TAAT Clearinghouse Establishment and First Year Operations

TAAT Clearinghouse

Clearinghouse Technical Report Series 003

TAAT Clearinghouse Establishment and First Year Operations

The Technologies for African Agricultural Transformation (TAAT) is funded through a grant from the African Development Bank and is implemented by the International Institute of Tropical Agriculture (IITA) in close collaboration with other centers of the Consultative Group for International Agricultural Research (CGIAR) and specialized institutions such as the African Agricultural Technology Foundation (AATF), the Forum for Agricultural Research in Africa (FARA) and the International Fertilizer Development Center (IFDC) and others. For more information, contact *Mp.Bokanga@cgiar.org*.

Front cover photographic credit: TAAT's sorghum and millet toolkit includes an array of new sorghum (upper left) and millet (top center) varieties; water harvesting (upper right) and fertilizer micro-dosing (lower left) are essential accompanying technologies; sorghum and millet are processed into nutritious foods. Crop residues are an extremely important organic resource throughout the Sahel.

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TAAT Clearinghouse Establishment and First Year Operations

Technologies for African Agricultural Transformation (TAAT) Clearinghouse Office, Cotonou, Benin

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This report describes the establishment and operations of the TAAT Clearinghouse as funded by the Bill and Melinda Gates Foundation during 2018. Any statements contained in this report are those of the TAAT Clearinghouse Office alone, and not those of the TAAT Program Management Unit and the individual TAAT Compacts. Questions and comments relating to this report should be directed to Dr. Mpoko Bokanga, Clearinghouse Manager, email *Mp.Bokanga@cgiar.org.*

1.0. Summary

A grant from the Bill and Melinda Gates Foundation (the Foundation) led to the rapid establishment and the effective operations of the Technologies for African Agricultural Transformation (TAAT) Clearinghouse Office in Cotonou, Benin during 2018. TAAT is a flagship program within the African Development Bank (AfDB) Feed Africa Strategy aimed at modernizing African agriculture through the advancement of agricultural technology in a way that improves the business of agriculture across Africa. The developmental objective of TAAT is to rapidly expand access of high yielding agricultural technologies to smallholder farmers as a means toward improving food production, assuring food security and raising rural incomes. The Clearinghouse is the body within TAAT that decides on which technologies should be disseminated. Moreover, it is charged to guide the deployment of proven agricultural technologies to scale in a developmentally- and commercially- sustainable fashion. The Foundation's Clearinghouse project is based upon three Primary Investment Outcomes, six Intermediate Investment Outcomes and twelve Investment Outputs that provide the main structure for this report.

The Clearinghouse Office was rapidly established based upon the readily available facilities from the IITA Station in Cotonou, Benin; the rapid acquisition of necessary equipment and supplies; and the timely recruitment of six experienced staff (Intermediate Investment Outcome 1.1). Clearinghouse governance included the establishment of an eleven-member Project Steering Committee (PSC) to provide guidance and oversight over TAAT program implementation (Intermediate Investment Outcome 1.2). A Clearinghouse inception workshop brought together the PSC, the Compact Leaders, the TAAT Program Management Unit, TAAT program coordinating team at the AfDB and some key stakeholders to achieve a common understanding of the vision, goals, objectives of the Feed Africa Strategy and the TAAT program.

The Clearinghouse developed a rapid and transparent review and recommendation process leading to the approval of the workplans of the nine Commodity Value Chain Compacts and six Enabler Compacts and their recommendation for funding by the AfDB. Funds from the Foundation enabled the Clearinghouse to play its role as an independent and fair broker during the technology selection, work plan formulation and approval process.

Selection of proven technologies and realistic dissemination mechanisms were important early contributions of the Clearinghouse to the TAAT process. The Clearinghouse pioneered a "Technology Toolkit" approach that allowed lead and accompanying technologies to be identified and clustered in manners that permitted productivity targets to be better achieved (Investment Output 2.1.1). It recognized that African small-scale farmers seldom specialize in only one commodity value chain, so it identified and explored opportunities for crosscutting interventions. It identified and prioritized the leading technologies (Investment Output 2.1.2). A summary of 47 technologies being championed through 15 Compacts in 28 countries through 396 partnerships is presented in this report.

The Clearinghouse also facilitated partnerships across TAAT. This service is important because while the fifteen Compacts are led by CGIAR Centers (eleven) and other Advanced Research Institutes (four), activities are conducted at national level (28 countries**)** by a wide spectrum of stakeholders (e.g. 262 private sector partners belonging to seven categories). So too, TAAT regards private sector participation as essential to the lasting deployment of proven, modernizing agricultural technologies and the expectations of businesses and investors that must be met. A strategy to communicate with these partners is being established and the mechanisms to reach different stakeholders are being put in place (Intermediate Investment Outcome 3.1). Admittedly, progress related to stakeholder reach is slower than expected, in part because it was uncertain to what extent the Clearinghouse was expected to manage the overall communication services of TAAT and its individual Compacts. Providing rationale for commercial and business benefits through agricultural technology support has also proven more difficult than expected (Intermediate Investment Outcome 3.2). This shortcoming is in large part because of delays in AfDB's disbursement of funds to Compacts, causing them to miss the growing season in many parts of Africa.

During 2018, Clearinghouse and Compact staff provided technical assistance to the AfDB's process of formulating agricultural development projects for its lending program by participating in 14 AfDB Missions relating to six compacts in eight countries, leading to the potential investment of $499 million in those countries This approach allows for the Clearinghouse and TAAT to orient agricultural investments far in

excess of the resources directly allocated to the program. Clearly, the one-year Support to TAAT Clearinghouse Governance was more an exploratory Proof of Concept than a solidly resourced investment by the Foundation. It investigated how well a small team of experienced professionals are able to catalyze the deployment and adoption of proven modernizing agricultural technologies available as both commercialized input products and extension-led management innovations. A next step by the Clearinghouse provides the rationale for the formulation of a robust mid-term strategy and a Phase 2 proposal (Intermediate Investment Outcome 3.3), both of which are summarized in this report.

2.0. Purpose of the Clearinghouse

TAAT is a flagship program within the AfDB's Feed Africa Strategy aimed at modernizing African agriculture through the advancement of agricultural technology in a way that improves the business of agriculture across Africa. Its developmental objective is to rapidly expand access by smallholder farmers to high-yielding agricultural technologies that improve their food production, assure food security and raise rural incomes. This goal is achieved by delivering regional public goods for rapidly scaling agricultural technologies across similar agro-ecological zones. This result is achieved through three principal mechanisms; 1) creating an enabling environment for technology deployment and adoption; 2) facilitating effective delivery of these technologies to farmers through a structured Regional Technology Delivery Infrastructure and 3) raising agricultural production and productivity through strategic interventions that include improved crop varieties and animal breeds, accompanying good management practices and vigorous farmer outreach campaigns at the AfDB's Regional Member Country (RMC) level. The important roles of sound policies, empowering women and youth, strengthening extension systems and engaging with the private sector is implicit within this strategy.

The Clearinghouse is the body within TAAT that decides which technologies should be disseminated. Moreover, it is tasked with the responsibility to guide the deployment of proven agricultural technologies to scale in a commercially sustainable fashion through the establishment of partnerships that provide access to expertise required to design, implement, and monitor the progress of technology dissemination campaigns. In this way, the Clearinghouse is essentially an agricultural transformation incubation platform, aimed at facilitating partnerships that reach millions of farmers with appropriate agricultural technologies.

3.0. Plan of Work and Necessary Adjustments

The Clearinghouse quickly assigned Investment Output responsibilities as described in the approved project document (OPP1179223) among its international staff. Briefly, the Clearinghouse Manager, together with the Administrative staff undertook the responsibilities within Investment Outcome 1, the Technology Outreach Officer led Investment Outcome 2 and the Partnership Engagement Officer led Intermediate Investment Outcome 3.1 (see Appendix 1). The Technical Adviser initiated the Internal Evaluation of TAAT Compacts for recommendation to the PSC. In this way, the pressing responsibilities before the Clearinghouse began to be addressed. Next, key information was extracted from the approved Compacts related to target technologies and the planned array of partners and stakeholders. The concept of both Technology Compacts (see Box 1) and Technology Toolkits (see Primary Investment Outcome 2) was introduced into TAAT by AfDB late in the formulation process and after the Foundation's Clearinghouse project was approved, so this required a shift in some staff responsibilities.

