INVESTMENT PLANNING FOR SUPPLY TO AGRO-INDUSTRIAL PARKS
LESSONS FROM SUB-SAHARAN AFRICA

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Agricultural production in sub-Saharan Africa tends to be scattered and informal, which hampers commercialization and value addition. Often, not enough supply of the right quality reaches food processors at the right time. Value chains are often unstructured and uncoordinated, which increases dependence on middlemen and local buyers who often have insufficient capital for bulking and do not pass on marketing signals to farmers. Therefore, incentive structures are poorly aligned. However, these supply chains operate in a context of booming commodity demand. Sub-Saharan Africa still has huge potential to increase both production (expanding the area under cultivation) and productivity (higher yields).

Quality improvements are also needed to meet global food safety standards. There is the opportunity to significantly reduce post-harvest losses by improving infrastructure and value-chain coordination. Agro-industrial parks (AIPs) can overcome the challenges mentioned above by attracting investment and driving local demand, while improving links between value-chain actors. This helps to restructure markets, boosting production, productivity and quality.

This brief features some of the models being applied to meet the challenges of increasing production and organizing stronger supply chains to bring raw materials to these parks. It will present nine key take-home messages, drawn from concrete experiences in Ethiopia, Côte d’Ivoire, and Zambia. The brief demonstrates how a sound investment planning process is needed to identify the capital requirements for expanding and upgrading the areas around the parks. It analyses the ongoing costs of capacity development. The brief also explores the process of monitoring investment implementation. Investment plans for agro-processing zones allow governments to demonstrate to potential investors both their existing production and aggregation capacities and the critical areas where additional private-sector skills and investment are needed.
What is an agro-industrial park and which models are being promoted in Africa?

An AIP can be defined as a geographically demarcated area that provides infrastructure to support agro-processing and related activities (Food and Agriculture Organization of the United Nations - FAO, 2017). A park is more than just physical assets. It aims to be a functional community of agro-processing firms and agribusiness services located on one site, centrally managed by a dedicated body which may public, private or a public–private partnership (FAO, 2017). The fundamental assumption is that organizing the proximity of agro-processing firms to raw material production areas will allow agricultural producers, aggregators, processors and distributors to reduce transaction costs and share business development services that help to increase the productivity and competitiveness of the industry as a whole (African Development Bank - AfDB, 2016, 2017). In countries such as Côte d’Ivoire, Ethiopia and Zambia the development of integrated agro-industrial parks (IAIPs), also known as agro-poles or agro-processing hubs, is expected to drive the modernization of the agriculture sector by creating permanent linkages between production and industry. The concept of building the supply base for agro-processing is not new in Africa. Estate farms and plantations for cash crops (e.g. tea, sugar cane, palm oil) were promoted in the 1960s. These models have evolved over time. Companies, governments and development partners have pursued various territorial approaches including growth corridors and clusters (as promoted by the World Bank) and special agro-processing zones and hubs promoted more recently by the AfDB in Chad, Gabon, Mozambique, Nigeria, Senegal, South Africa and Togo. However, it is important to note that particularly in Africa these integrated parks are a recent phenomenon with limited examples in the region. While much research has examined the pros and cons of various territorial models (e.g. FAO, 2017), this brief uses concrete examples from Côte D’Ivoire, Ethiopia and Zambia to highlight some common challenges and opportunities of organizing the supply side of IAIPs.
INTEGRATED AGRO-INDUSTRIAL PARKS – ETHIOPIA

In 2015 the Government of Ethiopia initiated a policy on IAIP development. Based on feasibility studies of growth corridors and the potential for agribusiness development, 17 locations were identified. IAIPs were conceived as one-stop centres for services (including electricity, water, business registration and a wide array of infrastructure) surrounded by Agro-Commodity Procurement Zones (ACPZs, or production zones) within a 100 km radius of the park. The core function of the ACPZs is to produce and supply raw materials for the agro-processing firms located in the park.

