to the sustainable success of further value adding.

Key beneficiaries will be through the value chain, from input supplies (seed and feed), producers, postharvest handlers and value adders, and importantly consumers with improved access and availability to high-quality nutritious fish.

A current value chain analysis, supported by WorldFish, to be completed by December 2017, will provide additional insights to the impact of the priority technologies.

Sorghum/millet for the Sahel

Africa's Semi-arid Zone occupies 5.5 million km2 and supports a population of 239 million. Poverty is widespread with 53% falling below the poverty line of $1.25 per day. The natural vegetation across the Sahel and Sudanese Savanna is shrubby grassland. These lands are generally flat with over 16% converted to agriculture, but highly subject to severe drought, affecting both crops and livestock. Irrigated farming along major rivers is particularly important. Water harvesting and other climate-smart technologies have important application throughout this zone. Non-cultivated lands are often subject to over-grazing making integrated crop-livestock operations especially important. This zone is extremely fragile and subject to desertification and catastrophe, but at the same time its people are extremely resilient and prepared for innovative, labor intensive solutions in land management. The two agricultural value chains ready for scaling up in this zone are sorghum and millet.

Sorghum and millet production. Sorghum cultivation is extremely important in the Sahel owing to its greater drought tolerance than maize, occupying 15.8 million ha. Yields are low (0.8 ton per ha) owing to low planting density, widespread plant parasitism by *striga*, low adoption of fertilizers, even waterlogging following episodic heavy rains resulting in current annual production of 13.2 million tons per year. IFPRI projects the demand for sorghum across all of SSA to increase by 9.1 million MT by 2025. A comprehensive management program designed by ICRISAT that assists farmers to invest an additional $151 per ha in improved seed, water harvesting and Integrated Soil Fertility Management will increase average yields to 1.8 tons per ha and steadily reduce the infestation of *striga*, resulting in even greater mid-term gains. Livestock are critical to these farming systems and crop residues carry livestock through the long dry season, improved feed and health systems are needed from ILRI.

Millet farming is equally important to human welfare in the Sahel as it is the most important cereal grown in the drier portion of the Semi-arid zone, occupying 15.5 million ha of rotationally grazed lands. Yields remain low (0.7 ton per ha) owing to poor water management and weak adoption of ISFM, resulting in current annual production of 10.2 million tons per year. A comprehensive management program designed by ICRISAT and IWMI that assists farmers to invest an additional $151 per ha in water harvesting, wind erosion control and Integrated Soil Fertility Management will increase average yields to 1.6 tons per ha.

Small Ruminant Technologies

Small ruminants are particularly important in the dry regions of West Africa, the Horn of Africa, East and Southern Africa because of their ability to thrive in drier pastoral and agro-pastoral environments. With a growing demand for animal source foods, including small ruminant meat there is huge opportunity commercialize small ruminant production while creating employment for other value chain actors, especially young people. In these drier areas staple crops may provide food, but livestock like small ruminants provide income. Transforming small ruminant value chains requires introduction of improved genetics, health and feed technologies as well as the right enabling environment. Proven technologies for improved small ruminant production include:

i) *Thermostable vaccine for Peste des Petits Ruminants (PPR).* PPR is one of the most important transboundary diseases in small ruminants and can results in morbidity of up to 100% and mortality of 60-80%. Vaccines are available but need cold storage. The vaccine can be made thermostable so that it can be delivered without a cold chain. Mortality can be reduced by almost 100% with an overall increase in productivity of at least 30%. The Laboratoire Central Vétérinaire in Mali has recently produced about 300,000 doses of thermostable vaccine with the potential to scale up.

ii) *Improved feeding by better use of crop residues* through variety substitution and incorporation of nutrient value of crop residues in crop improvement programs. There are existing varieties of cereals (e.g. sorghum, millets, maize) and legumes (e.g. ground nut, cow pea) that can increase animal productivity by 20-30%.