The Clearinghouse identified opportunities to better respond to the needs of smallholder farmers who always plant multiple crops in mixed cropping or in rotation. Agrodealers serving them also stock several technologies together. However, the work program of TAAT has been designed around Compacts focusing on a single value chain. As the Coordinators of the Maize, Bean, and Sweet Potato Compacts, and the Technical Adviser of the Youth Compact (ENABLE-TAAT) are all located in Nairobi, Kenya, the Clearinghouse encouraged the design of combined toolkits that agrodealers could supply at once. Negotiations were held with a network of agrodealers serving over 2,000 farmers in Western Kenya to package mixed technologies recommended by Compacts and have them deployed to their farmer clients, with the Compacts providing training and supervision. These interactions between Compacts to deliver technologies are being used by the Clearinghouse to demonstrate how in-country collaboration and coordination could be managed to create synergies between TAAT compacts.

Box 1. So what are TAAT Compacts and where are they going?

The element of Commodity Technology Delivery Compacts (full name of the "Compact") was added to the TAAT formulation quite late in its approval process by AfDB, and after the Foundation awarded its project to support the TAAT Clearinghouse, so it is no surprise that the concept is controversial and/or poorly understood. From the perspective of the Clearinghouse, a Compact is many things …

- A unit of implementation of the TAAT program based upon proven and related lead and accompanying technologies that are readily integrated into agricultural development efforts and agendas.
- The recognition among agriculturalists that potent agricultural technologies must not be allowed to stagnate or fall short of their realizable potential and a bridging mechanism for agents of development to better harness the process of technology refinement and dissemination.
- An open-ended opportunity for technology providers to buy into larger agricultural development agendas and to showcase technology products and know-how to potential investors and users through brokerage and commercial alliances.
- A coordination mechanism that offers a solution to the perennial problem of how to derive greater impacts among well-meaning parties by directing them toward a common purpose in a resource efficient manner.
- An opportunity for agricultural loan programs to be better strengthened by potent technologies and profitable rural enterprises in a way that guarantees and amplifies their expected success.
- A recognition of the unacceptability of the status quo, meaning different things to different interests as they push together in a loosely-understood but collectively-agreed positive direction towards win-win outcomes.

Although individual Compacts are coordinated by a CGIAR center or a specialized technical agency with expertise in the subject matter, a TAAT Compact is an entire ecosystem of actors engaged in a strategic partnership to deliver improved technologies and boost the productivity of an agricultural commodity value chain. The funding allocated to a Compact is transactional by covering the cost of advancing public goods, and in this way becomes a unit of developmental investment. Compacts may be added, merged and replaced as they progress. Every Compact is engaged and committed to putting in place activities, investments and processes that will result in a wide utilization of the promoted technology products and know-how. Governments and the private sector alike are realizing that these Compacts are expedient vehicles toward investing in the transformation of African agriculture!

At the same time, responsibilities toward TAAT Compacts started to be realigned between the TAAT Program Management Unit (at IITA HQ in Ibadan) and the Clearinghouse Offices in Cotonou and Nairobi. The Clearinghouse became responsible for TAAT Communication Services (as opposed to only Clearinghouse communications), Monitoring and Evaluation, and Value Chain Analysis. By April 2018, the AfDB revised the TAAT program's budget and awarded more resources to the Clearinghouse to accommodate the increased responsibilities entrusted to it. However, details of some of these activities, including the establishment of a robust Monitoring, Evaluation and Learning System and related Key Performance Indicators, are not covered in this report to the Foundation but are otherwise available through Clearinghouse reports and publications.

4.0. Primary Investment Outcome 1. Establishment of the TAAT Clearinghouse Office

"During 2018, a Clearinghouse office will be established in Cotonou, Benin for the purpose of providing technology advisory services to the Technologies for African Agricultural Transformation Project and the African Development Bank's Feed Africa Program."

Investment Intermediate Outcome 1.1: *By March 2018 the Clearinghouse office in Cotonou is equipped, staffed and begins operations, and Liaison Office in Nairobi established.*

The Clearinghouse office started operations on 1 February 2018 with the arrival of Clearinghouse Manager. Office facilities were provided by IITA at its Benin Station at Abomey-Calavi in Cotonou. Over the followingfew months, additional staff was recruited and offices equipped. A Liaison Office was also established in Nairobi, Kenya with some Clearinghouse staff located there.

Investment Output 1.1.1:"Clearinghouse Manager appointed, two professional staff (Technology and Partnership Officers) recruited and three national staff selected (Executive Assistant, Administrative Assistant and Driver)"

A team of professionals was assembled to staff the Clearinghouse in Cotonou and Nairobi. These staff are often complemented with consultants recruited for short periods and for specific assignments. The following regular staff are funded through this BMGF grant.

Clearinghouse Manager. The Clearinghouse is managed by a Manager posted in Cotonou, Benin. This post is funded through the BMGF grant. Responsible for forward planning. Reports to the Project Steering Committee and relays key information for project implementation to the TAAT Program Management Unit for onwards transmission to the AfDB. Posted in Cotonou.

Technology Outreach Officer. Compiles and assesses candidate technologies and their "toolkits" for scaling up. Coordinates the formulation of Compacts' work plans and monitors technical implementation of their activities. Serves on the Technical Review Committee. Works closely with the Technical Adviser. Posted in Cotonou.

Partnership Engagement Officer. Liaises with all Compact Leaders to ensure balanced partnership across TAAT. Liaises with other organizations aligned to TAAT. Responsible for Program advocacy. Serves on the Technical Review Committee. Posted in Cotonou.

Technical Adviser. Seconded 50% from the IITA Director General Special Programs Office. Advises on implementation and appraisal of agricultural technology dissemination field campaigns. Serves on the Technical Review Committee. Prepares technical proposals for new activities to be undertaken by the Clearinghouse. Leads the Quick Wins Technical Missions. Posted in Nairobi.

Program Officer. Assist the Clearinghouse Manager with the follow-up, supervision, monitoring and impact assessment of TAAT program activities and coordinate contacts between the Clearinghouse and the program stakeholders, especially decision makers in RMC governments, development finance institutions and opinion makers. Posted in Cotonou.

Technical Assistant. Assists the Technical Adviser and the M&E Specialist. Compiles databases related to country baselines and Program monitoring, and assists in their interpretation. Collects data for technology toolkit description. Assembles partners' reports. Edits Clearinghouse documents and proposals. Assisted in the Quick Wins Technical Mission. The volume of work is excessive; a separate Technical Assistant for M&E is being recruited on the AfDB grant. Posted in Nairobi.

Administrative Assistant. Conducts day-to-day administration of Clearinghouse activities. Ensures that Program administration complies with IITA policies. Posted in Nairobi.

More Clearinghouse staff were recruited through the AfDB's grant for the TAAT program and their activities also contribute to Foundation's investment and Clearinghouse's outputs. These staff include: a M&E Specialist, an Agricultural Value Chain Specialist, a Communication Specialist, an Accountant, an Executive Assistant, and a Clerk/Driver. None of these additional staff were held directly responsible in achieving the Investment Outputs of this Foundation project but all contributed to it.

Investment Output 1.1.2: Capital equipment purchased (vehicle, computer work stations and office furniture) and full telecommunication facilities installed.

The Clearinghouse purchased one official vehicle used for running office-related errands, as well as transporting Clearinghouse personnel to various meetings and official appointments in and around Cotonou, Benin and to Ibadan, Nigeria. Landline phones were installed in each of the offices. Laptops, office desks, chairs and other office furnishings were procured and provided for each staff member to facilitate their activities and responsibilities. A heavy duty office printer/copy machine was set up in a common workroom and four desktop printers were also purchased and installed in individual offices. A medium-sized boardroom table with eight chairs was procured and a small conference room set up for hosting staff meetings as well as small external meetings. The process for procuring conference calling equipment, projection screen and other necessary audio visual equipment is underway. In addition to improving station facilities, generators were installed in the homes of all international staff and Wi-Fi internet service provided to enable working at home during evenings and weekends.

