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Technologies for African
Agricultural Transformation

AGRICULTURAL TRANSFORMATION THROUGH WHEAT:
***An Outcome Evaluation of TAAT Wheat Compact's
Interventions in Ethiopia***

TECHNOLOGIES FOR AFRICAN AGRICULTURAL TRANSFORMATION (TAAT)



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TAAT MEL Working Document No. 006

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This working paper has been prepared as a deliverable for the Monitoring and Evaluation Unit of the TAAT program and has not been peer-reviewed. Any opinions stated herein are those of the author (s) and do not necessarily reflect the points of view of the TAAT programme.

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Background

1. Overview of the Technologies for African Agricultural Transformation (TAAT)

The Technologies for African Agricultural Transformation (TAAT), launched in 2018, is an initiative under the “Feed Africa’s Strategy, 2016-2025” of the African Development Bank. It is structured around nine commodities of importance to the African region. This includes maize, rice, wheat, high-iron beans, cassava, orange-fleshed sweet potato, sorghum/millet, small livestock, and aquaculture. The production-induced technologies included soil fertility management, water management, training/capacity development, policy support, youth in agribusiness and response to the armyworm.

The intervention of TAAT was in conjunction with National and International Research networks to deploy proven agricultural technologies and train value chain actors

in Good Agricultural Practices. Enhanced diversification and commercialisation through access to the market was also made possible by collaborations between government, private sector players, Non-Governmental Organizations, Community Based Associations (CBA), and individual actors (farmers, input suppliers, processors, fabricators, financial service providers etc.). The broad scope of stakeholder involvement is expected to provide an avenue for the sustainability of TAAT interventions after completion. The interventions also included a series of enabler systems to provide a conducive environment for adopting and scaling introduced technologies.

The implementation of TAAT was coordinated by the International Institute of Tropical Agriculture (IITA) in partnership with other research institutions at regional and international levels. They include The African Agricultural Technology Foundation (AATF), AfricaRice Centre, the Alliance of Bioversity International and CIAT, the Centro Internacional de la Papa (CIP), the Forum for Agricultural Research in Africa (FARA), the International Centre for Agricultural Research in the Dry Areas (ICARDA), the

International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), the International Fertiliser Development Corporation (IFDC), the International Institute of Tropical Agriculture (IITA), the International Livestock Research Institute (ILRI), the International Water Management Institute (IWMI), and the WorldFish Centre.

The programme works through an integrated intervention of 15 Compacts, comprising nine “Commodity Compacts” and “Enabler Compacts”. There are six (6) enabler compacts within TAAT to support the Commodity Compacts. These provide a conducive environment and specialist services for the sustainable attainment of programme objectives. The “enabler compacts” are soil fertility management, water management, capacity development, policy support, attracting African youth in agribusiness and fall armyworm response.

2. TAAT Wheat Compact: The Ethiopia Context

Through the activities of TAAT Wheat Compact, thousands of smallholder farmers in Ethiopia now have access to quality seed of climate-

smart and heat-tolerant varieties for wheat production. About 10 heat-tolerant, rust-resistant and high-yielding wheat varieties with grain quality were deployed. Farmers were able to access 62,303 tons through the deployment model of the TAAT Wheat Compact led by the International Center for Agriculture Research in the Dry Areas (ICARDA) in collaboration with the Ethiopian National and Regional Agricultural Research Institute (ENARI), public and private seed companies, seed producer cooperatives and farmer seed producer groups at IP sites. The African Development Bank’s involvement in the improvement of Ethiopia’s wheat sector began in the 2012 season with the Support to Agricultural Research for Development of Strategic Crops (SARD-SC) Wheat project. This was followed in 2018 by the TAAT programme, which built on the legacy of the SARD-SC upon its completion. This has changed the wheat production landscape significantly through the irrigated wheat production scheme in the country.

3. The TAAT Wheat Compact’s deployment approach

Wheat production in Ethiopia is primarily rainfed. The TAAT Wheat Compact used the Innovation Platform (IP) approach to create awareness and facilitate the adoption of improved high-yield wheat varieties and accompanying technologies. The IP model was introduced to bring all the stakeholders together for operational implementation. The TAAT Wheat Compact adopted the IP approach as an effective tool for scaling up proven wheat technologies to achieve a transformative impact at scale, for bringing together and forging a strong and sustainable partnership among key stakeholders (including farmers, input providers, seed producers, extension agents, financial institutions, service providers, processors/millers) along the wheat value chain, and for linking farmers to input and out markets. Considering lessons learned, establishing a national alliance, platform, or forum of stakeholders or a wheat board or council helps to maintain the momentum and move forward the wheat agenda at the national level for sustainability.

