



**Food and Agriculture Organization
of the United Nations**

Ten years of the Ethiopian Agricultural Transformation Agency

An FAO evaluation of the Agency's impact on agricultural growth and poverty reduction

In February 2020, Ethiopia's Agricultural Transformation Agency (ATA) requested the Food and Agriculture Organization of the United Nations (FAO) to undertake an evaluation of the Agency's work, spanning almost ten years, on pursuing agricultural development and transformation in the country.¹ A taskforce was established to carry out the evaluation,² which sought to answer two interconnected questions:

- ▶ What is the impact of the ATA's interventions on smallholder household productivity and commercialization?
- ▶ How have the ATA's interventions affected agricultural growth and poverty reduction?

Providing answers to these questions would not only assess the impact of the ATA per se, but would also inform its future work for the next ten years. This would include providing strategic guidance and support to Ethiopia's Ministry of Agriculture (MoA) on investments that work best for the agriculture sector and smallholders, and on ways to improve the monitoring and impact evaluation of the Agency's future operation.

Key features and scope of the FAO evaluation

FAO's assessment of the extent of the ATA's achievements was guided by a "theory of change". Over the last ten years, the Agency supported the MoA and other partners in the agriculture sector in designing and delivering multiple agricultural development interventions, and in developing studies that influenced the design and policy orientation of agricultural projects. The ATA's support was characterized by a problem-solving approach, swift action, the inclusion of gender-sensitive approaches, and enhanced stakeholder coordination, covering an extensive amount of land and a large number of farmers through scaled-up investments.

The evaluation considered the following causal chain: first, FAO assessed the level of enhanced efficiency in both service delivery and the introduction of innovation as a result of the ATA interventions. The expected results would be a more efficient and productive agriculture system, impacting several key priority areas – access and enhanced utilization of agricultural inputs, extension services, irrigation, mechanization, and facilitation of market access. Then, FAO assessed the results of these inputs in terms of intermediary outcomes, namely, impacts on increased agricultural productivity of smallholders due to an enhanced environment for agricultural production, commercialization, and investment promoted by the ATA. Finally, FAO assessed the final outcomes of the aforementioned changes, which would lead to an increase in the growth of agriculture and that of other economic sectors, ultimately enabling poverty reduction.

¹ The ATA was established in 2010 as an "Accelerator Unit" supporting the Ministry of Agriculture of Ethiopia, with a mission to catalyse the sustainable development of agricultural value chains and markets, through promoting effective practices and approaches to address systemic constraints and coordinating the execution and integration of high-impact interventions at the farm level.

² FAO's Chief Economist appointed a taskforce within FAO's Agrifood Economics Division (ESA) to carry out the evaluation.

A **two-stage analytical approach** was undertaken based on the “theory of change”, comprising a micro-level analysis and an economy-wide analysis, which together helped build a counterfactual scenario in order to identify the ATA’s impact. This approach considered as outputs the two main actions of the ATA:

- ▶ studies undertaken to identify systemic constraints on agricultural development and recommend solutions to ensure sustainability and structural transformation;
- ▶ projects – implementation of the solutions recommended through specific studies.

The ATA has undertaken many strategy and policy studies as part of its monitoring and evaluation system. The studies (circa 250) have focused on designing and assessing the impacts of both policies and projects, and on several outcomes related to the Transformation Agenda. A number have focused on the implementation of the Agricultural Commercialization Cluster (ACC), the ATA’s flagship programme. Other studies have focused on, for example, individual value chain strategies, mechanization, seeds and inputs, irrigation, fertilizers and agricultural strategy.

In addition to the studies, the ATA has directly implemented 47 agricultural projects. The Agency’s main projects include EthioSIS (digital soil mapping/information), a farmer hotline, an input voucher system, a cooperative-based seed production project, direct seed marketing, an integrated shallow groundwater irrigation development project, and mechanization service centers. FAO’s evaluation focuses on 15 flagship projects (including EthioSIS) and the ACC programme.