Intermediate Investment Outcome 1.2: *Establish collaborative structures that guide and inform Clearinghouse Governance.*

The first assignment of the Clearinghouse Manager was to establish the TAAT Program Steering Committee (PSC) according to the profiles provided in the AfDB's TAAT Program Framework Document

and identified candidates were officially invited to join the PSC by the Director General of IITA. The eleven members (out of which five are women) include a Minister of Agriculture, Director Generals of NARES institutions, an agribusiness CEO, a Director from the African Union Commission's Department of Rural Development and Agriculture, an expert in African agricultural development, a leader of an advocacy group for women's leadership in agriculture, the Executive Director of one of the sub-regional organization for agricultural research, a young farmer active in her national farmers' association, and two representatives of CGIAR centers.

Investment Output 1.2.1: Clearinghouse Steering Committee (SC) selected and SC Chair develops first agenda for committee consideration. Clearinghouse Manager serves as Secretary to the SC Operations of the Program Steering Committee.

The selected members of the PSC were provided with necessary Program documents. The first meeting of the PSC took place on 27-28 March 2018 in Cotonou, Benin at the inception workshop of the Clearinghouse. The first action of the PSC was to establish a governance structure including election of a Chairperson and two Vice-Chairpersons. The first order of business of the PSC was to review the PSC TORs and several amendments were made. It decided that the two CGIAR center representatives and the Clearinghouse Manager serving as Secretary to the PSC would have no voting rights on the committee and that the IITA representative would be a permanent representative while the second CGIAR representative would rotate on an annual basis between other Compact implementing agencies.

The technologies advanced through TAAT resulted from a careful vetting process. Previously, IITA staff had reviewed a wide range of technologies and identified those ready for scaling. Institutions whose technologies were selected were then offered the opportunity to assemble partner institutions into Commodity Technology Delivery Compacts, draft proposals for interventions and prepare work plans and budgets. The Clearinghouse started operation from this point and received the proposals and work plans from the Compacts. It commissioned both in-house and external reviews of Compact applications and forwarded its recommendations to the PSC. It also recommended budget allocations to the Compacts. The list of technologies disseminated during the first year of TAAT is presented later in this report.

Investment Output 1.2.2: Organize and conduct a Clearinghouse Inception Workshop to formalize working relations with TAAT, its technology providers (nine), its four (now six) Enablers and AfDB Officers

An Inception Workshop was conducted in conjunction with the first PSC meeting on 27-28 March 2018 in Cotonou, Benin. It was attended by 44 participants including three AfDB officers assigned to TAAT, the AfDB Representative in Benin, a representative of AGRA, the Executive Director of FARA, the Manager of the TAAT PMU and the Leaders of the 15 TAAT Compacts. The AfDB Director of the Agriculture and Agroindustry Department presented AfDB's vision of TAAT to the PSC within the context of the AfDB's Feed Africa strategy. The Manager of the TAAT PMU described implementation arrangements. Each Compact Coordinator explained the objectives, partnership arrangements and expected results from their Compact. Following these presentations, the PSC provided specific guidance toward finalization of the Compact work plans and budgets. Thus the TAAT Program and its Clearinghouse operations were born.

5.0. Primary Investment Outcome 2. Technology Advisory Review

"By June 2018 the Clearinghouse issues its first round of technology advisory reviews for TAAT Tier 1 commodities".

During 2018 a wide assortment of TAAT technologies were reviewed, including their assembly into toolkits of accompanying technologies necessary to meet production targets. This process required more time than anticipated however because delays in Compact funding resulted in missing the crop growing seasons in West Africa and the Sahel. Nonetheless, many important insights into technology dissemination were gained.

Intermediate Investment Outcome 2.1:*By June 2018 a first round assessment and mapping exercise of TAAT Tier 1 commodities is concluded.*

Investment Output 2.1.1: A compilation of candidate technologies is assembled for review by the Clearinghouse Technology and Partnership Officers and criteria for further action established.

This Investment requires the Clearinghouse to document the identification, promotion and dissemination of proven technologies and management innovations across TAAT Compacts. The approach employed involves understanding the assembly of Technology Toolkits by the Value Chain Compacts. The principle of designing and deploying Technology Toolkits is established within the framework of TAAT as a mechanism to extend cohorts of proven technologies to African farmers. Toolkits are defined as *"an assemblage of proven core technologies needed to close productivity gaps that are mobilized during country-level technology deployment but then interpreted and advanced within a wider developmental context".* They are necessarily holistic. For example improved crop varieties alone are not able in themselves to increase yields without accompanying technologies related to soil fertility, pest control, and water management. The same holds true for animal breeds without veterinary services and improved feed systems. Toolkit composition begins with proven production inputs and management innovations, but also operates along the entire commodity value chain in a transformative manner.

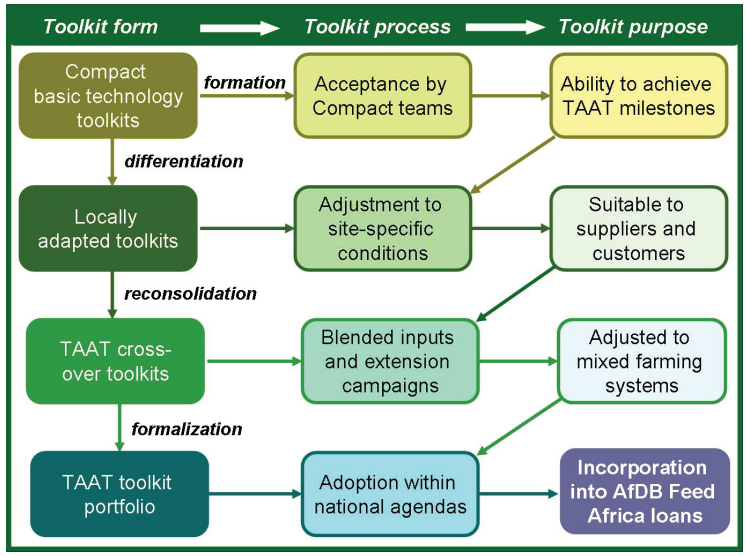


Figure 1. Toolkit formulation, adaptation and purposing.

While the process of monitoring individual toolkit performance remains the responsibility of TAAT's Value Chain Compact teams that formulate and adapt them, the task of evaluating them as a holistic and crosscutting process falls upon the TAAT Clearinghouse. Toolkits evolve from their basic formulations at the Compact level, differentiate across site-specific conditions, consolidate as they are combined to suit the needs of farming communities, and become formalized as they are promoted and advanced within country programs and development agendas (Figure 1). The Clearinghouse evaluation process tracks toolkits as they are adapted and deployed across countries in a way that allows for lessons to be learned and distributed across agro-ecological zones, levels of agricultural intensification and socio-economic setting. It provides guidelines to the individual Compacts to ensure commonality of monitoring tools through the development of a Performance Monitoring Plan through four sequential toolkit steps (Figure 1). This plan includes clear indicators of process and purpose, participatory methods, and standardized data collection. Similarly, TAAT Enabler Compacts receive performance monitoring tools that clearly identifies which toolkits they assist and in what ways. The toolkit approach itself greatly facilitates documenting TAAT's progress as a whole because it captures the availability of proven technologies and their successful deployment in terms of their relationship to the Regional Technology Development Infrastructure. Indeed, toolkits and their widespread adoption provide the basis for transforming African agriculture through TAAT, an opportunity described more fully in Clearinghouse Technical Report 2.1.2.

Investment Output 2.1.2: At least 45 specific proven technologies are assembled into portfolios and recommended for promotion through TAAT campaigns in at least 10 Transformation Areas (or countries).

Technology portfolios forms the bridging mechanism between TAAT Program operations and agricultural development agendas, particularly the recently-established AfDB's Feed Africa strategy and Regional Member Countries' national agricultural investment plans. They also shape the collaboration with the private sector as input manufacturers, distributors, and agro-industrial food processors. They provide the substance for partnering agricultural extension activities at national levels, and their promotion offer direct incentives to farmer organizations and commodity producers to work with the individual Value Chain Compacts. In this way, these toolkits span all aspects of the TAAT Program as their composition and

Table 1. A summary of the 47 technology sets being disseminated in 28 countries[a,b].