A total of 9 IPs were established in Ethiopia which were organized in three major wheat growing regions of which Oromia,

[1 https://www.afdb.org/en/dakar-2-summit-feed-africa-food-sovereignty-and-resi-](https://www.afdb.org/en/dakar-2-summit-feed-africa-food-sovereignty-and-resi-)



(Fentale, Jeju, Sire, Beji, Bosset), Afar (Amibera, Asayita, Afambo), and Benshangul Gumuz (Mao Komo). The TAAT Wheat Compact set up IPs at strategic and operational intervention sites as an effective tool for multi-stakeholder involvement. Membership ranges from farmer representatives, researchers, civil society organisations, local organisations including women and youth groups, extension system agents, production input suppliers, processors, seed producers, financial institutions, NGOs, state agricultural officers and local policy makers), etc.

The participation of members facilitates interaction for joint actions and diagnosis of challenges that may hinder progress, explore opportunities and devise sustainable solutions for scaling up proven technologies and promoting wheat production, processing and marketing along the value chain.

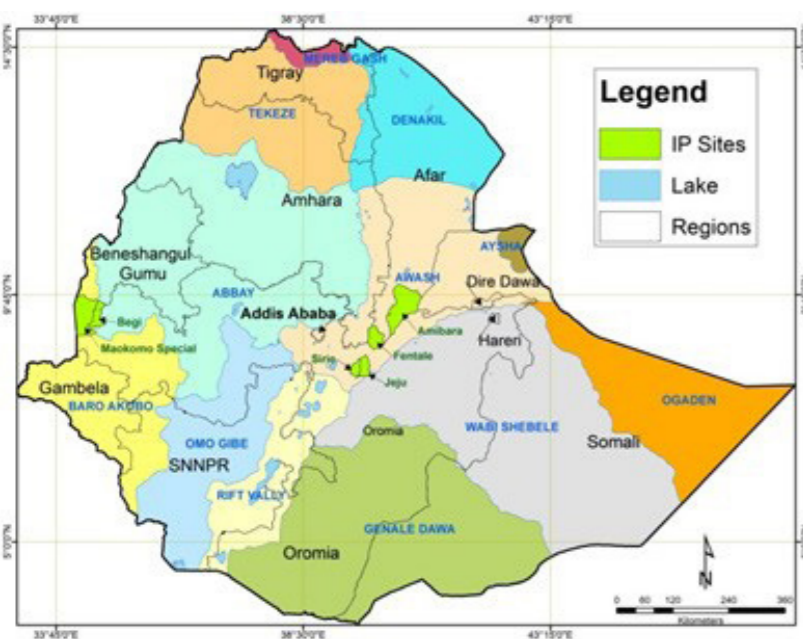


Figure 1. Location of Innovation Platforms for Wheat Compact in Ethiopia.

Members of IPs were trained in various activities in the wheat value chain to empower them with the right knowledge and skills to support the development of the value chain from production to processing such as training on Good Agricultural practices (GAPs) including land preparation, planting, fertilizer application, amount and frequency of irrigation application,

[lience/about-dakar-2-summit/scaling-heat-tolerant-wheat-ethiopia.2 https://propas.iita.org/en/solutions/furrow-irrigated-raised-bed-wheat-production/86/details/#:~:text=In%20mid-altitude%20highland](https://www.iaiafrica.org/en/solutions/furrow-irrigated-raised-bed-wheat-production/86/details/#:~:text=In%20mid-altitude%20highland)

weed control, disease and pest control, harvesting and post-harvest management.

Additionally, technical support was provided to various farmer groups to boost production through the supply of certified seed and quality declared seeds of heat-tolerant and high-yielding varieties, such as Fentale 1, Fentale 2, Amibera 1, Amibra 2, and Lucy for irrigated areas and many more like Obora, Sanate, etc. for rain fed areas.

Furthermore, the TAAT Wheat Compact helped to establish linkage of farmers to agro-processors and markets to sell their produce at better prices. Using IP as the model for technology demonstration, popularization and delivery and reaching farmers was proved to be effective for technology transfer, capacity building and linking farmers to input and output markets. Promote entrepreneurship and product value addition within the IP framework by organizing youth and women groups and engage them in various businesses through the provision of focused hands-on training and entrepreneurship skill in areas of wheat grain and seed production, agricultural service provisions, value addition, processing and marketing along the wheat value chain.