TWO-STAGE ANALYTICAL APPROACH

The first stage of the analytical approach was a micro-level analysis or evaluation, which aimed to answer the first of the aforementioned questions. Underpinning this stage was a quantitative quasi-experimental evaluation that assessed priority area outcomes in ATA treatment areas against a counterfactual population that was never exposed to the ATA’s work. The micro-level analysis quantified the likelihood of accessing agricultural inputs and technologies, and the associated changes in agricultural yields and commercialization for ten priority crops. This stage provided impact estimates at agricultural household level across priority crops and agricultural systems.

The second stage of the analytical approach brought the results from the micro-level analysis to an economy-wide modelling framework to measure the ATA’s impact on the economy overall and its multisectoral functioning. The economy-wide modelling framework was used to develop scenarios for the 2012–19 period with and without the operation of the ATA. The scenario with the operation of ATA included the observed shifts in smallholders’ behaviour and output from the micro-level analysis, combined with operations information regarding ATA’s projects’ coverage ratios and spending. The output of this second stage (that is, the comparison of scenarios with and without the operation of the ATA) resulted in an estimation of ATA’s overall impact on the Ethiopian economy as a whole, and its role in reducing poverty nationally but also in urban and rural areas.

THE FOCUS OF FAO’S EVALUATION

Priority systemic area	Outputs (studies and projects)		Cross-cutting initiative
1. Seeds	Input Voucher System (IVS) Agricultural One Stop Shop (AOSS) Wheat Initiative	Direct Seed Marketing (DSM) Cooperative Based Seed Production Project (CBSP)	Agricultural Commercialization Clusters (ACC)
2. Fertilizer	Input Voucher System (IVS) Agricultural One Stop Shop (AOSS) Wheat Initiative	EthioSIS	Agricultural Commercialization Clusters (ACC)
3. Agrochemicals	Input Voucher System (IVS) Agricultural One Stop Shop (AOSS) Wheat Initiative	EthioSIS	Agricultural Commercialization Clusters (ACC)

Priority systemic area	Outputs (studies and projects)		Cross-cutting initiative
4. Extension/ advisory services	Agro-met Re-engaging Senior Agricultural Researchers Project (RESARP) Cooperative storage pilot (CSP)	Farmer Training Centers (FTC) Teff improvement project (TIP) EthioSIS	Agricultural Commercialization Clusters (ACC)
5. Irrigation	Integrated Shallow Groundwater Irrigation Development (ISGWID)	Sustainable Household Irrigation Value Chain Development (SHII-VCD)	Agricultural Commercialization Clusters (ACC)
6. Mechanization	Mechanization service centers (MSC) enhancement		Agricultural Commercialization Clusters (ACC)
7. Markets	Farmer production clusters/ Acceleration full package (FPC-AFP) Wheat Initiative	Commercial Farm Service Centers (CFSC)	Agricultural Commercialization Clusters (ACC)

Source: FAO.

Data availability enabled the evaluation to identify impacts for the ATA's overall interventions, according to the systemic priority areas (seeds, fertilizers, agrochemicals, irrigation, mechanization, markets and extension and advisory services) and priority crops (wheat, maize, teff, barley, sesame and horticulture). The impacts of the ATA's studies, implementation support and linkages and coordination activities – which are beyond the scope of the selected projects – were not included in the quantitative analysis for this evaluation.

Impact of the ATA on agricultural household production strategies

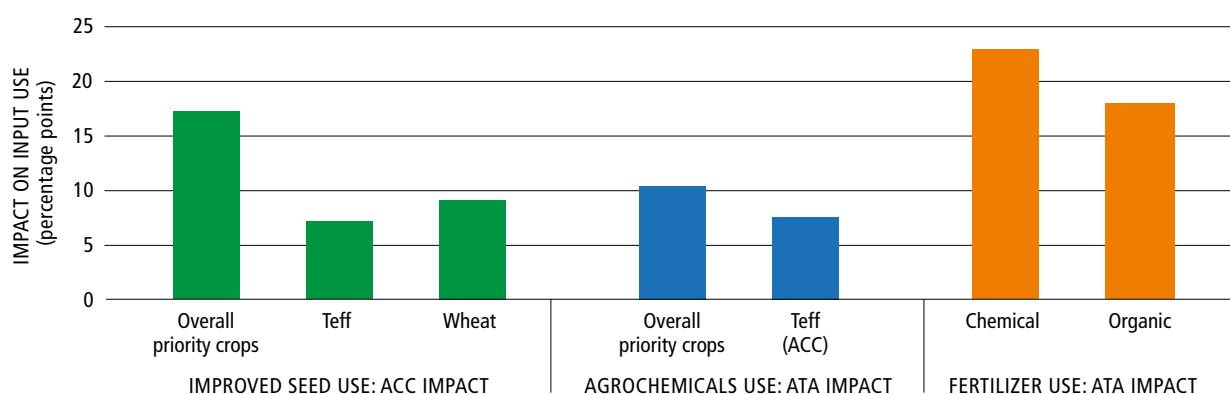
ROLE OF THE ATA IN SMALLHOLDERS' ACCESS TO AGRICULTURAL TECHNOLOGIES AND PRODUCTIVITY