The supply chains envisaged include facilities for coordinated collection from farm gate called Primary Collection Centres (PCCs), located at community (kebele) level, where farm output is aggregated and quality assurance begins. PCCs then deliver aggregated raw materials either to Rural Transformation Centres (RTCs) located at district (woreda) level for further consolidation and primary processing, or direct to agro-processing firms in the parks. These facilities could be new or pre-existing and their structure may vary slightly between the commodities being aggregated. The flow and aggregation streams are shown in Figure 1. The market infrastructure and associated institutions aim to improve the flow of agricultural product to agro-processors in the park, thereby reducing post-harvest losses and improving market access for smallholder farmers. Employment generation is also envisaged, by stimulating small and medium-sized enterprises (SMEs) operating in the midstream of the value chain. For example, PCCs would be operated by SMEs or farmer cooperatives, and RTCs by a recruited company or designated authority. SMEs would also be involved in input supply, machinery and logistics services along the value chain.

Figure 1
The IAIP development concept in Ethiopia: linking agriculture to agro-industry

Source: FAO, 2019c

Four pilot parks: Bulbula (Central Eastern Oromia), Baeker (Western Tigray), Bure (south west Amhara) and Yirgalem (Eastern Southern Nations, Nation-aliities and People’s Region) are being developed in the first phase (2020–2025). Two leading commodity chains, and three to five “additional” commodity chains with high potential for production and processing were identified for each ACPZ based on consultations with companies interested in settling in the parks, and priorities identified by regional governments and other stakeholders. The lead commodities are wheat and dairy (Bulbula), sesame and sorghum (Baeker), wheat and maize (Bure), and coffee and avocado (Yirgalem). These chains are expected to drive the overall development of the production zones. They will also pull the development of the secondary commodities through shared infrastructure, increased capacity of public and private actors operating in the lead commodity chains, and greater availability of market information and financing.
FEED AFRICA STRATEGY
The “Feed Africa” strategy from the AfDB promotes a similar approach to the model discussed above, albeit using the terms “Staple Crop Processing Zones (SCPZ)” and “agro-processing hubs”. It aims to help transform African agriculture by 2025, reversing the continent’s dependence on imported foods (AfDB, 2016). It calls on the private sector (domestic and international) to work in partnership with national governments, farmers and their organizations, and other important stakeholders in the value chains.

At the aggregation level, the AfDB approach promotes Agricultural Transformation Centres (ATCs), linking small-scale farmers to processors in the park by providing aggregation and primary processing services at community level, as well as other demand-driven services such as input supply and access to credit. The ATCs serve the same function as the PCCs in Ethiopia. The design of each ATC will differ depending on the specific context and needs of the value chains and communities it serves, but as in Ethiopia, the aim is to capitalize on existing (and grow new) private sector involvement in the midstream of the chain, by supporting the development and upgrading of SMEs and farmer cooperatives. In 2018, AfDB was promoting the development of SCPZs and ATCs in Côte d’Ivoire, the United Republic of Tanzania and Zambia.

When is an agro-industrial park an appropriate strategy?
While the theory behind IAIPs is strong, few well-functioning examples exist in developing regions (although there are some limited examples in China and India as well as in Europe, the United States of America and Canada). For policy makers the construction of physical infrastructure seems easiest to address. Other tasks are more challenging, such as increasing production and organizing the supply chain, ensuring that physical infrastructure matches the needs of processors and specificities of the value chains, and guaranteeing that the desired amount of quality produce is available at the right time. Attracting private-sector anchor investors to the park is a crucial first step. This must be followed by developing financing mechanisms that secure investment into key segments of the agricultural value chains which require upgrading as suppliers of raw materials to the parks.

KEY MESSAGE 1
Agro-industrial parks are appropriate strategies for governments who wish to increase value-added agriculture, create jobs and other benefits at the local level.

IAIP development is a strategy to add value to raw agro-commodities through processing, across several agricultural value chains in a demarcated territory, especially where the private sector is adequately developed and interested to support this approach. However, governments must be aware of the complexities of developing agro-industrial parks and the detailed supply-side and investment planning needed to secure financing and achieve related productivity targets in production zones.
Developing investment plans to increase agricultural supply to agro-industrial parks

TEN STEPS FOR INVESTMENT PLANNING TO INCREASE SUPPLY: LESSONS FROM ETHIOPIA

In 2019, the Ethiopian Ministry of Finance asked the FAO Investment Centre and the FAO Ethiopia Country Office (with financial support from the European Union and in coordination with United Nations Industrial Development Organization - UNIDO and other partners) to develop Investment Plans (IPs) to increase production and improve supply chains of lead commodities at four pilot parks. The IPs included: (i) setting key targets for production, productivity, post-harvest management, marketing, and institutional and capacity development to reach the required amounts of supply; (ii) gap analysis of ongoing projects and investments; and (iii) costing of the critical interventions. Figure 2 shows the steps carried out in Ethiopia, during a year of investment planning, stakeholder dialogue and government consultation. While the supply model as described above was relatively fixed, some degree of flexibility was introduced to account for territorial differences and different needs of different commodities. Figure 2 summarizes the steps taken to develop the IPs.