The TAAT Wheat Compact also trained farmers on low-cost irrigation techniques such as the furrow irrigated raised bed which is highly efficient technique involving engineered soil surfaces and controlled dispensation, which ensures that farmers do not use more water than what is needed. In mid-altitude highland wheat farming systems of Ethiopia, it has been found that raised bed furrow irrigation consumes 28% less water and yields 27% more grains compared to traditional flatbed planting and blanket flooding methods.² In Ethiopia, irrigated-wheat area quickly increased from less than 5,000 hectares in 2017-18 to 187,240 ha in 2020-21, and to 650,000 ha in 2021/22 season (ICARDA, 2020). The use of on-site demonstrations, workshops, and ICT were all employed to train farmers in Good Agricultural Practices (GAP) and advance the reach of more beneficiaries. By the end of TAAT-I, the TAAT Wheat Compact reached 671,223 beneficiaries.

The TAAT Wheat Compact also put effort into

developing youth and gender-focused group entrepreneurship and innovative agribusinesses at various segments of the wheat value chain (production, processing and marketing) for the creation of job opportunities and income to youth and women groups in rural and urban areas and the linkages created among value chain actors notably inputs and outputs markets has shown clear opportunities. If such approaches are supported and sustained with access to financial services and technical support, they could be building pillars of the sustainability of the programme.

To ensure sustainable seed system development, a seed roadmap was developed in collaboration with different actors involved in the wheat sector. Wheat seed production is a 3-4-year plan where different seed classes must be produced, from breeder seed to certified seed. The roadmap development, commensurate with area expansion against production targets of different seed classes, will provide an overview of seed requirements and opportunities for proper production planning by seed value chain actors.

However, without adequate government commitment and private sector participation, all efforts will be in vain. The efforts of wheat seed sector development should take into account to i) Promote the technology and policy best practices consistent with the global seed industry; ii) Support fast-track variety development, registration, release and their accelerated seed multiplication; iii) Re-orient the operations of public sector agencies along commercial lines; iv) Encourage private sector in wheat seed through appropriate policies and incentives; and v) Improve the quality of seed sold to farmers for higher yield and better income.

4. Operationalisation of the TAAT Wheat Compact in Ethiopia using Monitoring and Evaluation lens

The TAAT Wheat Compact operationalised the deployment of wheat technologies through signing partnership agreements with several partners with clear roles and responsibilities (annex 1). As a pre-requisite for the deployment of TAT technologies continent-wide, a partnership agreement

was first signed with the Ethiopian Institute of Agricultural Research (EIAR), whose role is to guide the deployment of new technologies for safety and control purposes. Thereafter, a jointly prepared and approved Plan of Work and Budget (POWB) between ICARDA and EIAR was developed for a smooth implementation and operationalisation of the activities on the ground.

Recognising that wheat is one of the strategic crops for the Feed Africa Strategy and a political crop for the benefit of the people of the planet, Ethiopia prioritises the development of the wheat sector to be self-sufficient by 2025. It was critical to delineate the roles and responsibilities of each partner to deliver on their obligations and commitment to the national wheat agenda and assess their contribution to the expected outputs and outcome results of the TAAT Wheat Compact interventions.

Therefore, the Compact devised a performance monitoring plan where a detailed set of activities, outputs and outcomes, with corresponding indicators and targets, data source, data collection methods, and roles and responsibilities were clearly defined. A High-level inter-ministerial committee consisting of the Ministries of Agriculture, Water, Irrigation & Energy and Finance and other partners such as the Ethiopian Institute of Agricultural Research was established with a target to achieve wheat self-sufficiency by 2025 in Ethiopia. The Government of Ethiopia has been spearheading irrigated wheat area expansion in the lowland and traditionally rainfed highland agro-ecologies, where the area reached 1.3 million hectares in the 2022/23 crop season.

Through experiential learning and sharing of best institutional practices with the active involvement of the NARES partners and IP actors, the data and information generated and data quality were assessed by the Compact Coordination Unit for validation. This plan served as the overarching framework to generate and analyse data and process information, to identify key strengths and weaknesses in technical and administrative activities and to develop measures to increase the efficiency and effectiveness of the project. The programme had a clear focus on scaling out proven improved wheat varieties and associated integrated crop management practices, which resulted in increased production

and productivity (in both rainfed and irrigated production systems), ensured food and nutritional security and increased market opportunities for producers, job opportunities and employment for the youth and women and ultimately achieve wheat self-sufficiency.