At the core of FAO's overall evaluation of the ATA lies the micro-level analysis. This part of the evaluation took advantage of the extensive information on agricultural activities provided by the nationally representative Ethiopia Socioeconomic Survey (ESS), and paired it with project and initiative implementation data from the ATA. This allowed the total impact of the Agency's interventions from 2012–19 to be estimated. Using the available data, the micro-level analysis helped assess the ATA's impact on the likelihood of using modern agricultural inputs (improved seeds, agrochemicals, chemical fertilizer), resources (extension services) and technologies (mechanization, irrigation) as well as on yields and commercialization of ten priority crops.

The evaluation found that the ATA had achieved many of the outcomes it was being measured against, in terms of **input use, extension services, and agricultural technology**. The outcomes observed point to the effective removal of bottlenecks in the rural agricultural economy that have improved the linkages between producers, input markets and agricultural services. The improvements in those priority areas are reflected in productivity gains for certain priority crops and in market orientation positions that confirm the ATA's effectiveness in connecting producers to markets. The impacts documented by this evaluation are heterogeneous, a reflection of the unique context surrounding each crop's production environment.

The use of both **organic and chemical fertilizers** expanded as a result of the ATA. The likelihood of organic fertilizer use by households producing priority crops rose by 18 percentage points, whereas for chemical fertilizers it rose by 23 percentage points. The **EthioSIS initiative** has been the central input to produce new, geo-referenced, crop-specific fertilizer recommendations for producers across the country. Agricultural households' use of nitrogen phosphate sulphur (NPS) fertilizer for priority crop production was over five times more likely due to the ATA intervention, and over ten times more likely due to ATA fertilizer and extension projects, when compared with not using any chemical fertilizers. These treatment effects are 1.5 to 3 times greater than for the use of only diammonium phosphate (DAP) and/or urea fertilizers, suggesting that ATA projects were a transmission mechanism for the EthioSIS-informed fertilizer recommendations.

ATA AND ACC IMPACTS ON ACCESS TO AGRICULTURAL INPUTS



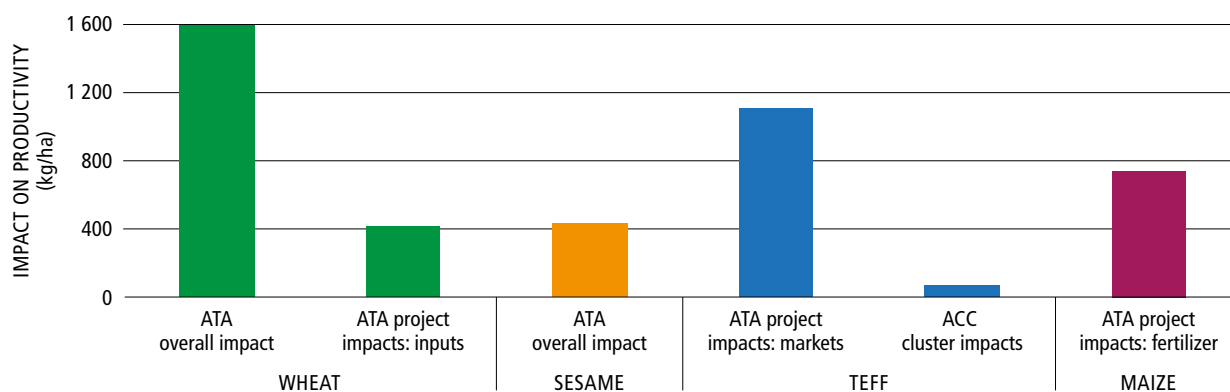
Source: FAO.