Rice: *Six technology sets in 12 countries*; 1) improved rice varieties (Advanced Rice varieties for Africa, New Rice Varieties for Africa, aromatic and hybrid rice varieties), 2) improved crop nutrition (soil and foliar diagnostics, localized nutrient targeting), 3) Rice Advice and Good Agricultural Practices (and other IT products), 4) Rice Mechanization (laser land leveling; motorized weeding; axial flow thresher), 5) irrigation services and scheduling (improved access and lifting of water, irrigation network management), 6) rice processing and products (parboiling, biomass gasification, fortified rice-wheat composite flour and products, mineral- and vitamin- fortified rice products, rice-based pasta).

Wheat: *Four technology sets in 7 countries;* 1) improved varieties and seed systems (high yielding, heat tolerant, disease resistant, accelerated seed multiplication and delivery), 2) mechanization (planters and harvesters), 3) improved water management (irrigation systems, water harvesting, raised beds), 4) value addition leading to reduced importation of wheat-based products (flours, pasta, other products).

Maize: *Five technology sets in 13 countries;* 1) improved varieties and seed systems (drought tolerant, improved nutrition, disease and pest resistant, striga tolerant, imazapyr resistant), 2) integrated management (fertilizer blends, conservation agriculture, rotation, striga elimination, ISFM and Good Agronomic Practices, 3) mechanized production (tillage, irrigation and harvest), 4) aflatoxin management (aflasafe, quality control systems), 5) quality protection and post-harvest storage.

Sorghum and Millet: *Six technology sets in 7 countries;* 1) improved varieties (varietal release, community-based seed production), 2) water harvesting (pits, contour and tie ridges), 3) ISFM (fertilizer micro-dosing, legume rotation), 4) pest management (striga elimination, midge control), 5) residue management (feed systems, choppers, stalks), 6) value addition (milling, whole grain substitution).

Cassava: *Six technology sets in 15 countries;* 1) six improved varieties, 2) cassava ISFM (improved mineral fertilizer application, adjustment to local and weather conditions, staggered planting practices, intercropping), 3) cassava pest and disease management, 4) mechanized production (planters, weeding and harvest lifters), 5) improved cassava processing (village-scale operations, mechanical peeling and drying operations, cassava root waxing), 6) improved cassava products (High Quality Cassava Flour and products; industrial cassava starch; new cassava-based foods, cassava peels as animal feed and granular carriers within Aflasafe production).

Orange-Fleshed Sweet Potato: *Six technology sets in 12 countries;* 1) improved variety release (firmer flesh, drought tolerance, disease clearing), 2) vegetative propagation systems (vine multiplication systems, handling and marketing), 3) management systems (raised beds, small-scale mechanization, specialized fertilizer blends, organic resource management), 4) IPM (virus reduction, field sanitation), 5) feed systems (fodder, silage), 6) value addition (puree, baked goods, snacks).

High Iron Beans: *Five technology sets in 8 countries;* 1) improved varieties and seed systems (both bush and climbing types), 2) ISFM (specialized fertilizer blends, organic resource management, crop rotation and intercropping), 3) seed coating and rhizobial inoculation (inoculant manufacture and distribution), 4) small-scale mechanization (tillers, planters and weeders), 5) marketing and processing (textured vegetable proteins, fortified flours, feed production).

Fish Farming (Aquaculture): *Five technology sets in 9 countries;* 1) improved breeds and hatcheries (GIFT tilapia, YY catfish, cost effective hatcheries and fingerling distribution), 2) improved production systems (pond-, cage- and tank-based systems), 3) improved feed production (growth-staged feeds, increased protein and improved buoyancy), 4) water quality control, 5) processing (refrigeration, freezing, drying and smoking).

Poultry, Sheep and Goats: *Four technology sets in 6 countries;* 1) improved breeds and rearing facilities (disease resistance, layers, broilers and dual purpose, chick, lamb and kid survival), 2) cost-effective housing, production and marketing systems, 3) vaccine technologies and veterinary service delivery, 4) improved feed formulation, processing systems, and goat and sheep fattening.

[a] Note that Enabler Compacts' technologies are embedded within the dissemination campaigns of partnering Value Chains.

[b] See Appendix 2 for distribution among countries.

advocacy require an Enabling Environment, their widespread mobilization relates to the Regional Technology Delivery Infrastructure, and their refinement, local adoption and wide-scale use are the main goals of Technology Delivery. A list of 47 transformative technologies organized by the nine Vale Chain Compacts appears in Table 1. Note that the Compacts are ordered as cereals – root crops – grain legume – fish and small livestock commodities so that complementarity among modernizing technologies are more apparent. Also note that technologies championed by the Enabler Compacts, particularly the Emergency Response to Fall Army Worm (FAW), Soil Fertility and Water Compacts, are embedded into the efforts of their nine partnering Value Chains.

But this approach to technology dissemination is not without challenges and shortcomings. The toolkit concept was included late in TAAT conceptualization process and has not been fully understood and embraced by all. Two tendencies run contrary to the fullest development of TAATs toolkits; “technology ivory tower” and “silver bullet” approaches. The former is exhibited by partnership cliques that fail to recognize the important contributions of alternative technologies that were developed by "outsiders" and are beyond their immediate control. This shortcoming results in less potent toolkits advanced within more confined networks formed prior to the establishment of TAAT. The latter “silver bullet approaches" result when Compact activities focus primarily upon a single emergent technology rather than including the accompanying technologies necessary to realize their larger objectives. This case appears for example when campaigns advancing improved crop varieties are conducted that do not include the appropriate fertilizer, weed control and pest management technologies ensuring their success. It also results in skewed alliance to NARES and the private sector where national seed programs and seed companies are viewed as more important than the agrodealer networks that serve as "last mile" suppliers of balanced input products composing the toolkits themselves. In fairness, TAAT is a new approach and its Compact leaders were required to quickly assemble their technical and institutional resources, and standard guidelines were not issued on how they could best proceed with toolkit design. The consequences of this pragmatic strategy is now under assessment by TAAT's Monitoring and Evaluation team and corrective measures will be formulated for TAAT Compact Leaders, partners and stakeholders.

6.0. Primary Investment Outcome 3.

“By December 2018, the Clearinghouse develops and validates a plan for stakeholder buy-in and commitment sharing over the larger TAAT Project lifetime”

Intermediate Investment Outcome 3.1: *Communicate Clearinghouse rational and outputs to TAAT stakeholders.*

Between February and September 2018, the Clearinghouse established an office and governance structure, recruited staff, reviewed Compact work plans and budgets, and saw them approved by the Program Steering Committee. As Program funds became available in June 2018, the Clearinghouse supervised the launch of these 15 Compacts in 28 countries (see Appendix 3). These achievements were conducted in rapid succession, but starting September 2018 more time was available to advance Clearinghouse rationale and approaches from a more strategic context. Clearinghouse staff participated in the 2018 African Green Revolution Forum in Kigali, Rwanda (7 September 2018). Interested parties were invited to a TAAT Breakfast meeting which was attended by 126 participants immediately before the Heads of State Summit. Supportive statements were made by Ministers of Agriculture of Togo and Malawi, an AGRA Vice-President, and high-level officials from IFAD and FAO. In this way, the Clearinghouse started to align its strategy to other investments in African agricultural development (beyond the Foundation and AfDB) including those of AGRA, the World Bank, IFAD, USAID, DfID, and the European Union. This process remains ongoing and is reaching out to other investors in African agricultural development such as GIZ, Sasakawa Africa Association, the Syngenta Foundation, etc.

Investment Output 3.1.1: Design and execute a comprehensive communication strategy to effectively disseminate the goals, activities, and benefits of the TAAT Clearinghouse.

Progress towards the formulation of a Communication Strategy (Investment Output 3.1.1) has been slower than expected and has led to some missed opportunities to highlight achievements of the Clearinghouse and TAAT program. Finalizing and following this strategy has become highest priority. Clearinghouse staff have been tasked, with immediate effect, to prepare briefs and updates in the areas of technology opportunities, partnership management and value chain development that are suitable for dissemination on electronic and print media. Furthermore, additional articles or posts will be solicited from other TAAT partners, starting with the Compact Leaders. Communication tools that will result from this adjusted focus include the following:

1. Production of a series of TAAT brochures, starting with one that describes the purpose and operations of TAAT intended for a wide range of partners and stakeholders, and to be followed by other more specific topics.