Baseline data was collected on the infrastructure, logistics, institutions, land use patterns, and social and livelihoods systems in the area. Rural appraisal methodologies can be used and information captured with Global Positioning System (GPS) to produce maps which facilitate planning. Each territory presents different opportunities for land expansion or conversion, different supply chain structures (middlemen, informal or organized markets), strong or weak cooperatives, and farmers of different capacities. Additional technical studies provided insights into the macro-economic context of the area. Specifically, a General Equilibrium Model showed that the highest returns on public investment would arise from feeder road development and irrigation, and an Agricultural Public Expenditure Review (AgPER) identified the levels of public financing directed towards each geographic and thematic area – this analysis showed a bias of public expenditure towards production activities, with limited attention to value addition, marketing, processing and institutional development.

Figure 2
Steps for IAIP investment planning
Source: Author’s compilation
Investment mapping
Ongoing aligned projects and interventions were mapped. While donor and non-governmental organization (NGO) projects have pre-defined objectives, financial envelopes and methodologies, private sector projects are less predictable and it is more challenging to obtain concrete information. Projects which did not align with the development pathway proposed under the IPs were excluded, although it was recommended that the investments be re-aligned towards the IPs at a later stage. Apart from large-scale water and irrigation schemes, the public investments identified were mainly recurrent ones, reducing the funding availability for development. Although the project mapping was indicative at best, it did identify lessons learnt, scalable models, and gaps in the focus of ongoing projects. It identified that USD 420 million of an estimated USD 1.3 billion required were already available and could be re-oriented to develop the four ACPZs (as elaborated below). This corresponded to 35 percent of the requirement in Bulbula, but only 8 percent of that in Baeker. Overall, only 11 percent of the ongoing financing was targeting post-production segments of the value chain.

Capacity assessments
The capacity of stakeholders on the ground to implement the IPs is paramount for the development of the production zones and ultimately for the success of the park. This includes the capacities of decentralized government entities, including regional governments and extension workers, as well as farmers, their institutions and the private sector. Private sector stakeholders include those operating within the park and outside of the park within the demarcated production zones; they may range from international processing companies to unemployed youths setting up SMEs to act as service providers. The limited ability of the extension and research system to provide bottom-up, participatory and value-chain-specific capacity building to farmers was identified as a bottleneck restricting productivity increases; this therefore received particular attention in the IPs.

Value chain selection
Under the lead commodity approach, the Government of Ethiopia identified long-lists of potential commodities to be selected for investment. Based on these, lead and secondary commodities for initial investment were found through consultations with the private sector, with farmers and with the regional government. The business case for investing in upgrading of the lead commodities selected (from the farmer’s perspective) was also discussed and agreed by stakeholders before a commitment to the final list of lead commodities was made. While best practice has been to engage in this discussion and to identify investors to co-create the parks, private sector commitment was declining in Ethiopia and domestic and international market trends became the driving force when estimating demand for the selected commodities.