The effects on **agrochemical and improved seed use** emerged as less striking than those for fertilizers; however, the market environment for such inputs is different from that for fertilizers whose supply is sourced from government imports and is increasingly expected to be domestically produced in blending factories located in each of the four priority regions. The ATA was found to increase the likelihood of agrochemicals use by slightly more than 10 percentage points, which could be a reflection of rising demand for herbicides in lieu of crop rotation as smallholders tend to rely on less-diverse production portfolios.

For **improved seeds**, significant impacts emerged only for the ACC initiative, which was found to increase the likelihood of their use by 15 percentage points among households producing priority crops, due to a greater share of households using them for teff and wheat production. The growth in demand for improved seeds, as for agrochemicals, is linked to projects such as Cooperative-Based Seed Production, Direct Seed Marketing and Agricultural One Stop Shops, which have sought to improve production and the distribution of improved seeds. The Input Voucher System project, which most recently has initiated linkages to improved seeds in Tigray and Oromia, is also seeking to alleviate the liquidity constraints that limit their use. The results point to the potential to expand the share of agricultural households accessing these seeds, in the context of greater innovation and dissemination of improved seed varieties across a broad range of crops. The analysis linking systemic priority areas and crop productivity provided evidence of the linkages between shifts in input use and production practices that shifted **productivity**. Shifts in the fertilizer portfolio, linked to the EthioSIS initiative, improved yields for priority crops overall, and specifically for maize,³ teff and wheat. Since EthioSIS fertilizer recommendations have been mobilized through information dissemination via **extension and advisory services**, the results point to the importance for yields of filling knowledge gaps and supporting on-farm decision making.

Exposure to projects addressing improved seeds, fertilizer and agrochemicals was found to improve yields for wheat. For this crop, yields were found to approximately double on average, improving returns by 1 593 kg/ha. The treatment effects for wheat could be anticipated, as the crop was the subject of two crosscutting interventions: The Wheat Initiative and the ACC wheat clusters.

ATA AND ACC IMPACT ON PRODUCTIVITY



Source: FAO.

³ Maize is single priority crop for which sufficient observations enabled to identify the impact of fertilizer use intensity across treatment status.

ACC teff clusters were linked to higher yields for teff, due to the greater likelihood of improved seed and agrochemical use in this crop's production, which emerged from the ACC clusters. For the subset of teff-producing households in ACC teff cluster areas, exposure to the cluster-specific interventions was found to contribute to 35 percent greater yields - or approximately 69 kg/ha. However, the ATA's impacts were not equal across the stock of teff-producing households in treatment areas. Instead, larger-scale producers with stronger market linkages and/or greater production diversity were found to be more likely to gain from the interventions. For example, among the subsample of households exposed to market priority area projects teff yields increased by 38 percent - a gain that instead represents 1 124 kg/ha - suggesting the importance of market access to optimize returns from the ATA's support.

From a commercialization standpoint, the ATA's work to remove bottlenecks that limit market access proved effective as treatment area households became more engaged with markets. The share of harvested output sold on the market grew significantly for teff and to a lesser extent for barley and wheat as a result of the ATA's overall interventions. Narrowing in on market-specific projects revealed that commercialized shares also grew for fruit-tree crop producers. The degree to which commercialization impacts emerged from the ATA's work is asserted to be linked to the extent to which value chains for each crop are developed. For certain crops, the ATA strengthened market orientation, with greater shares of output sold on the market, even if the Agency did not impact production or yields for those crops. This outcome indicates that the ATA's support in removing market bottlenecks helped producers face a more favourable environment for engaging in value chains for marketable priority crops.