2. Production of a quarterly TAAT Update newsletter for release in both printed and electronic formats. The focus of this newsletter is to highlight technology dissemination activities and their impacts. This information will be supplemented with a weekly post available through electronic media.
3. Publication of an Annual Corporate Report that captures key success stories and promotes TAAT to the wider developmental community, featuring both technology dissemination strategies and solid example as case studies.
4. The establishment of a functional website that covers all of TAAT's activities instead of a site that covers developments only from the Clearinghouse perspective.
5. Stronger presence must be achieved across a wide range of social media, both those managed by TAAT and its partners as well as strategic posts into those operated by others. The youth operating ENABLE TAAT have considerable expertise in this area and will be called upon for assistance.
6. Production of branding materials such as calendars, letterhead papers, etc. but this is lower priority and will be funded by sources other than the Foundation.

These materials are particularly important for distribution during Technical and Supervision Missions and at international fora where TAAT itself is not well understood. In many cases, important information has been assembled but is not being sufficiently processed for distribution to wider audiences, and this shortcoming is being addressed. It was also determined that greater reliance upon the professional communication services offered by IITA Headquarters is required.

Investment Output 3.1.2:Establish Clearinghouse website with linkages to all TAAT partners and other social media.

The *www.taatclearinghouse.org* domain was secured early in 2018. An unexpected development occurred when the TAAT Program Management Unit assigned website responsibilities to the Clearinghouse, rather than expecting the Clearinghouse to regularly contribute to one managed from IITA Headquarters as earlier agreed. This domain was abandoned in favor of *www.taat-africa.org*. The building of the website was procured following AfDB procedures. A prototype of the website went up on 31 January 2019 and its content is being reviewed before the official launch. Once live, all key events relating to TAAT will be posted and each Clearinghouse officer and TAAT Compact will contribute to a web page within that site. The website is also expected to host electronic fora on TAAT technologies and their adoption at national levels.

Intermediate Investment Outcome 3.2: *Provide rationale for commercial and business benefits through agricultural technology support and demonstrate their positive socio-economic and macro-economic outcomes.*

Investment Output 3.2.1: Identify conducive policies for governments and regional agencies to act upon and establish and monitor Key Performance Indicators of agricultural transformation.

The Clearinghouse made significant gains in identifying which policies are needed to advance modernization of African agriculture. A stepwise, consultative procedure was followed. First, the Compact Leaders were asked to complete a form that identified likely policy constraints to the dissemination of their technology toolkits. In total, 93 constraints were submitted by eleven of 15 Compacts. Next these responses were compiled, and constraints that lacked a clear policy dimension were removed, and constraints offering similar solutions combined. This approach produced a "policy response" short list as follows:

1. Reduce restrictions to cross-border trade of agricultural inputs and improved animal breeds.
2. Remove import duty and VAT on farm inputs and equipment, and enforce current exemptions.
3. Streamline agro-input dealer accreditation frameworks while ensuring customer protection.
4. Assure protection of property rights to plant varieties and agricultural biotechnologies.
5. Introduce quality control n for vegetative propagation products.
6. Reduce the time and costs of variety registration and release of new pest control products.
7. Streamline regulations for interim registration of pesticides needed to counter biological invasions.

8. Offer incentives to the greater availability of livestock health products.
9. Extend quality assurance to purchasers of livestock feeds.
10. Include aquaculture construction materials within import duty and VAT exemptions.
11. Provide domestic producers market protection from imported commodity dumping.

At the same time, a framework for policy response is being developed (Figure 2). Briefly, policy response operates at three levels: through regulation, legislation and regional action. Also, policy leverage may be applied by either progressive transformation or through eliminating counterproductive and outdated measures. In many cases, regulatory agencies merely need to alter the manner in which their mandate is interpreted, thus providing simple and rapid leverage. An example of this is when pesticide registration requirements were eased in some countries (but not others) in response to the recent, ominous biological invasion of the Fall Armyworm. Another example is when the excessive delays in clearance of duty free agricultural inputs are corrected. Yet another example is the flexibility with which regulators can offer accreditation to input suppliers, often through easing restrictions on which products may be offered and how, but managed in a way that affords quality assurance and user safety.

Often however, policy leverage rests through legislation that assigns or adjusts the mandates of national regulators. For example, legislation is often needed on tax relief, protection of intellectual property, and movement of needed technologies across common borders. So too, perverse policies that relieve duties to large farm equipment, such as tractors, but not to smaller equipment such as hand operated power tiller and weeders must be reconsidered. At the widest scale, policies are best initiated or improved through regional organizations. Without going into detail, the Clearinghouse has contacted many Regional Organizations and participated in high-level regional fora in manners that highlight the policy dimensions of agriculture technology dissemination, particularly less restrictive movement of farm input products and commodities along established trade corridors.

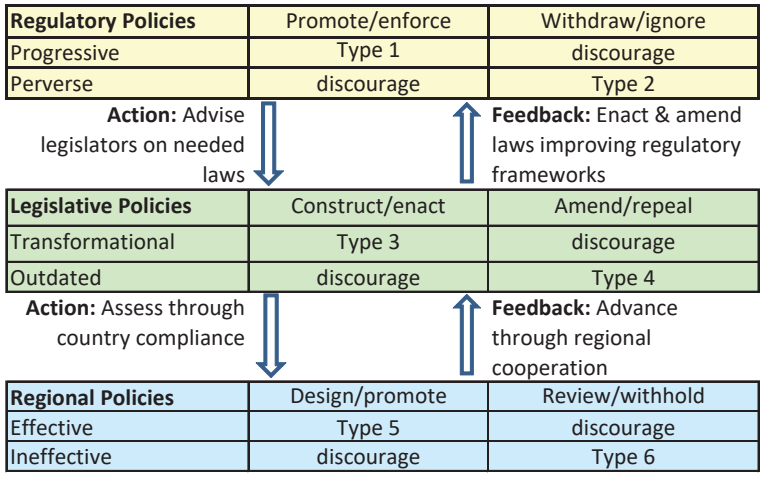


Figure 2. A hierachial framework for policy assessment and intervention.

This hierarchical model is being explored with the Policy Support Compact to better identify policy interventions based upon their arena (regulatory, legislative or regional), their potency (e.g. effective or perverse) and recommended action (e.g. promote or withdraw). Clearly, the different policy needs listed above may be readily assigned to one or more of these categories. The next step is to enlist the individual Compacts to engage in policy dialogue as the above short list and other opportunities are applicable to them. For example, this model appears immediately applicable to assist in the emergency response at national and regional levels to the biological invasion of cropland by FAW by fast tracking new bio-rational products that are effective on caterpillar pests.

Investment Output 3.2.2: Contribute to at least 10 AfDB Missions that advance loan preparation within the Feed Africa Strategy in a manner that mobilizes TAAT's proven technologies, and results in more cost- and time-effective agricultural transformation.

The Clearinghouse exceeded Investment Output 3.2.2 and greatly improved upon its original purpose in a manner that assists the design of in-country activities. Clearinghouse and Compact staff participated in 14 AfDB Missions in eight countries leading to the potential investment of $499 million in AfDB loans.

This approach allows for the Clearinghouse and TAAT to influence agricultural investments far in excess of what is available through their available resources.

In addition, the Clearinghouse assisted in organizing three workshops that assisted the AfDB to shape its proactive agenda toward the fertilizer industry, the biological invasion of Fall Armyworm, and opportunities for lending to small-scale commercial farming enterprises.