Through literature review, the Theory of Change of the TAAT Wheat Compact in Ethiopia was reconstructed to understand how the claimed outcomes happened, who supported this effort, what contributed to the change(s) observed, and to understand what lessons were learnt and take corrective measures (Stein and Valters, 2012).

awareness-raising campaigns, facilitating and supporting scaling up and training activities at the project IP sites, and promoting wheat technology toolkits to draw in private sector investment in wheat production, processing, and marketing. Among them is Ethiopia's NARS (EIAR).

When implementing various activities with farmers, NARS leads the demonstration and offers technical assistance and support to farmers and local agricultural or extension offices. Early generation seed (EGS) produced by NARS will be available to cooperatives, private or public seed companies, and farmer seed

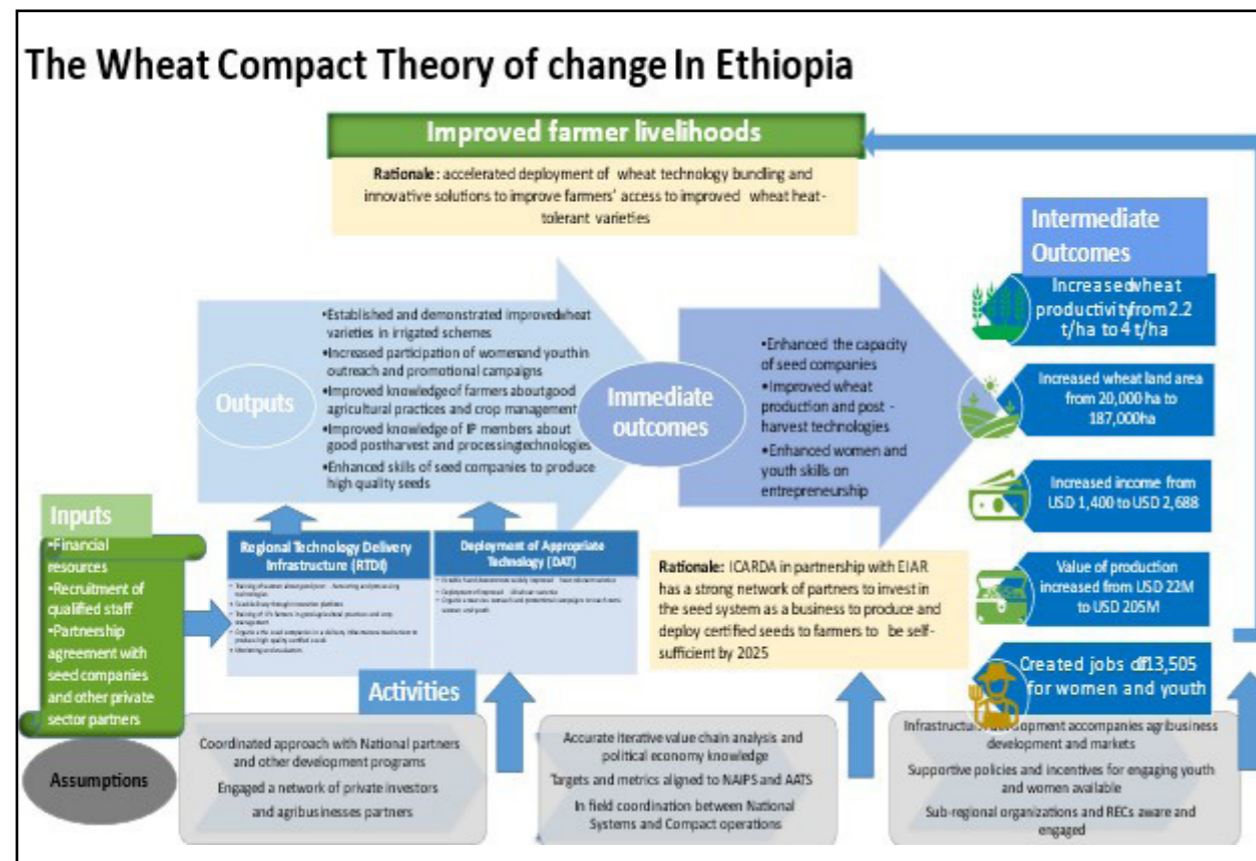


Figure 2. The TAAT Wheat Compact's Theory of Change in Ethiopia

5. Partnership arrangement

One of NARS's responsibilities is activating and coordinating all stakeholders and value chain actors involved in scaling up activities. Other tasks include outreach, advocacy, and

producers at IP sites. These entities will then produce and market the seed in response to farmer demand. In an effort to create employment opportunities locally, efforts are made to connect farmers with markets through partnerships with agro-processors in the area or to involve women and youth in the value addition of wheat.