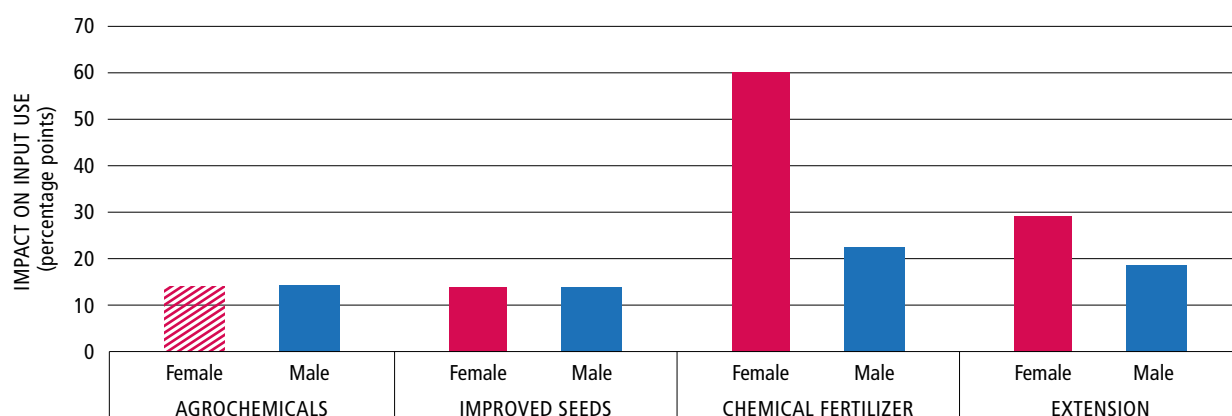
ROLE OF THE ATA IN REDUCING GENDER INEQUALITIES IN AGRICULTURE

The operational work of the ATA is designed to be gender-sensitive in its implementation and its results. The Agency indicates that most projects seek to meet national targets of at least 30 percent participation of female beneficiaries, pursued through the explicit targeting of certain interventions towards women. Indeed, agricultural households headed by women in Ethiopia produce significantly smaller quantities of land than those headed by men, with fewer units of working-age adult labour and fewer units of livestock.

FAO's micro-level evaluation found that female-headed households disproportionately gained from priority area interventions related to fertilizer and extension, but not from the rest of the priority areas. The disproportionate gains to female-headed households from fertilizer and extension interventions are indicative of the ATA's successful targeting within its gender prioritization strategy, and of the underlying demand among female-headed households for improved access to these resources.

However, higher effects for improved seeds and agrochemicals use did not emerge for female-headed households, or were not significantly different across male and female headship. For these indicators, male-headed households were equally or significantly more likely to benefit from the ATA interventions. Furthermore, yield effects were not found to differ along gender lines, which reflects in part the lower likelihood of female-headed households to cultivate certain priority crops, particularly teff, but also wheat. These differences could reflect the commercialization potential of the respective crops.

ACC IMPACT ON ACCESS TO INPUTS, BY HOUSEHOLD HEAD GENDER



Note: Dashed bar denotes impact was not significant at 95 percent confidence level.

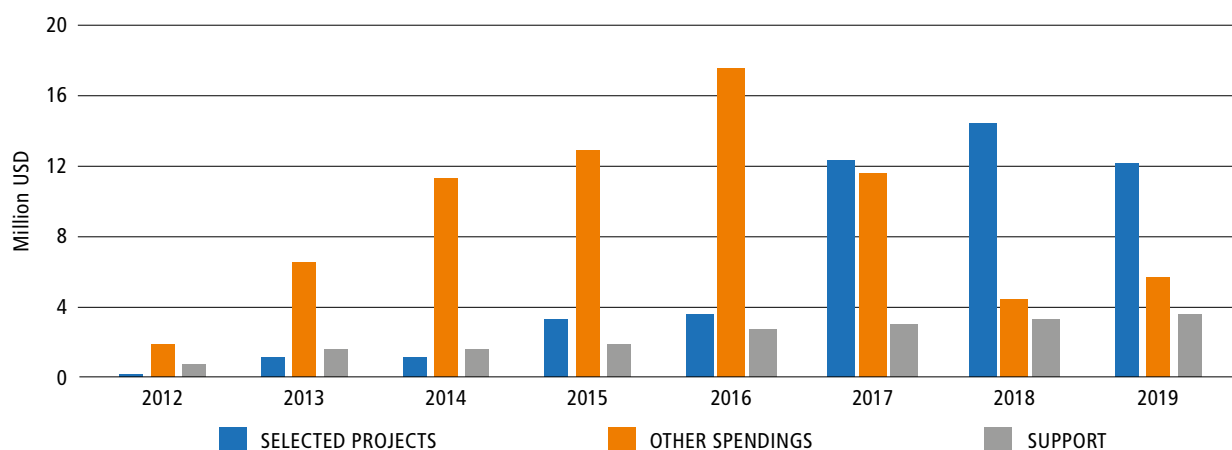
Source: FAO.