iii) *Introduction of drought-tolerant forages.* Forages, such as herbaceous and/or tree legumes and grasses, can dramatically enhance livestock as well as crop productivity, while at the same time enhancing the system's resilience and reducing its environmental footprint. For example the introduction of new varieties of Brachiaria in Kenya, Rwanda and Mali have led to increases in productivity of 30-50%.

iv) *Improved small ruminant genetics though community breeding schemes*. Community-based breeding schemes can be used effectively to identify superior males for breeding within communities without the need for large scale investment in national breeding programs.

v) *Business models for fattening enterprises and feed processers*. Fattening of small ruminants can be highly profitable, especially when targeting high value markets (e.g. Easter, Eid). Packages are available that can be modified to different contexts to support these fattening enterprises.

vi) *Index-based livestock Insurance (IBLI).* IBLI has been developed in Northern Kenya and Ethiopia to increase the resilience of pastoral communities against drought, including a Sharia-compliant version. Studies show significant welfare benefits—insured households are 36% less likely to anticipate relying on distress sales of livestock and 25% less likely to foresee reducing meals to cope with drought.

Appendix 8 (a): *Grants' allocation by source and expenditure categories*

('000 **UA)**

LIST OF GOODS & SERVICES	ADF Grant			AGRA			BMGF			GOV			TOTAL		
	Local	Foreign	Total	Local	Foreign	Total	Local	Foreign	Total	Local	Foreign	Total	Local	Foreign	Total
A. GOODS															
1. VEHICLES	6,37	25,47	31,84	-	-	-	-	-	-	0,00	-	0,00	6,37	25,47	31,84
2. EQUIPMENT															
Standard Equipment	11,50	34,49	45,99	-	-	-	-	-	-	-	-	-	11,50	34,49	45,99
Specialized Equipment	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Subtotal	11,50	34,49	45,99	-	-	-	-	-	-	-	-	-	11,50	34,49	45,99
Subtotal	17,87	59,97	77,83	-	-	-	-	-	-	0,00	-	0,00	17,87	59,97	77,83
B. SERVICES															
Training	1 954,95	2 386,25	4 341,20	1 330,59	1 625,24	2 955,83	350,61	432,68	783,30	-0,00	-	-0,00	3 636,15	4 444,18	8 080,33
Technical Assistance	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Studies	1 317,19	3 951,56	5 268,75	-	-	-	-	-	-	0,00	-	0,00	1 317,19	3 951,56	5 268,75
Contractual Services	3 121,30	10 832,17	13 953,47	1 176,71	2 184,16	3 360,87	-	-	-	2 710,77	0,00	2 710,77	7 008,79	13 016,32	20 025,11
Audit	47,43	57,67	105,10	168,55	206,31	374,86	-	-	-	0,00	-	0,00	215,98	263,98	479,96
Subtotal	6 440,87	17 227,65	23 668,52	2 675,85	4 015,71	6 691,56	350,61	432,68	783,30	2 710,77	0,00	2 710,77	12 178,11	21 676,04	33 854,15
C. MISCELLANEOUS	1 130,83	925,22	2 056,05	-	-	-	-	-	-	-	-	-	1 130,83	925,22	2 056,05
D. PERSONEL	817,24	-	817,24	-	-	-	-	-	-	-	-	-	817,24	-	817,24
E. OPERATING COSTS	184,32	141,16	325,48	-	-	-	-	-	-	0,00	-	0,00	184,32	141,16	325,48
Unallocated	532,72	1 522,16	2 054,88	195,76	362,68	558,44	26,11	40,59	66,70	189,23	0,00	189,23	943,82	1 925,43	2 869,25
Total	9 123,84	19 876,16	29 000,00	2 871,61	4 378,39	7 250,00	376,73	473,27	850,00	2 900,00	0,00	2 900,00	15 272,18	24 727,82	40 000,00

Appendix 8(b): *Expenditure Schedule by Components and by Sources of Financing*

('000 UA)