In the wheat value chain, development partners like public or private seed companies, seed

producer cooperatives or associations, agro-processors, sector associations (farmer associations, millers associations), and policymakers were actively engaged by NARS partners at a strategic level. At the national level, they acted as information brokers and advocates for the wheat sector's transformation by utilising public and private funding. The NARS partners participated in steering and technical committees that developed and implemented plans for target nations to be self-sufficient in wheat. Specific partners list includes the following:

- **Basic (Foundation) and Certified Seed:** Ethiopian Seed Enterprise, Oromia Seed Enterprise, Amhara Seed Enterprise, South Seed Enterprise, Tigray Seed Producer's Cooperative, Gadissa Gobana Farm PLC, Makiya Seed PLC, Haji Abdela Seed PLC, Haji Abdela Seed PLC, Tensa'e Seed PLC produce foundation and certified seeds.
- **Breeder and pre-basic seeds:** EIAR, RARIS
- **Fertilizer and agrochemical providers:** AISCO, General Chemicals Trading, Chemtex, Syngenta
- **Extension services and awareness creation:** Ministry of Agriculture, Regional Bureau of Agriculture in regional states, policymakers
- **Processors and Millers:** Adama Food Processing, Albima Food Processing, Kaliti Food Processing, K.O.J.J, Yetebabarut Food Processing, Lemlem Food Processing, Wakene Food Processing; Ethiopian Millers Association.
- **Financial institutions:** Oromia Cooperative Bank, Oromia Credit and Saving Association, Dehub Cooperative Bank, SNNP Credit and Saving Association.

Technology Deployed	Location where the technology is deployed		Associated technologies	Partners involved in the deployment of the technology	
	Country	Deployment site		Partners	Role
Heat-tolerant and high-yielding wheat varieties, including Fentale 1, Fentale 2 Amibara 1, amibara 2 and, Lucy for irrigated areas; Obora, Sanate for rain fed areas	Ethiopia	Oromia, (Fentale, Jeju, Sire, Beji, Bosset), Afar (Amibera, Asayita, Afambo), and Benshangul Gumuz (Mao Komo).	Good Agricultural Practices (GAPs) including land preparation, planting, fertilizer application, amount and frequency of irrigation application, weed control, disease and pest control, harvesting and post-harvest management	Ethiopian Seed Enterprise, Oromia Seed Enterprise, Amhara Seed Enterprise, South Seed Enterprise, Tigray Seed Producer's Cooperative, Gadissa Gobana Farm PLC, Makiya Seed PLC, Haji Abdela Seed PLC, Tensa'e Seed PLC	Produce foundation and certified seeds
				EIAR, RARIS	Produce breeder and pre-basic seeds
				AISCO, General Chemicals Trading, Chemtex, Syngenta	Fertiliser and agro-chemical providers
				Federal Ministry of Agriculture, Bureau of Agriculture of Regional States, policy makers	Extension services and awareness creation
				Adama Food Processing, Albima Food Processing, Kaliti Food Processing, K.O.J.J, Yetebabarut Food Processing, Lemlem Food Processing, Wakene Food Processing	Processors/millers
				Oromia Cooperative Bank, Oromia Credit and Saving Association, Dehub Cooperative Bank, SNNP Credit and Saving Association	Financial institutions

Table 1. Stakeholders Mapping and Analysis

6. Findings of the review

This section presents the findings of the literature review on the operationalisation of the TAAT Wheat Compact in Ethiopia. It seeks to highlight the results reported as outputs and outcomes of the Wheat Compact activities. The findings intend to demonstrate the implementation processes used to deploy TAAT Wheat technologies and the partnerships and delivery infrastructure used to supply breeder and foundation seeds to infield partners who produce and deliver certified seeds to farmers for production. The findings intend to capture and understand the deployment of the TAAT Wheat Compact activities to achieve expected outputs and outcomes by documenting lessons learned intended to inform the Compact where corrective measures are needed.

6.1. Activities

The ICARDA-led the TAAT Wheat Compact in close collaboration with EIAR and other partners to release heat-tolerant and rust-resistant wheat varieties within the Ethiopian wheat production sector. The following toolkit was assembled by ICARDA and demonstrated to partners, Good Agricultural Practices (GAPs) including land preparation, planting, fertilizer application, amount, and frequency of irrigation application; weed control, disease, and pest control, harvesting and post-harvest management. The wheat technology toolkit was assembled with economic feasibility data and technology awareness was conducted to reach farmers and help the country improve wheat productivity and be self-sufficient by 2025. A team of experts was recruited by ICARDA to ensure that the project is fully rolled out, resources allocated to partners and a strategy devised to track progress. The following activities

were done to achieve the expected results:

- **Technology Validation and demonstration:** This is a precursor to introduction and scaling at the innovation platforms.
- **Training and Capacity Building:** The capacity of farmers, youth and women's groups and other stakeholders along the value chain were strengthened in wheat and seed production, entrepreneurship skills, product value addition and farm machinery maintenance services at all innovation platform (IP) sites.
- **Capacity building on Good Agricultural Practices (GAPs):** was also included in the training. The training module included land preparation, planting, fertiliser application, amount and frequency of irrigation application, weed control, disease and pest control, harvesting and post-harvest management.