The issue of crop choice and production strategies is defined by a myriad of factors not limited to agroecological conditions, access to seeds, labour availability and concomitant livelihoods activities. Nevertheless, the differences across gender raise the question of how smallholder producers define their crop portfolios, and which mechanisms can be employed to expand or diversify production portfolios in order to promote an inclusive production landscape in the context of a gender prioritization strategy.

Contribution of the ATA to economic growth and poverty reduction

The productivity gains that the ATA has helped generate have been enabled through the stepping up of spending for interventions in priority areas and crops.⁴ Based on information provided by the ATA, most of the Agency's spending on the selected projects considered in FAO's evaluation took place during the period 2017–19. Overall, the total 2012–19 spending considered in the economy-wide analysis of ATA impacts was USD 138.9 million, with 13.4 percent (USD 18.6 million) spent on support functions and overheads.⁵ But the analysis takes into account the fact that the ATA's spending began to increase very gradually in 2012 and was notably scaled up only from 2017; hence, the economy-wide evaluation – for which this spending is an important aspect – focused on the growth of key macro aggregates for the 2013–19 period.

ATA EXPENDITURES – TOTAL FOR ALL PROJECTS WITH DATA ON COST



Source: FAO.

The main upshot of the economy-wide evaluation is that the ATA's operations have brought about economic and social payoffs beyond what the Agency's interventions had actually targeted. Understanding the extent to which the ATA has contributed to the economy at large and to reducing poverty at the national level is particularly important if one considers that Ethiopia's gross domestic product (GDP) growth has been steadily losing steam since 2013. The positive economy-wide impact of the ATA's operations has contributed to reducing the slowdown in GDP growth.

ROLE OF THE ATA IN ETHIOPIA'S ECONOMIC GROWTH

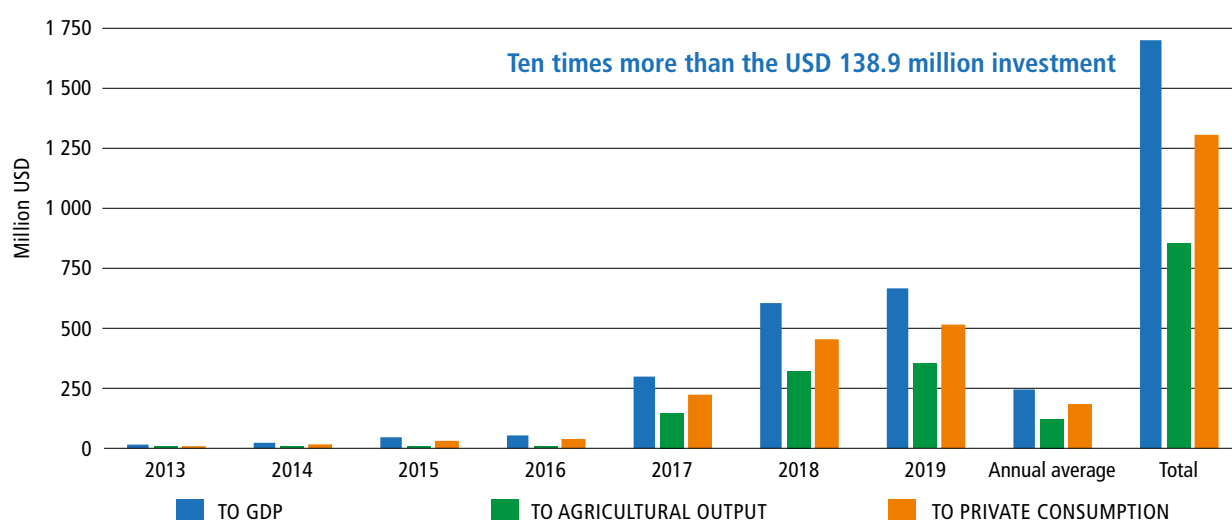
In every year during the period 2013–19, **the level of GDP** was on average 0.30 percent (or USD 243 million) higher due to the productivity effect triggered by the spending associated with the ATA interventions in the priority areas and crops covered by the FAO evaluation. These gains were much higher towards the end of the period, when spending was stepped up most significantly, which brought about more impactful productivity gains. Thus, the level of GDP in 2019 was 0.75 percent (or USD 666 million) higher as a result of the ATA's interventions. As a whole, the ATA contributed USD 1.7 billion to GDP during the 2013–19 period. Also, the ATA interventions increased private consumption by a total of USD 1.3 billion during the same period.