Value chain analysis
For each lead commodity a detailed value chain analysis of the existing market was used to inform the production, productivity, post-harvest and marketing targets which were set as the basis for identifying investment needs. Existing commodity flows (including buyers’ locations) were mapped and detailed recommendations were made on the location and structure of the PCC and RTC functions needed to aggregate and distribute raw materials. In some cases, new structures were to be constructed, while in others existing structures and institutions could be used. For some commodities transport corridors and processing hubs already exist (e.g. wheat); for others, these have to be strengthened. For perishable goods, shorter value chains are needed. Ideally, an estimate of demand from processors in the park is needed to match with the supply targets set. This was possible for some commodities (e.g. maize for starch processing) based on existing park tenants but was not possible for all of the commodities identified – simply because investors had not yet settled in the parks or clearly expressed their demand. In such cases, demand was estimated based on an analysis of domestic, regional or international demand for the commodity. For this reason it is important to note that any strategy for a lead commodity must be flexible and focus on public goods which may primarily benefit one value chain, but can also strengthen aspects of other value chains (e.g. bulking and storage infrastructure) and the agricultural sector as a whole.
Identification of scalable models
Approaches which have been tried and tested in each specific environment are promoted and upscaled in the IPs. For example, the Agricultural Commercialization Cluster (ACC) approach has proven successful for aggregating produce, while various contract farming programmes in Ethiopia have contributed substantially to increasing both production and productivity of cash crops. Each future intervention to be implemented should be based on this successful approach. Approaches such as conservation agriculture and sustainable mechanization practices are critical to the long-term sustainability of interventions but should be piloted and adapted, especially as agriculture commercializes and the production of cash crops expands.

Development framework and targets
The development framework is the backbone of the IP. It is based on a theory of change and requires the identification of outputs and outcomes. Clear targets are set for high-level indicators of increased produce availability and are calculated backwards to understand which parts of the increment may be achieved through production increases, productivity gains, reduced post-harvest losses or formalized marketing. These targets are based on realistic assessments of what can be achieved using various production methods. Examples include productivity increases from using good agricultural practices or improved inputs, or the reduction of post-harvest losses through improved storage capacity and types of storage. Table 1 provides a snapshot of the development framework and the associated targets for wheat in Oromia and avocado in Yirgalem. Once these targets have been consolidated with other parts of the investment plan, the targets and related gaps are shown in the first five columns of Figure 3 (see below), along with the rows of detailed activities, outputs and outcomes.

Table 1
Development framework for production zone development (with a snapshot of the key interventions adapted from the Ethiopia ACPZ Investment Plan)

<table>
<thead>
<tr>
<th>Increasing production and productivity</th>
<th>Commercialization through formal channels</th>
<th>Institutional strengthening of public and private organizations</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Outcomes</strong></td>
<td><strong>Outcomes</strong></td>
<td><strong>Outcomes</strong></td>
</tr>
<tr>
<td>• Production increase from 568 million MT/annum to 943 million MT/annum</td>
<td>• Post-harvest loss reduction from 20% to 4%</td>
<td>• Emergence of 203 new SMEs</td>
</tr>
<tr>
<td>• Yields increase from 2.3 MT/ha to 5.0 MT/ha</td>
<td>• Marketable surplus at 60%</td>
<td></td>
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<tr>
<td><strong>Outputs</strong></td>
<td><strong>Outputs</strong></td>
<td><strong>Outputs</strong></td>
</tr>
<tr>
<td>• Adoption rate of improved inputs from 66% to 80%</td>
<td>• Increase storage capacity from 600 million tonnes to 3 billion tonnes</td>
<td>• Specialization of extension workers, researchers, training of farmer and cooperative leaders, empowerment of women, capacity building of private sector operators</td>
</tr>
<tr>
<td>• Area under sustainable land management practices increased from 5000 ha to 84 000 ha</td>
<td>• At least 30% of crop aggregated through cooperatives</td>
<td></td>
</tr>
<tr>
<td>• Quality assurance of at least 50% of produce</td>
<td>• Quality assurance of at least 50% of produce</td>
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</tr>
<tr>
<td><strong>Outcomes</strong></td>
<td><strong>Outcomes</strong></td>
<td><strong>Outcomes</strong></td>
</tr>
<tr>
<td>• Production increased from 75 000 MT/annum to 410 000 MT/annum</td>
<td>• 300 000 MT/annum avocado marketed (up from 45MT/annum)</td>
<td>• More SMEs and extension workers</td>
</tr>
<tr>
<td><strong>Outputs</strong></td>
<td><strong>Outputs</strong></td>
<td><strong>Outputs</strong></td>
</tr>
<tr>
<td>• Adoption rate of modern inputs to increase from 27% to 87%</td>
<td>• 100% of mature avocado harvested (up from 70% of mature avocados)</td>
<td>• 2 Regional commodity platforms established</td>
</tr>
<tr>
<td>• Productivity under irrigation increased from 3.7 MT/ha to 33.6 MT/ha</td>
<td>• Adoption of national standards by 80% (up from 10% adoption)</td>
<td>• 75% of farmers accessing finance (up from 30% of farmers accessing finance)</td>
</tr>
<tr>
<td>• Piloting mechanized production</td>
<td>• Contract farming piloted on 11 000 ha</td>
<td></td>
</tr>
</tbody>
</table>
Identification of interventions