PROJECT COMPONENTS	ADF Grant		AGRA		BMGF		Government		Total		For. Exch.	Local
	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%		
1. CREATION OF AN ENABLING ENVIRONMENT FOR TECHNOLOGY ADOPTION	6 871,86	55,9	3 591,41	29,2	850,00	6,9	970,13	7,9	12 283,41	30,7	7 655,03	4 628,38
2. REGIONAL TECHNOLOGY DELIVERY INFRASTRUCTURE (RTDI)	8 579,96	87,4	1 242,53	12,6	-	-	0,00	-	9 822,49	24,6	6 133,37	3 689,13
3. DEPLOYMENT OF APPROPRIATE TECHNOLOGY (DAT)	11 662,30	72,9	2 416,06	15,1	-	-	1 929,87	12,1	16 008,22	40,0	10 339,90	5 668,32
4. PROGRAM MANAGEMENT	1 885,88	100,0	-	-	-	-	0,00	-	1 885,88	4,7	599,53	1 286,35
Total PROJECT COSTS	**29 000,00**	**72,5**	**7 250,00**	**18,1**	**850,00**	**2,1**	**2 900,00**	**7,3**	**40 000,00**	**100,**	**24 727,82**	**15 272,18**

Appendix 9: *Eligibility to grant funding and cost-sharing exemption*

Criteria	Response in relation to TAAT
5.1 The paper proposes that projects must meet all the stage I criteria. This is based on the justification that the project has demonstrated that it addresses an issue or a product which is a core activity for regional development and integration, and which provides an environment for complementary investments while at the same time will be demonstrating the free riding issue. Stage II criteria will, in turn, help to prioritize the pipeline of the ROs in that the higher the score, the higher it would be on the priority list and vice versa.	TAAT meets all the Stage I criteria (**Non-rivalry**, **Non-excludability**, and **Of Public Interest**) for financing RPGs. How TAAT meets all these stage I criteria has been elaborated in Appendix 12. As also elaborated in Appendix 12, TAAT also meets all the Stage II criteria (**Multi-country involvement**, **Strategic Alignment**, **Catalytic and Upstream Role**, and **Higher Developmental Impact in Cooperating**).
5.2 While developing the ROs pipeline on a two-year basis, consideration will be given to regional and sectoral distribution of the RO investments and balance will be sought where possible. In the specific case of the RPGs, experience to date (August 2008) has shown that there is a high demand for such operations which fall within the priority areas of the Bank's vision and strategic directive. Grant resources for RPGs will remain limited. Prioritization of grant based RPG projects in the ROs pipeline will also be done on the basis of their readiness.	The TAAT operation clearly falls within the priority areas of the Bank's vision and strategic directive. This has been well elaborated in paragraphs 1.4 and 1.5 of the TAAT Program Framework document, among others.
5.3 Cost sharing exemption will be proposed only for those projects which demonstrate the best ranked eligibility to RPGs, as defined by the stage I and stage II criteria, including to Regional Economic Communities (RECs). Moreover, a specific component within a project may also be eligible for grant financing if that component can clearly demonstrate RPG eligibility. However, in the case of the latter, a component within a project may not be eligible for cost-sharing exemption if the implementation of that specific component falls in a loan eligible country, and/or is embedded as having revenue generating capacity. Financing in this case would be through the RO cost-sharing formula.	The activities planned to be funded with RPG resources in TAAT do not have revenue generating capacity. Besides, many of the 22 low-income RMCs targeted in TAAT's regional, agro-ecological and commodity belt focus are loan ineligible. Six (6) of them are fragile and conflict-affected states. This provides another strong reason for cost-sharing exemption in this initial phase of TAAT.
5.4 Remaining projects, even though qualified as Regional Public Goods would need to be financed according to the general principles laid out in the Regional Operations Framework, i.e. through cost sharing agreements with the recipient countries.	Not applicable for TAAT, at least the centrally managed activities.
5.5 Lower ranked operations to RECs or for which cost sharing agreements cannot be found would need to be taken out of the RO pipeline or postponed to the next ADF cycle.	Noted.
Grant resources outside the PBA allocation (i.e. exclusively from the RO envelope) will be considered for those projects which demonstrate superior developmental impact- with respect to economic and social advancement through amongst others, the following: employment generation, trade promotion, security improvement, gender equality and climate change and adaptation. The list of such projects will be determined by the ranking stemming from the rating assessed during the previous stage and endorsement by the Operations Committee.	The TAAT program will promote deployment and use of gender sensitive proven agricultural development technologies. It will promote agricultural innovations that reduce workload and hardship for women, increase their productivity and income. Program activities such as: (i) harmonizing/streamlining technology release and seed system policies across countries and regions (for spillover effects), (ii) capacity-developing weak seed systems, (iii) ensuring that improved crop varieties and livestock breeds for specific agro-ecological zones are widely applied/used, (iv) identifying and removing constraints to agricultural technology adoption through policy audits, (v) identification and selection of best-bet technologies for