Faster growth in priority crops as a result of the ATA interventions stimulated additional **growth in the non-agricultural sectors**. The demand for priority crops has risen as their prices have fallen given the increase in their supply, not only that of the final consumer, but also that of other actors downstream along food supply chains who are using more of those crops as intermediate inputs for food processing. As household income also increased, not only could they consume less costly priority crops, but also more non-agricultural products. Consequently, the GDP for the overall food-processing sector rose gradually – in 2019, for example, it was 1.3 percent higher as a result of the ATA interventions. Increased production of priority crops was also found to generate additional demand for chemicals and transport services, which further stimulated growth in other manufacturing and service sectors.

⁴ All the ATA interventions in the economy-wide analysis include crop-specific ACC clusters; seeds, fertilizers and agrochemicals priority areas; markets priority area; extension priority area; and fertilizer priority area.

⁵ This figure does not include USD 20.1 million of funding provided by donors to the United Nations Development Programme (UNDP) and the World Food Programme (WFP) during this study period to hire international staff consultants and provide corporate-level support to the ATA. Due to the nature of these expenditures, which do not represent support functions and overheads on the ground with direct effects on productivity, they are not a part of the economy-wide assessment.

WHAT ATA'S OPERATIONS HAVE CONTRIBUTED TO ETHIOPIA'S ECONOMY



	2013	2014	2015	2016	2017	2018	2019	Annual average
Of GDP	0.03%	0.03%	0.06%	0.08%	0.39%	0.74%	0.75%	0.30%
Of agricultural output	0.01%	0.01%	0.05%	0.06%	0.67%	1.42%	1.48%	0.53%
Of private consumption	0.03%	0.04%	0.07%	0.08%	0.38%	0.72%	0.75%	0.30%

Source: FAO.

Private consumption and investment were critical drivers of such GDP growth gains, particularly during the period with the highest ATA spending (2017–19). But other macroeconomic aggregates also seem to have evolved better as a result of the ATA, particularly in the area of **trade**. For example, the ATA interventions mostly increased the exports of food products and imports of non-food products, with the Agency making a significant contribution to enlarging the creation of value added along value chains. In turn, the findings show a relatively large decrease in the imports of food products – even if wheat imports could not have declined to fully accommodate boosted domestic supply of wheat due to, for example, the existence of a quota. For instance, imports of processed foods, on average, decreased by as much as 1.4 percent.

ROLE OF THE ATA IN ETHIOPIA'S EMPLOYMENT CREATION AND POVERTY REDUCTION

"Moving up" the real economy in such ways would have not been possible without increasing the use of factors of production in general, and labour in particular. The labour market is, and will continue to be, increasingly important for Ethiopia, given the size of its growing population and a context of increasing land scarcity and fragmentation. Expanding employment opportunities, particularly outside farming, is a key area for the Government, as reflected in the second Growth Transformation Plan (GTP-II). More specifically, due to the aforementioned favourable economic effects on non-agricultural sectors, the operation of the ATA contributed to creating a total of 11 000 jobs in the 2013–19 period.