Once targets have been consolidated, specific interventions (and their scale) to reach those targets are established. Sets of activities are defined along the main strategies to be employed and each step is detailed and quantified. For example, to increase production, several sets of interventions are required: production of improved breeding stock (e.g. community-level seed multiplication by one women’s group in each village); improved input distribution networks (e.g. supporting the establishment of one SME agro-input dealer per kebele); or research by public institutions in Addis Ababa. All varieties promoted should be in line with market requirements. For provision of extension services, interventions included specialised training of public extension officers in the commodities selected for the ACPZs, introduction of a pluralistic system, promotion of the farmer field school approach, and promotion of digital tools for market, climate and advisory information. Large-scale intensification is promoted including the adoption of improved inputs, mechanization and irrigation, while still paying attention to sustainable land management practices.

To formalize market channels, i.e. to ensure that produce of the right quality reaches the buyers in a predictable and timely manner, different marketing channels were promoted including adoption of quality testing by middlemen and aggregation centres; contract farming; marketing contracts with licensed traders; upgrading of unions and cooperatives as well as strengthening youth SMEs. Significant investment was also budgeted for agro-infrastructure including storage, aggregation, pre-processing, roads and power.

A cross-cutting set of interventions addressed institutional development: from incubation and Business Development Services (BDS) for youth SMEs, upgrading of Farmer Training Centres (FTCs) and research centres, strengthening of financial service institutions, and improving value chain governance and ACPZ coordination through existing or new public–private partnerships or value chain platforms. These issues are discussed below in this brief.

Costing and financing

The identified interventions were quantified, costed and the nature of the intervention was identified (distinguishing effectively between public and private goods, including the degree of farmer co-financing of the investments expected, for example through the repayment of credit lines). Unit costs were sourced from existing project budgets or field work using standardized but realistic units, unit costs and quantities. Private goods were costed but excluded from the financing gap presented to government. The IPs do not substitute detailed project design, but are used as a basis for prioritization and investment planning and alignment for government and its partners. The costing corresponds to the last five columns of the IP as shown in Figure 3. A total investment of USD 1 315 million was identified (over five years), with USD 1 194 million being public goods; and USD 659 million already being available in the areas. As such, government and development partners are expected to finance an additional USD 535 million to adequately develop the supply side and attract private sector financing.

The (supply side) Investment Plan

The final IP table and accompanying text brings all the information together (in particular, targets and the structure of the development framework, and the costs and financial flows available) and presents the development pathway as a simplified but clearly interpretable table. It is shown in its entirety in Figure 3, but can be summarized into a single figure and productivity target. This is a strong communications tool for government and a basis on which development partners can align their financing and programming. For example, in Bulbula ACPZ in Ethiopia, it was estimated that annual wheat production could be increased by 40 percent (from 1.8 million MT/annum to 2.7 million MT/annum) and milk production could increase by 45 percent, at a total extra cost of USD 67 million in public investment over five years, including the potential reorientation of existing resources and projects towards the IP priorities.
One of the biggest challenges in the IAIP approach is how to coordinate supply from many highly fragmented farms. The purpose of the ATC is to address this issue. ATCs are intended to be community-based rural institutions providing a mix of hard and soft infrastructure and services to smallholders and SMEs. The aim is to reduce on-farm and post-harvest losses, improve quality, aggregate production, and create efficiency in transportation by linking ATCs to the IAIP for further value addition (FAO and AfDB, 2019). While several operating models may be appropriate depending on the value chain, regardless of the model adopted, the ATCs should be public sector enabled and private sector owned and operated. In practice, this means building on existing infrastructure and private sector involvement in the value chain where possible, to minimize investment costs and the risk of dependence on government support.