1. A workshop was initiated by the AfDB and organized by the Clearinghouse to identify ways that TAAT, The African Fertilizer and Agribusiness Partnership (AFAP) and The Africa Fertilizer Financing Mechanism (AFFM) could work together to accelerate fertilizer access by millions of African smallholder producers. This one-day workshop was titled "Mobilizing the private sector for fertilizer delivery to farmers through TAAT" and conducted in Cotonou, Benin on 12 June 2018. It proposed modalities for businesses engaged in TAAT to better meet their roles of producing, blending and distributing fertilizers and other inputs. Representatives from all TAAT Compacts attended and some valuable linkages to the fertilizer industry were forged. For example, immediately after the workshop a new fertilizer blend for root crops was designed by TAAT partners and entered into commercial production.
2. Between June and October, the AfDB and TAAT organized a series of sub-regional Partnership Meetings on FAW for East, Southern and Central/West Africa. The Clearinghouse played a particularly important role within the meetings as this was the opportunity to align national programs to the FAW Emergency Response Enabler Compact, but the Compact itself had not yet been launched because CIMMYT withdrew from the leadership of the Compact in June 2018. Subsequently the Clearinghouse assisted countries by sharing the FAW proposal templates used for loan application from the AfDB to combat the menace. In the loan application process, the Clearinghouse played the critical role of linking countries to the appropriate contacts for successful loan application as requested by countries. Two important technology toolkits emerged from these meetings, Fortenza Duo seed treatment and the FAW rapid curative response. Through these meetings the TAAT and the Clearinghouse emerged as new leaders in technology dissemination and collaborative scaling.
3. In July 2018, the Clearinghouse organized a two-day business meeting between each Compact Coordinator and two of their implementation partners with NIRSAL, the Nigerian Incentive-based Risk Sharing System for Agricultural Lending. The purpose of the meetings was to understand how the higher performance technologies offered by the Compacts were going to reduce risks and increase the profitability of the farm from the point of view of finance and insurance providers to smallholder farmers. NIRSAL's procedures for providing loan guarantees to cereal farmers was presented and discussed in detail and their expectation was that better technology would improve the profitability of smallholder operations thereby making them more creditworthy.

In addition, the Clearinghouse identified opportunities to better respond to the needs of smallholder farmers who always plant multiple crops in mixed cropping systems and integrate them with livestock enterprises. Agrodealers serving these farming communities are critical as "last mile" retailers of products that embody Technology Toolkits. As stated previously (Section 3.0), TAAT operates around Compacts focusing on single value chains. In response, the Clearinghouse encourages Compacts to combine their technology toolkits and seek opportunities for distributing multiple products targeting the full range of needs of the smallholder farmer. Negotiations led to a network of agrodealers serving over 2,000 farmers in Western Kenya to package mixed technologies recommended by Compacts and have them deployed to their farmer clients including, for example, a combined maize-bean-FAW technology toolkit containing 12 products from seven input suppliers with these products placed on the shelves of an agrodealer network for test marketing. Another quick win consisted of designing a new fertilizer blend (RFC-ROOT, 5-13-21+) that MEA Fertilizers Ltd (Kenya) agreed to mass produce and bag into different quantities for test marketing. This new blend is intended for top-dressing cassava, sweet potato and other root (and even) fruit crops. Yet another timely quick win involved the development of a FAW Rapid Response that established youth as first responders to FAW invasion, a curative strategy that is now being expanded to four more countries and by other projects. This response offers farmers an immediate control option while IPM-based approaches are being developed against this new pest to African agriculture. In all, nine TAAT

Compacts were involved in these Kenya Quick Wins. These interactions between Compacts to deliver technologies are being analyzed by the Clearinghouse to understand how in-country activities can be better managed between TAAT Compacts and with various categories of national partners, including the private sector.

Intermediate Investment Outcome 3.3: *Develop a mid-term strategy to support the Clearinghouse during Years 2 to 5 of the TAAT Program lifetime.*

Investment Output 3.3.1: Publish a mid-term strategy and disseminate it to all TAAT stakeholders and include this strategy within Year 1 report.

The Clearinghouse has not yet completed and published its mid-term strategy as described in the project document but rather developed and pursues a solid process to do so. It conducted a detailed Proof of Concept exercise that in turn establishes the elements for its future operations. One factor in this delay is that demands placed upon the Clearinghouse by TAAT's many partners continued to unfold, extending well beyond its initial purpose of technology vetting and brokerage. This strategy will be completed and published by June 2019. This evolving Clearinghouse strategy builds upon the following nine understandings.

1. **A functional and responsive governance structure.** The Clearinghouse exists to service the TAAT Compacts in a direct and responsive manner. These services include technical interpretation, partnership management, value chain analysis, business development services, monitoring and evaluation and gender equity. Moreover, the Clearinghouse identifies where different Compacts should work toward common purpose and develops strategies around these opportunities.
2. **Independence of the Clearinghouse.** The Clearinghouse must remain an independent unit only answerable to the Project Steering Committee. Clearinghouse staff are appointed through IITA contracts but have no overriding institutional allegiance to it. While IITA provides facilities and some administrative services, the Clearinghouse was deliberately located away from IITA Headquarters. The decision by AfDB to disburse funds directly to each Implementing Agency rather than through IITA has strengthened the perception of the Clearinghouse as an independent entity.
3. **Maintaining a robust and transparent Compact development and review process.** The Clearinghouse is responsible for conducting a comprehensive review process to ensure that the technologies advanced through TAAT are potent and sufficiently promoted to achieve widespread impacts. It recognizes that TAAT operates downstream along the Research and Development continuum. It conducts honest and timely appraisal of Compact applications, and forwards its findings as recommendations for decision by the PSC.
4. **Selection of intervention countries and sites.** An important part of Compact review addresses where interventions occur and through which combination of partners and stakeholders. It recognizes that many effective agricultural networks exist and seeks to partner with them, but not to have TAAT operations to become subsumed within them. It also recognizes that different African countries are at different stages of agricultural development and that opportunities must be shared among, and adjusted to them rather than only working in countries with strongest infrastructures.
5. **Private sector participation.** Agricultural transformation is in large part built upon the commercialization and marketing of yield- and value-enhancing input and processing technologies. Furthermore, many potent technologies are needed that have not yet been fully commercialized and this requires a full partnership with the private sector to make them more widely available. The Clearinghouse also recognizes that its private sector partners seek to maintain a competitive advantage and that collaboration through TAAT must not be seen as compromising their larger business interests.
6. **Last mile implementation.** Agricultural transformation requires management innovation among farmers that is led by agents of change. Government agricultural extension programs are a preferred extension mechanism, but not the only one. TAAT Compacts must have a strong element of agricultural extension but must be prepared to explore all opportunities of delivering extension, including by electronic means; and they must assess impacts derived from these popularizing efforts and adopt the most effective means which may vary from country to country. It should be recognized that extension efforts must be concerned with reaching farmers and their associations first, and then bringing them a stream of technologies, input products and know-how.

7. **Emphasis on gender equity and youth empowerment.** Agricultural technologies and the benefits they offer are intended for all members of the rural community. Often this requires that special consideration be paid to stakeholders that are too frequently marginalized and bypassed. Technologies that improve nutrition and health, as well as those that reduce drudgery are particularly important. The Clearinghouse exists in part to ensure that Compact targets related to women, youth and the vulnerable are upheld.
8. **Linkage to country programs.** TAAT exists to link productivity-enhancing and farm-modernizing technologies to the agricultural development programs and agendas of African countries. This linkage can be measured in terms of Technology Toolkit adoption and use, documented production increase and numbers of beneficiaries reached. An expedient mechanism toward this end is the inclusion of TAAT technologies and Compact services into agricultural development projects financed by the AfDB and other development agencies in order to expand the reach of the technologies being disseminated through the Compacts.
9. **Continuous innovation.** The Clearinghouse offers a wide range of on-demand services, and continuously innovates around those demands. It tackles difficult issues such as how best to scale proven technologies to the benefit of an increasing number of stakeholders, how to document these gains and bring them to other regions with similar potential, how to partner around these gains, and what corrections are needed to better achieve greater and more meaningful impact from such gains. It is tackling the challenge of monitoring the implementation of a very complex program implemented by dozens of institutions in over 28 countries and addressing an increasing amount of key agricultural value chains. A Monitoring, Evaluation and Learning framework has been developed and involves the M&E infrastructure of participating institutions and regional economic communities to enable comparisons between Compacts and countries, and a sharing of experiences across Africa.

Investment Output 3.3.2: Prepare and submit a proposal to extend the operations of the Clearinghouse.