	uptake by RMCs, (vi) design & develop campaigns for trans-national control of pests and diseases (and related awareness raising that pest and diseases do not respect political boundaries), (vii) deployment of appropriate technologies through crop/livestock campaign in RMCs, and (ix) design and implement wide-scale farmer extension and innovative models to organize farmers will trigger greater efficiency and additional production, processing and marketing of the target commodities. At full program development, the estimated additional tons of food will be realized, with its multiplier effects. Providing climate-proof varieties of the target crop commodities and improved breeds for small livestock and aquaculture to millions of farmers in program in the target low-income RMCs and beyond will provide them and consumers with food and other benefits. Congenial policies and institutional frameworks for profitable and sustainable value chains development of the strategic commodities as well as enhanced national and regional capacity in agricultural policy and institutional development work are expected. Rural populations in the target low-income RMCs are the primary beneficiaries of TAAT, expected to directly or indirectly benefit **individuals** (e.g. male farmers, female farmers, professionals, etc.), **groups** (e.g. farmers' groups, women, smallholder farm families, the youth, the private sector, policy makers, marketers/traders, transporters, and fabricators and small-scale agricultural machinery manufacturers, etc.), and **institutions** (e.g. NARES, CGIAR, FARA, AGRA, RECs, other players in agricultural development) in RMCs. The other beneficiaries are **inhabitants in the target low-income RMCs**, **consumers of target commodities**, **scientists** and **agricultural extension workers** involved in the project, and **all participants in the target commodities**. Other group beneficiaries include the **RMCs through improvements in the national economy** as a result of increased local production of target value chains. The program will thus contribute to enhanced food security in the target Bank's low-income RMCs. It will contribute to build innovative partnership with CGIAR, FARA, AGRA, NARES, RECs, and other relevant key players to expand and accelerate the pace and efficiency of delivering improved innovations to reach millions of direct beneficiaries (farmers, women/private sector processors, policy makers, NARES, NGOs, marketers, traders, commission agents, fabricators and small-scale agricultural machinery manufacturers, transporters, and the private sector) across the value chains. Successful implementation of the project will positively affect all participants in the target value chains and will result in a sustained increase in the production of the

	selected commodities. Given that many new enterprises will spring up along the value chain of the target commodities, this program is expected to create several new employment opportunities. This implies that the project will improve rural incomes while simultaneously promoting food security. For the farm households who will directly benefit from the intervention, about 50% extra income is estimated. Additional benefits will come from improved access to high yielding varieties (average yield increases of 20-50%) and improved agronomic, post-harvest, and processing practices. Numerous other benefits are contained in the Results-Based Logical Framework.