- **Demonstration of technology:** hands-on training at IP sites and proper application of the recommended packages were the key to their success.
- **Seed Delivery:** producing and distributing certified seed through private and public seed companies and with farmer groups at IP sites.
- **Pilot of mechanised irrigation:** (Raised bed irrigation) for wheat based on local technology that could be scaled.
- **Value chain organisation:** To link farmers to input and output markets.
- **Community collaborations:** This is achieved through innovation platforms to ensure
- **Technology scaling up:** TAAT wheat scaling up and dissemination activities were implemented and promoted, including youth and women in leadership positions and as beneficiaries at the representative project-established IP sites. Raised-bed technology was popularised in selected IP sites and promoted to farmers and stakeholders. Collaborative operations were maintained between TAAT Wheat Compact and various enablers for efficient common stakeholders' approach and combined technology toolkits.

6.2. Seed Production and Delivery

The deployment of heat-tolerant and rust-resistant wheat varieties through IPs in different locations was done in conjunction with several partners who signed sub-agreement contracts with the Compact to support implementing fieldwork activities. For partnerships outside the

Compact, agreements were signed with strategic value chain partners in Ethiopia to accelerate the production and distribution of quality heat and drought-tolerant improved varieties. Through these partnerships, approximately 597.5 MT of basic seed, 61,311.8 MT of certified seeds and 392.2 MT of QDS were deployed in the country to stimulate seed production and provide more farmers with quality seed for planting across the country across larger land areas. To support the TAAT Wheat Compact's effort at providing basic seeds at no cost, partners helped distribute the quality declared seeds. Over the years, 61,311.8 MT certified seed was produced and planted over 408,745 hectares. However, secondary farmer-to-farmer diffusion enabled the spread of technologies and innovations across a wider geographic area of wheat production.

The provision of seed through TAAT improves the seed system and delivery infrastructure by getting improved varieties out into the market at an accelerated pace. From there, it is expected that partners will continue to ensure productivity continues and that farmers are given access to adequate amounts of seed.

6.3 Desired Outcomes in TAAT Wheat Compact's interventions in Ethiopia

The desired outcomes of the TAAT Wheat Compact interventions hinged on enhancing productivity, farmers' income, job creation, and value addition, all leading towards attaining wheat self-sufficiency before or by 2025.

- **Increased annual income per capita for households:** Farmers per household income

from wheat production reached US\$ 2,688 compared to the baseline of US\$ 1,400. Based on the average increase in productivity, the participating farmers' income was estimated to be increased by about 92% per cent.

• **Productivity in intervention sites:** Through the TAAT-Wheat Compact intervention, the estimated average productivity of irrigated wheat is 4.4 tons per hectare.

• **Production in Ethiopia:** Thanks to the AfDB-funded TAAT initiative, the successful introduction and deployment of heat-tolerant wheat varieties with integrated packages in the non-traditional lowland hot agro-ecologies of Ethiopia has opened up a new opportunity to cultivate and expand irrigated wheat production more profitably and competitively. As a result, the cultivation of irrigated wheat areas has astronomically increased from less than 5,000 ha in 2018/19, 20,000 ha in 2019/20, 187,000 ha in 2020/21 to 400,000 ha in 2021/22 cropping season.

• **Value of production:** From irrigated wheat alone, with an area of 5,000 ha in 2018/19 to 20,000 hectares in 2018/19, 187,000 hectares in 2019/20 to 400,000 hectares in 2020/21, about 22,000, 88,000, 822,800 and 1.6 million metric tons, respectively of wheat grain produced. With conservative estimates of wheat grain price of US\$250 per ton, the production value can be estimated at US\$ 5.5 million in 2018/19, US\$ 22 million in 2019/20, \$205 million in 2020/21 and US\$ 400 million in 2021/22. The 2021/22 combined wheat production from irrigated (1.6 million) and rain-fed (5.4 million) systems reached 7.0 million metric tons, generating a revenue of about US\$ 1,750 million.