The Clearinghouse has submitted a proposal to the Bill and Melinda Gates Foundation to continue its operations. A summary of that proposal follows.

This grant proposal seeks further support for the TAAT Clearinghouse and continuation and expansion of its technical advisory services to the Technologies for African Agricultural Transformation Program (TAAT). TAAT is a broad-based, collaborative flagship program led by the International Institute of Tropical Agriculture (IITA) aimed at modernizing African agriculture through the advancement of agricultural and agro-industrial technologies. It improves the business of agriculture across Africa, thus raising crop and livestock productivity, mitigating risks and promoting sustainable enterprise diversification. To achieve these goals, TAAT focuses upon the identification, promotion and dissemination of proven technologies and management innovations. The TAAT Clearinghouse was initiated in October 2017 through a one-year "Proof of Concept" grant from BMGF titled "Support to TAAT Clearing House Governance (OPP 1179223)". This project supported three Primary Investment Outcomes as described in this report. The need for the Clearinghouse and its brokerage functions is widely acknowledged, and now IITA seeks to extend and expand its services through a three-year Phase 2 grant.

This Phase 2 Investment is built around four Primary Investment Outcomes, eight Intermediate Outcomes and their 24 associated Output tasks. The essential advisory services to TAAT in terms of technology vetting and partnership management must continue. These Primary Investment Outcomes may be briefly described as: 1) Strengthen in-country coordination of TAAT activities and their linkages to on-going and future agricultural transformation projects; 2) Conduct technology advisory services to the Technologies for African Agricultural Transformation Project and other agricultural development initiatives in Africa; 3) Open a TAAT Information Portal, operate it to obtain maximum benefit from TAAT's Regional Technology Delivery Infrastructure and Technology Deployment efforts, and transfer such capability to other organizations; and 4) Advance technology outreach and pathways to scaling up agricultural technologies for agricultural transformation based on the identification of technology packages (toolkits) and associated partnerships for delivery. These services shall continue to identify and deploy proven technologies to large numbers of beneficiaries and provide specialized backstopping at regional, agro-ecological and country levels. During its next Phase, the Clearinghouse intends to strengthen linkages between TAAT Compact activities and initiatives supported by other investors in African agricultural

transformation in a manner that builds synergies and expands the reach of proven technologies to smallholder farmers. These potential partners include the World Bank, IFAD, USAID, the European Union, and more direct involvement with AGRA.

The TAAT Clearinghouse will continue to operate along the guidelines established at its inception. It will mobilize only proven agricultural technologies relating to the nine agricultural commodity value chains initiated by AfDB in Tier 1 and the four additional ones planned for Tier 2. TAAT remains an open membership platform, especially with regard to independent technology providers and those seeking to commercialize proven technologies and innovations. The Clearinghouse shall assist TAAT's nine current priority value chains in 28 (and more) countries through the promotion of 86 technology toolkits (= country x value chain interactions). The Clearinghouse recognizes seven main risks to its operations and offers mitigations to each. It will rely heavily upon guidance from BMGF Officers and lessons learned from its past and ongoing projects. It complies fully with the BMGF Open Access Policy. It recognizes the critical relationships for project success and appreciates the external factors likely to condition its sustainable impacts. Through this proposal, the Clearinghouse seeks investment support for three years (2019 through 2021) and requires about $6.07 million.

7.0 Conclusions and next steps. TAAT is an incredibly complex project, potentially covering 18 agricultural value chains operating in over 28 participating countries. In its first year of implementation, 12 commodity value chains grouped into nine Commodity Technology Delivery Compacts were included, while 6 Enabler Compacts were also added to the program to address cross-cutting issues of importance to enhancing agricultural productivity, promoting inclusivity or responding to an invading pest. In 2019, the number of Compacts will increase from 15 to 19, and at least five more commodities (banana and plantains, soybean and cowpea, and horticultural crops with focus on tomato) will be added. The program's objective remains the same: scaling up the adoption of productivity enhancing technologies to reach millions of farmers. Should this objective be reached, it will usher in an unprecedented change on the African continent, with millions of people escaping poverty and many others joining the middle class. Triggering this change needs to be well planned but at the same time must include a strong component of iterative problem solving. As the Clearinghouse comes to grip with the challenges to TAAT implementation, the expectation from the AfDB that is investing in TAAT, the aspirations of the African people and the philanthropic objective of the Bill and Melinda Gates Foundation, it is imperative that a Theory of Change be formulated to take into consideration not only the factors under TAAT Program control but also other influences beyond program control that have a strong bearing its success. This effort has begun in the context of the formulation of a partnership engagement strategy and in the discussion surrounding the framework for Monitoring and Evaluation and a link to TAAT impact assessment. It will also link with the recently revised Communication Strategy. It will require extensive consultation with and investment by the AfDB and other development agencies such as AGRA, the World Bank, IFAD, USAID, AUC-NEPAD, EUC, and others; but the continued strategic support to the Clearinghouse as an independent and honest broker of modernizing agricultural technologies across Africa remains critical.

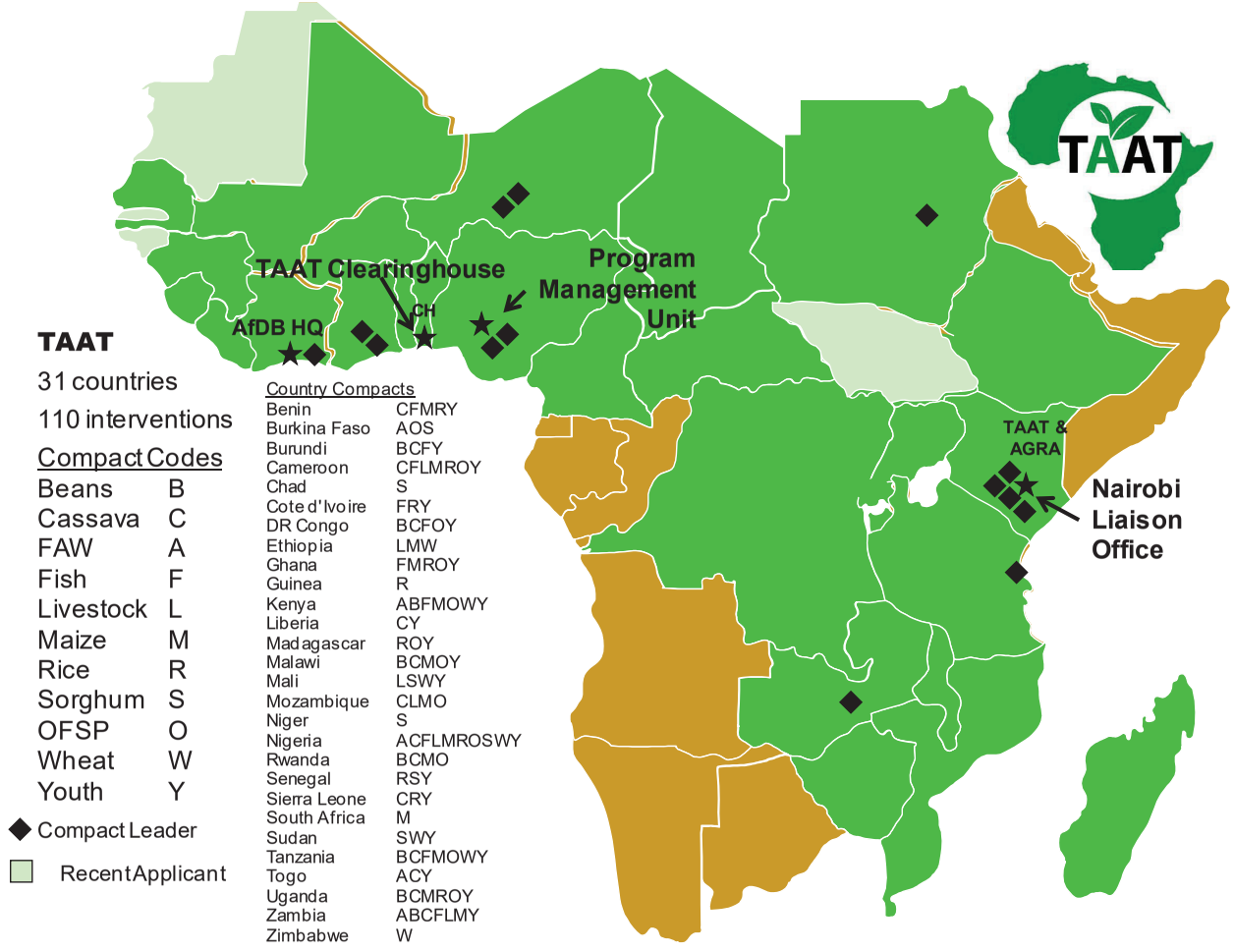
Appendix 1. TAAT Clearinghouse Project Investment Results Framework and Investment Output Status.