Appendix 10: *Bank Procurement Policy and Methodology (BPM) and Financial Management*

Bank Procurement Policy and Methodology (BPM)

Bank standard PMPs for contracts that are either: (i) above the thresholds indicated in Annex B5, Para. B.5.3;2, or (ii) in case Borrower Procurement System (BPS) is not relied upon for a specific transaction or group of transactions; and (iii) in case BPM have been found to be the best fit-for-purpose for a specific transaction or group of transactions, and using (a) the relevant Bank Standard Solicitation Documents (SSDs), (b) relevant Borrower Standard Solicitation Documents (SSDs), or (c) relevant Third Party Standard or Model Solicitation Documents (M/SSDs) that have been assessed as fit-for-purpose. The use of the Bank's Procurement Methods and Procedures (BPM) is justifiable considering that the participating institutions will be responsible for implementing components of the program rather than the countries within which they are located, the different procurement policies of the participating institutions which have not been assessed by the Bank, the substantial country risks due to the multinational nature of the intervention that involves countries with different jurisdictions and the highly prohibitive procurement practice risks identified. Going forward, the BPS might be progressively used after the Action Plan to address and remedy the identified risks has been implemented in a manner acceptable to the ADF. All contracts will be carried out using the Bank Procurement Methodology (BPM) in line with the Bank's October 2015 edition of the Bank's Procurement Policy framework, utilizing available Bank's Standard Solicitation Documents (SSDs).

Procurement Risks and Capacity Assessment (PRCA): The assessment of procurement risks at the Country, Sector, and Program levels and of procurement capacity at the Executing Agency (EA), were undertaken for the program and the findings have informed the decisions on the procurement regimes (BPS, Bank or Third party) being used for specific transactions or groups of similar transactions under the program. The appropriate risk mitigation measures have been included in the procurement PRCA action plan proposed in Annex B5, Para. A summary of planned procurements are presented in Appendix 8 for the Bank-financed activities. Overall responsibility for financial management including reporting and auditing, remains with IITA through the PMU and the Clearinghouse.

Financial Management

The Bank's assessment of the executing agency was limited to a review of the capacity of IITA to handle the financial management requirements of the project. The assessment concluded that the overall risk rating is Substantial due to the fact that the TAAT Project is largely decentralized to a number of participating countries; involves a number of partners and beneficiaries who may have limited fiduciary capacity, and funds will flow directly to Priority Intervention Area (PIA) accounts and reach participating partners and other beneficiaries. The assessment recommended the following mitigation measures: (i) recruitment of qualified financial management staff at IITA and at any national level institution that would need fortifying in financial management; (ii) recruitment of an independent external auditor for the audit of the project annual financial statements; (iii) recruitment of an internal auditor to facilitate fiduciary risk reduction and improve overall control; (iv) implementation of a financial information management system capable of consolidating the dispersed disbursements; (v) preparation and adoption of an administrative and financial procedures manual as part of the Project Implementation Manual; (vi) opening of special accounts at Executing Agency and Project Implementation Unit (PIU) level to ensure ready availability of funds when needed; (vii) technical audit for component 1 related to production, productivity and competitiveness.

The PMU (at IITA) and all Lead Centers shall operate robust accounting software that is IFRS compliant and capable of generating the required financial reports including consolidated financial statements. In terms of reporting, quarterly interim unaudited financial reports must be produced separately by the PMU and each Lead Center and transmitted to Bank within 45 days after the end of a reporting quarter.

Disbursement and funds flow arrangements: The Program will have access to all four disbursement methods (direct payment, special account/revolving fund, reimbursement and reimbursement guarantee) as in the Bank's Disbursement Handbook. IITA as the EA for the program will open a USD denominated Special Account as well as a Naira denominated account in a commercial bank acceptable to the Bank, to receive proceeds of the Grant. Similarly, the 6 CGIAR Centers and 4 Enablers will each open a sub-level USD denominated segregated Special Account as well as segregated local currency accounts in commercial banks in their localities that are acceptable to the Bank, to receive project related transfers from the EA (IITA). All project related disbursements will follow the requirements of the Bank's Disbursement Handbook.