In 2018, the FAO Investment Centre, at the request of the AfDB’s Agricultural Finance and Rural Development Department, conducted a study to assess the feasibility of ATCs for selected commodities identified under the Feed Africa strategy for Côte d’Ivoire, the United Republic of Tanzania, and Zambia. Five regions and four priority commodity chains were targeted: Belier and Poro regions in Côte d’Ivoire (rice and horticulture), Morogoro and Manyara regions in the United Republic of Tanzania (rice and maize) and Northern Province in Zambia (maize and cassava). The study identified the mix of services and infrastructure needed to establish ATCs in each region, as well as associated investment costs and risks. Boxes 1A and 1B below highlight the feasibility analysis and the ATC model proposed for maize in Zambia. Boxes 2A and 2B then present the assessment and ATC model proposed for Côte d’Ivoire, highlighting how an ATC can be specifically designed to address post-harvest losses and initiate local processing for horticultural commodities.

FEASIBILITY ASSESSMENTS AND INVESTMENT PLANNING FOR ORGANIZING THE FIRST LINK IN THE SUPPLY CHAIN: ATC EXPERIENCES FROM CÔTE D’IVOIRE AND ZAMBIA

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Market potential: high. Maize is the most important staple food for the country and demand from the poultry industry is also strong. Zambia regularly produces a surplus and supplies maize to neighbouring countries. Dynamic international and regional markets exist with expected growth and potential for increased local processing.

Production capacity: high potential. The climate in the Northern Province is good, with regular rainfall and fertile soils. Land is widely available for increasing production. About 90 percent of production comes from low-productivity (2 MT/ha) smallholders. High post-harvest losses of 15 percent to 20 percent are due to poor harvesting, no grain cleaning and lack of storage.

Government policies: high levels of control over the market. The Food Reserve Agency (FRA) has captured up to 100 percent of output in recent years, but its mandate may be reverting to a buffer stock mission, creating opportunities for ATC development. Inputs are subsidized through a voucher system used to establish a network of private retailers in rural areas.

Private sector: Limited due to the historic role of the FRA and a lack of milling facilities in the province. Input retailers are well established but are highly dependent on the input subsidy programme.

Infrastructure and services: Storage infrastructure mostly belongs to the FRA; limited and underutilized storage at cooperatives. No bulk grain handling facilities in the province. Limited access to mechanization, high collateral requirements and interest rates limit access to finance.

Collective action: Value chain highly fragmented; lack of coordination between agencies representing farmers (Northern Province Cooperative and Marketing Union and Zambia National Farmers Union). A non-profit company is attempting to facilitate linkages between producers and buyers.

Main constraints to value chain development: FRA interference, lack of market access beyond FRA for farmers, no incentive to increase production. Weak capacity for collective action or value chain coordination, low levels of input use and mechanization.
**Scope:** Emphasis on increasing production by improving farmers’ access to inputs and extension services and acting as an aggregation point to reduce transaction costs and post-harvest losses through primary processing and storage. The ATC becomes an entry point for input suppliers and buyers to establish relationship with farmers (mixed-commodity ATC model proposed as most farmers grow both maize and soybean).

**ATC network:** To reduce initial investment and promote ownership in the communities, a network of small-scale ATCs will be established in two districts. Each ATC will build on existing underutilized storage facilities owned by cooperatives, linking them to local agro-dealers already operating in those districts. The ATC infrastructure network will be made up of 52 existing sheds, aiming to capture a total of 20,000 MT per year from farmers during the pilot phase, approximately 25 percent of the output from the two districts. An estimated 4000 growers could be involved, storing up to 5 MT per season.

**Services:** ATCs will act as distribution points for inputs; aggregation, primary processing (grain cleaning, moisture monitoring) and storage (hermetic bags); mechanization service (shelling and threshing machines, small tractors), transport and savings groups; training centre for financial literacy, extension services for producers to improve productivity and access market information.

**Ownership and management:** Two management models are proposed: (1) the ATC leases existing cooperative-owned warehouses at a fee; (2) the cooperative is a minor shareholder in the ATC, warehouses are used for free, but the cooperative will earn dividends. A facilitator for the ATC network will be required and a non-profit agribusiness development firm in the area has been identified for a three-year pilot phase. A phased approach to be adopted with 15 ATCs established in year 1, 20 in year 2 and 17 in year 3.

**Investment costs:** Although no new storage facilities will be built, investment will be needed to refurbish existing warehouses and for equipment and machinery to operate the centre. Working capital will be needed and extra staff to support the network, as well as a budget for capacity building for farmers, cooperatives and agro-dealers. A total investment of USD 1,089,401 would be needed for a system of 52 ATCs. Funding may be a combination of loans and grants, with in-kind contributions from ATC operators.