Investment Primary Outcomes	Investment Intermediate Outcome	Investment Outputs (Task validated through reports)	Status
1. During 2018 a Clearinghouse office will be established in Cotonou, Benin for the purpose of providing technology advisory services to the Technologies for African Agricultural Transforming Project and the AfDB Feed Africa Program	1.1. By March 2018 the Clearinghouse office in Cotonou is equipped, staffed and begins operations, and Liaison Office in Nairobi established	1.1.1. Clearinghouse Manager appointed, two professional staff (Technology and Partnership Officers) recruited and three national staff selected (Executive Assistant, Administrative Assistant and Driver)	Complete
		1.1.2. Capital equipment purchased (vehicle, computer work stations and office furniture) and full telecommunication facilities installed	Complete
	1.2. Establish collaborative structures that guide and inform the Clearinghouse	1.2.1. Clearinghouse Steering Committee (SC) selected and SC Chair develops first agenda for committee consideration. Clearinghouse Manager serves as Secretary to the SC	Complete
		1.2.2. Organize and conduct a Clearinghouse Inception Workshop to formalize working relations with TAAT, its technology providers (nine), its four (now six) enablers and AfDB Officers	Complete
2. By June 2018 the Clearinghouse issues its first round of technology advisory reviews for TAAT Tier 1 commodities	2.1. By June 2018 a first round assessment and mapping exercise of TAAT Tier 1 commodities is concluded	2.1.1. A compilation of candidate technologies is assembled for review by the Clearinghouse Technology and Partnership Officers and criteria for further action established	Complete
		2.1.2. At least 45 specific proven technologies are assembled into portfolios and recommended for promotion through TAAT campaigns in at least 10 Transformation Areas (or countries)	In progress
3. By December 2018 the Clearinghouse develops and validates a plan for stakeholder buy-in and commitment sharing over the larger TAAT Project lifetime	3.1. Communicate Clearinghouse rational and outputs to TAAT stakeholders	3.1.1. Design and execute a comprehensive communication strategy to effectively disseminate the goals, activities, and benefits of the TAAT Clearinghouse	In progress
		3.1.2. Establish Clearinghouse website with linkages to all TAAT partners and other social media	In progress
	3.2. Provide rationale for commercial and business benefits through agricultural technology support and demonstrate the positive socio-economic and macro-economic outcomes	3.2.1. Identify conducive policies for governments and regional agencies to act upon and establish and monitor Key Performance Indicators of agricultural transformation	Complete
		3.2.2. Contribute to at least 10 AfDP Missions that advance loan agreements within the Feed Africa Program in a manner that mobilizes TAAT's proven technologies, and results in more cost- and time-effective agricultural transformation	Complete
	3.3. Develop a mid-term strategy to support the Clearinghouse during Years 2 to 5 of the TAAT Program lifetime.	3.3.1. Publish mid-term strategy and disseminate it to all TAAT stakeholders; include the strategy in Year 1 report	In progress
		3.3.2. Prepare and submit proposal to extend the operations of the Clearinghouse	Complete

Appendix 2. A matrix of participating countries and value chain Compact membership.

Country	region	Cassava	OFSP	Maize	Rice	Fish	Beans	Sorghum	Wheat	Animals	Total
Nigeria	West	1	1	1	1	1	0	1	1	1	8
Cameroon	Central	1	1	1	1	1	0	0	0	1	6
Ghana	West	1	1	1	1	1	0	0	0	0	5
Uganda	East	1	1	1	1	0	1	0	0	0	5
Tanzania	East	1	1	0	0	1	1	0	1	0	5
DR Congo	East	1	1	0	0	1	1	0	0	0	4
Malawi	Southern	1	1	1	0	0	1	0	0	0	4
Mozambique	Southern	1	1	1	0	0	0	0	0	1	4
Rwanda	Central	1	1	1	0	0	1	0	0	0	4
Benin	West	1	0	1	1	1	0	0	0	0	4
Kenya	East	0	1	1	0	0	1	0	1	0	4
Burkina Faso	Sahel	0	1	0	1	0	0	1	0	0	3
Mali	Sahel	0	0	0	1	0	0	1	1	1	4
Burundi	Central	1	0	0	0	1	1	0	0	0	3
Ethiopia	East	0	0	1	0	0	0	0	1	1	3
Zambia	Southern	1	0	0	0	1	0	0	0	1	3
Cote d' ivoire	West	0	0	0	1	1	0	0	0	0	2
Madagascar	Southern	0	1	0	1	0	0	0	0	0	2
Senegal	Sahel	0	0	0	1	0	0	1	0	0	2
Sierra Leone	West	1	0	0	1	0	0	0	0	0	2
Sudan	Sahel	0	0	0	0	0	0	1	1	0	2
Zimbabwe	Southern	0	0	0	0	0	1	0	1	0	2
Chad	Sahel	0	0	0	0	0	0	1	0	0	1
Niger	Sahel	0	0	0	0	0	0	1	0	0	1
Liberia	West	1	0	0	0	0	0	0	0	0	1
Togo	West	1	0	0	0	0	0	0	0	0	1
GuineaCk	West	0	0	1	0	0	0	0	0	0	1
Total		15	12	11	11	9	8	7	7	6	86

Appendix 3. A map of TAAT participating countries showing Compact membership and Program leaders.



Technologies for African Agricultural Transformation (TAAT) and its Clearinghouse Office

The developmental objective of TAAT is to rapidly expand access of smallholder farmers to high yielding agricultural technologies that improve their food production, assure food security and raise rural incomes. This goal is achieved by delivering regional public goods for rapidly scaling up agricultural technologies across similar agro-ecological zones. This result is achieved through three principal mechanisms; 1) creating an enabling environment for technology adoption by farmers, 2) facilitating effective delivery of these technologies to farmers through a structured Regional Technology Delivery Infrastructure and 3) raising agricultural production and productivity through strategic interventions that include improved crop varieties and animal breeds, accompanying good management practices and vigorous farmer outreach campaigns at the Regional Member Country (RMC) level. The important roles of sound policies, empowering women and youth, strengthening extension systems and engaging with the private sector is implicit within this strategy. The Clearinghouse is the body within TAAT that decides which technologies should be disseminated. Moreover, it is tasked with the responsibility to guide the deployment of proven agricultural technologies to scale in a commercially sustainable fashion through the establishment of partnerships that provide access to expertise required to design, implement, and monitor the progress of technology dissemination campaigns. In this way, the Clearinghouse is essentially an agricultural transformation incubation platform, aimed at facilitating partnerships and strengthening national agricultural development programs to reach millions of farmers with appropriate agricultural technologies.

Dr. Mpoko Bokanga, Head of the TAAT Clearinghouse

Back cover photographic credit: TAAT's maize toolkit includes an array of new maize varieties (upper left) including those mobilized through the TEGO mechanism (top center); greater access to mechanization services (upper right); and technologies that counter threats from parasitic striga (lower left), health-threatening aflatoxins (bottom center) and the recent invasion by Fall Army Worm (lower right).

TAAT Clearinghouse Establishment and First Year Operations

In collaboration with

IITA Transforming African Agriculture
AATF
AfricaRice Rice science at the service of Africa
CIAT
CIMMYT International Maize and Wheat Improvement Center
CIP International Potato Center A CGIAR RESEARCH CENTER
FARA Forum for Agricultural Research in Africa
ICARDA
ICRISAT International Crops Research Institute for the Semi-Arid Tropics
IFDC Developing Agriculture from the Ground Up
ILRI International Livestock Research Institute
IWMI International Water Management Institute
WorldFish