BY 2019, ATA'S OPERATIONS HAD CONTRIBUTED TO CREATING THOUSANDS OF JOBS AND LIFTING THOUSANDS OF PEOPLE OUT OF POVERTY

	2013	2014	2015	2016	2017	2018	2019
Jobs	1	2	3	3	7	5	11
Rural poverty	16	21	29	34	118	199	210
Urban poverty	4	5	8	9	43	73	76
Total poverty	20	25	37	44	162	273	286



Note: This is the average cost of moving people out of poverty across all years. The total cost from 2013 to 2019 will be USD 485*286 000 people moved out of poverty, i.e. USD 138.9 million.

Source: FAO.

Productivity gains from the ATA interventions resulted in wage growth in agriculture (therefore, higher household income) and in a reduction in food prices that, combined with the employment creation, resulted in a considerable effect on **poverty reduction**. The number of rural and urban poor individuals shrank by about 210 000 and 76 000, respectively, by the end of the evaluation period.

ATA'S COST EFFECTIVENESS

In the face of such results, the investments by the ATA are found to have been largely cost effective. With a modest total effective project spending of USD 138.9 million since 2012, the ATA boosted GDP and private consumption by USD 1 700 and USD 1 308 million over the period 2013–19, respectively – compared with a counterfactual situation in the absence of ATA interventions. The ATA's impact on the national economy over the period 2013–19 is thus ten times higher than its cost. This is indicative of the cost-effectiveness of ATA projects in their own right, but also through the economy-wide effects they have triggered. The cost of the ATA interventions in terms of poverty reduction, over the seven-year period, is USD 485 per person per year, with a cumulative number of individuals exiting poverty by 2019 of about 286 000.⁶

Recommendations

Through a rigorous, multi-stage analysis, FAO's evaluation has demonstrated the effectiveness of the ATA's business plan for achieving measurable changes in Ethiopia's agriculture sector, at both micro and economy-wide levels. The assessment also identified areas for renewed and refined emphasis, as well as strategies for the future planning and monitoring of the ATA's work.

In particular, value addition could be maximized through the fine-tuning of interventions to expand inclusiveness, not only in terms of gender, but also in terms of producers who are at the margin for taking advantage of the ATA's interventions. Tailoring strategies to the different needs of producers in recognition of their constraints and risk aversion would have potential for further maximizing the take up of modern agricultural production practices.

Drawing linkages to other policies outside the agriculture sector has the potential to further enhance the ATA's poverty reduction footprint, especially as most small-scale producers in Ethiopia are more likely to exit poverty through the labour market of other sectors that gain from improvements in agricultural productivity, which the evaluation demonstrated are not insignificant. Future priorities could thus enhance supporting the adoption of agroterritorial approaches in rural development planning and infrastructure investments, and designing interventions that consider the agriculture sector as one component of a broader agrifood sector.

Finally, the gains from any strategy refinement could also be adequately monitored and assessed through the scaling up of data collection practices in such way that is representative of the ATA's interventions and builds a counterfactual scenario, and record keeping for existing and pipeline interventions, which would enhance the ATA's monitoring and evaluation systems and enable assessments of even greater rigour to be undertaken. FAO's evaluation of the ATA would have been even more comprehensive if adequate data to assess the ATA's impacts at both farm/household level and economy-wide level had been available. Bridging such data gaps should be a major priority for the ATA moving forward if a better structured and more precise and robust evaluation is envisioned in five to ten years' time.

Similarly, future efforts by the ATA need to identify and document the key processes and institutional changes that are required for interventions to work, particularly for scaling up successful interventions promoted by the Agency. Evidence and information relating to initiatives and processes that did not work well should also be properly documented so that lessons learned can be derived from the Agency's operation. Doing so will facilitate not only evidence generation, but also the effectiveness of scaling up interventions to transform Ethiopia's agrifood system.

⁶ Therefore, multiplying 286 000 by USD 485 results in the total effective project spending of USD 138.9 million since 2012.

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The full FAO report *Ten years
of the Ethiopian Agricultural
Transformation Agency: An FAO
evaluation of the Agency's impact
on agricultural growth and
poverty reduction* is available at
<https://doi.org/10.4060/cb2422en>