• **Employment created:** The wheat compact created additional job opportunities for farmers, youth and women in wheat grain production, seed production, value addition and allied services (machine rentals, services). About 113,505 additional jobs were created, of which 44% are youth and women, higher than the actual target of 45,000 jobs. This represents about a 252% increase. A total of 982 entrepreneurs were created, of which 28.5% were female.

6.4. Beneficiaries reached

Beneficiary farmers were reached using different avenues such as seed distribution, job creation, training, field days and entrepreneurial training. A total of 671,223 beneficiaries have been reached during project implementation. There were no specific targeted media campaigns, but news about irrigated wheat covered by mainstream media and popular media such as (i) Federal Ethiopian Broadcasting Corporation TV and Regional media networks like Oromia Broadcasting Network TV transmitted about high-level engagements and field days, (ii) Federal Ethiopian Radio and Regional media networks such as Oromia, and Afar Radio and FM Radios, and (iii) News media (Reporter, Addis Zemen)

• **Training of farmers:** In bundled Good Agricultural Practices (GAP including land preparation, planting, fertiliser application, amount and frequency of irrigation application, weed control, disease and pest control, harvesting and post-harvest management. Hence, 15,982 farmers trained in GAPs and 5,200 farmers through field days.

• **Women and youth engagement:** In Ethiopia, 49,1565 males, 170257 females and 9401 youth were reached under the wheat compact. In all, 39,858 were trained against the actual target of beneficiaries of 14,275, of which 34% are female. Hence, there was a 279% increase in trained beneficiaries under 14,090 field days. Through government funding, Ethiopia's irrigated wheat area increased from approximately 5,000 hectares in 2017/18 to 20,000 ha in 2018/19 to 187,000 in the 2020/21 cropping season, achieving an approximate average productivity of irrigated wheat of 4.4 tons ha⁻¹. This was due to the recent successful and widespread deployment of heat-tolerant wheat varieties.