External audit: An independent external auditor shall be hired by IITA, on terms of reference acceptable to the Bank, to carry out the audit of the entire program. The main independent external audit firm shall audit the PMU accounts and the consolidated financial statements that include the results of the PIU's level operations that will also, individually, be audited locally by local affiliates of the main independent auditor, or by local partner firms selected by the independent auditor for the purpose, in the absence of a local affiliate. All audits of the program shall comply with the Bank's requirements and terms of reference, as well as any other relevant accounting and reporting standards (like IFRS) as might have been agreed among the implementing entities. The EA shall transmit to the Bank the audited financial reports covering (i) EA program operations; (ii) the consolidated financial report; (iii) a copy of the audited financial statements from each of the PIUs; and (iii) a copy of the Management letter in respect of each set of financial statements submitted. The audit reports and applicable management letters shall be submitted to the Bank no later than six months after the end of each financial year audited.

Appendix 11: ***Summary of Procurement Arrangements (UA'000)***

PROCUREMENT CATEGORIES	Procurement Method			TOTAL
	INTERNATIONAL SHOPPING	CONSULTING SERVICES	OTHER	
A. GOODS				
1. VEHICLES	32,95 [32,95]	-	-	32,95 [32,95]
2. EQUIPMENT			47,58 [47,58]	47,58 [47,58]
B. SERVICES				
Training	-	8 768,06 [4 710,66]	-	8 768,06 [4 710,66]
Studies	-	5 639,40 [5 639,40]	-	5 639,40 [5 639,40]
Contractual Services	-	-	21 626,06 [15 096,50]	21 626,06 [15 096,50]
Audit	-	528,85 [115,80]	-	528,85 [115,80]
C. MISCELLANEOUS	-	-	2 185,08 [2 185,08]	2 185,08 [2 185,08]
D. OPERATING COST	-	-	354,78 [354,78]	354,78 [354,78]
E. PERSONNEL	-	-	817,24 [817,24]	817,24 [817,24]
TOTAL	**32,95 [32,95]**	**14 936,31 [10 465,87]**	**25 030,74 [18 501,18]**	**40 000,00 [29 000,00]**

Appendix 12: *Conditions associated with the Fund's intervention and Precedent to First Disbursement*

Conditions Precedent to Entry into Force

The Protocol of Agreement shall enter into force upon signature by the Bank and IITA on behalf of the CGIAR Centers.

Conditions Precedent to First Disbursement:

The obligation of the Fund to make the first disbursement of the Grant shall be conditional upon entry into force of the Protocol of Agreement, and the fulfilment by Bank and IITA on behalf of the CGIAR Centers, in form and substance satisfactory to the Fund, of the following conditions:

- Appointment of the Program Management Unit (PMU) with terms of reference, qualifications and experience acceptable to the Fund.
- Conclusion of Implementation Agreements, in form and substance acceptable to the ADF, between IITA and at least ONE of the implementing agencies (including AfricaRice,, ICARDA, IFPRI, ILRI, IITA, IWMI, , ICRISAT, and FARA), under which the proceeds of the Grant shall be on-granted. Disbursement will be made to only implementing agencies which have concluded Implementation Agreements with IITA.
- Submission of legal opinion(s), issued to the ADF by a legal counsel acceptable to the Fund, confirming that the Implementation Agreements between IITA and each of the implementing agencies have been duly authorized, ratified and executed on behalf of IITA and each of the implementing agencies, and constitutes legal, valid and binding agreements on both parties.

Other Conditions

IITA on behalf of the CGIAR Centers shall within six (6) months of the signing of the Protocol of Agreement:

- Open a Special Account in the name of the Program, denominated in USD, and a local currency denominated account, in a bank acceptable to the Fund, for the deposit of the proceeds of the Grant;
- Establish a Clearinghouse and appoint Key Management Officers comprising the Head of Clearinghouse, Partnership Engagement Expert, M&E Officer, Agriculture Outreach Expert, and Communications Officer; and Appoint key members of the Program Steering Committee (PSC).