7. Success stories from TAAT Wheat Interventions in Ethiopia

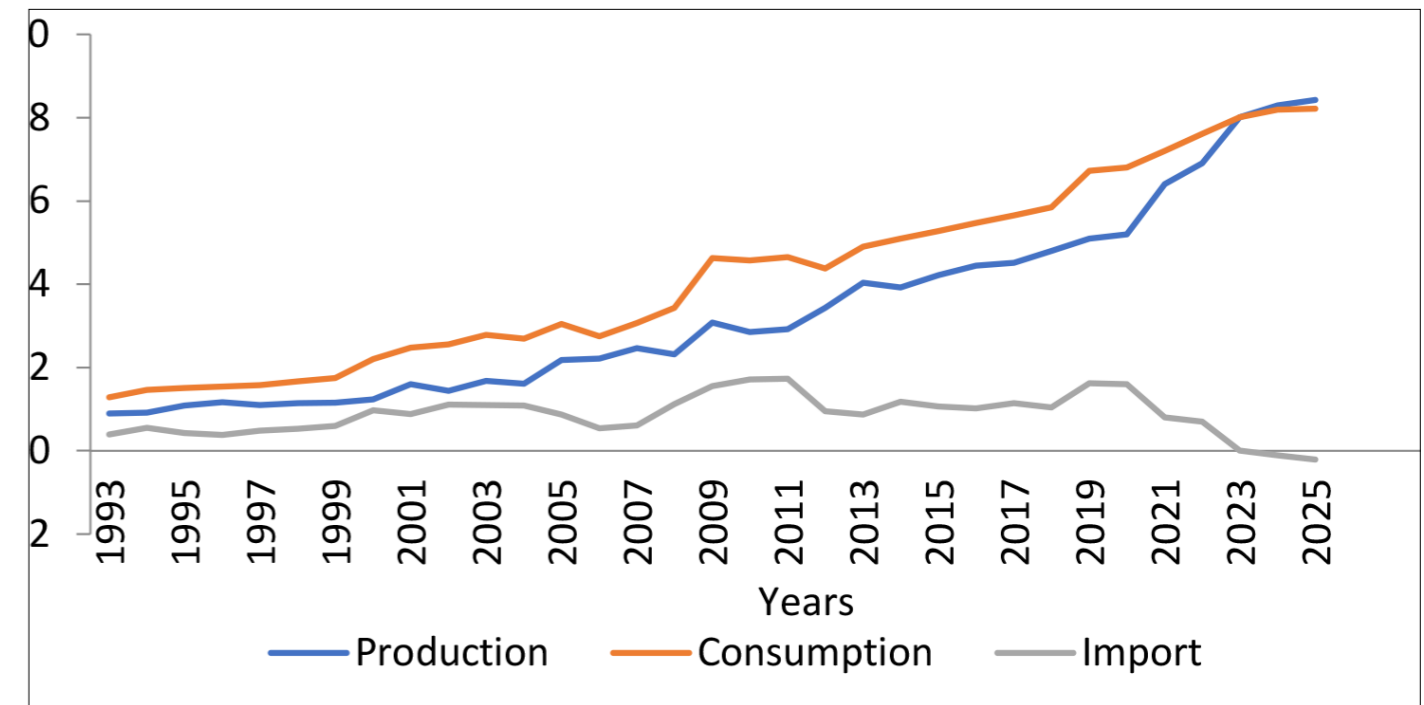


Figure 3. Trends of Wheat Production, imports, and consumption in Ethiopia (1993-2021) with projection for achieving self-sufficiency by 2025



How heat-tolerant variety increased productivity of a female wheat farmer in Ethiopia

Chaltu Kabele, an Ethiopian wheat farmer, recalls the difficulties she faced providing for her family of 10 with standard wheat seeds that produced very low yields in the hot, dry lowlands of the Awash community where she lives. Following the introduction of TAAT heat-tolerant wheat varieties, she now produces up to 5 tons of wheat per hectare. Kabele is one of 28,000 farmers tilling 20,000 hectares of farmland who have benefitted from the TAAT programme to date.

8. Wheat production trends

The production of wheat in Ethiopia has been increasing in recent years, aiming for self-sufficiency. The country has various wheat

production regions, with the major ones located in the highlands. Wheat is grown both by smallholder farmers and larger commercial agricultural enterprises. Yet, the country still faces challenges in achieving its desired level of production due to factors like weather conditions which have resulted in an increase in importation. Figure 3 shows the wide supply-demand gap in wheat production. The domestic production reached the highest peak in 2020 which might be attributed to the impact of TAAT intervention. A little decline was observed in importation of wheat from 2019. Increasing the productivity among local farmers will provide the opportunity for the commodity to serve as an import substitute if wheat production in Ethiopia is increased.

9. Lessons Learnt and Challenges

The TAAT wheat programme in Ethiopia has made remarkable progress in increasing the productivity of smallholder wheat farmers using proven and highly adaptable technologies. These technologies with agroecology context toolkits were able to deliver many of the expected results in the IPs. IPs and multi-stakeholder inclusion were exciting arrangements in agricultural interventions, as they allowed for integration and mutual accountability. Therefore, the development and supply of heat-tolerant varieties must continue to be the topmost priority of TAAT to ensure the continued success of this program, as we observed the heat and drought to be the main factors affecting wheat production.

In addition, the following lessons/takeaways contributed to the success.

1. Ensure area expansion for wheat with

adequate facilities for irrigation schemes (rehabilitation, cleaning, etc.) and improved irrigation management to reduce the amount of water used for wheat production.

2. Increase the volume of wheat seed delivery by incentivising private seed companies through assured markets and access to capital.
3. Ensure the production of better grain quality by introducing a grain grading system and premium pricing.
4. Improve logistics in aggregation, storage and transportation by cooperatives and producer associations.
5. Facilitate capital and credits for farmers and value chain actors financed by the agricultural, rural microfinance and commercial banks.
6. Creating forward and backward linkage in the wheat value chain, introducing contract farming involving farmers' cooperatives/associations, seed producers, and flour millers.
7. Ensure system sustainability by introducing legume crops in a wheat-based cropping system to avoid wheat monocropping.

10. Conclusion and Way forward

The TAAT Wheat Compact in Ethiopia successfully used the IP approach, which allowed technology to be context-built. The effects were seen in massive improvements in the production of wheat and the potential for self-sufficiency in production. Subsequent interventions, however, may need to consider the following:

•Technology and innovation deployment: Technologies or seeds alone will not lead to large-scale adoption and crop yield increases.

More focus should be placed on market access and access to finance. Without these, efforts to scale technologies will underperform or fail.

•Leveraging resources on country programmes: TAAT Clearinghouse's role in coordinating TAAT contribution to programme design and implementation was taken up in the second half of the programme, which has been proven efficient and should be intensified in TAAT-2.

•Capacity development and outreach programmes: More innovative scaling approaches must be targeted to reach a broader population, such as the development of distance learning modules and programs for extension agents and farmers, phone Apps targeting farmers, and the involvement of the private sector.

•Monitoring, Evaluation and Learning: MEL must be defined prior to the start of the project, and sufficient resources must be allocated in time to monitor the programme's impact at country levels.

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