**Risks:** The harvest season for maize and soybean takes a maximum of six months. ATCs will need to find other income-generating activities outside this season. There are pest and disease risks, e.g., from fall armyworm currently present in Zambia, whilst social and political factors are major risks. If the government makes changes to current policies on FRA or the input supply program, this will affect both farmers and agro-dealers in the ATCs.

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**CÔTE D’IVOIRE: HORTICULTURE ATC FEASIBILITY ANALYSIS**

**Market potential:** Côte d’Ivoire is a net importer of vegetables and covers only 60 percent to 70 percent of its needs. Import substitution represents a market opportunity of about 200,000 MT; canned tomato accounts for 75 percent of imported processed food. Market analysis shows growing urban demand for semi-processed vegetables and processed tomato products.

**Production Capacity:** Vegetable production is highly seasonal and dependent on rainfall in most areas. Farmers grow their vegetables at the same time which results in gluts in supply and low prices. Most production is from smallholders using traditional practices and manual labour, with a high proportion of women growers (70–80 percent). Constraints include low yields, poor agronomic management, limited access to inputs, and pest and disease outbreaks. Crops produced include bell peppers, tomatoes, okra, chillies and African eggplant.

**Government policies:** The government supports the Agropole Belier project (Projet de pôle agro-industriel dans la Région du Bélier – 2PAIB) funded by the AfDB. There is potential to link ATCs to the 2PAIB agro-park initiative in the future.

**Private sector:** Intermediary vegetable traders operate in the region. Farmers depend on them owing to the high perishability of products and absence of processing facilities in the region. Processing capacities are very low at national level. Industrial companies are looking to invest in expanding local processing capacities, especially for production of tomato sauce.

**Collective action:** A multi-stakeholder platform for horticulture in the Belier region was recently formed with the support of a donor but is still in the process of engaging value-chain actors. The platform already buys inputs in bulk and sells to members at a cheaper price; it is hoped that it will eventually operate as a trading platform, but for now buyers are reluctant to commit.

**Main constraints to value chain development:** The chain faces some upstream (production) and midstream (post-harvest handling and primary processing) issues. Output is low owing to traditional practices and dependence on rainfall. Poor post-harvest handling facilities for vegetables (lack of cool storage) mean that producers are unable to supply high-value markets such as supermarkets, and poor-quality packaging results in significant damage. Post-harvest losses are estimated at 30 percent. ATCs could help producers reduce post-harvest losses through better handling, conditioning and transportation. Only after post-harvest losses are reduced will it be worth investing in upgrading production.
Scope: The Horticulture ATC involves six physical centres in the vegetable growing areas. The model focuses initially on improving post-harvest handling of fresh produce (tomatoes), as well as creating an outlet for processing inferior-quality tomatoes. The ATCs would have a combined processing capacity of around 600 tonnes per year, with one ATC envisaged for a maximum of 45 ha based on an average yield of 13 tonnes per ha.

Services: Producers will deliver output to the centre to be cleaned, packaged, stored and finally loaded into a refrigerated truck for delivery to markets. A small processing facility at the ATC will make use of low-grade fruits to producing tomato puree for the local market.

Ownership and Management: The ATCs will be managed by the multi-stakeholder platform already established. At field level, each ATC will be commercially managed to reach financial sustainability, generating its own resources to maintain services in the long run. A local team of one manager and one worker will be appointed to manage the facilities at each ATC.

Investment costs: Total investment cost for an initial six ATCs is estimated at USD 594,430; this includes funding to strengthen capacity at the platform level. Costs associated with training sessions (quality, organization of farmers and production planning, selection of new varieties) and the input fund will be financed through a revolving credit fund, while infrastructure will be funded through a combination of grants and loans.

Risk: The ATC model relies heavily on the effective functioning of the recently established horticulture platform in Belier to coordinate the ATCs and link them with buyers. Financially, the model expects revenues to exceed costs from the third year onward, after losses in year 1 and year 2. However, this is based on a low minimum service fee which could be increased, depending on the willingness-to-pay of farmers using the facilities.

KEY MESSAGE 3

ATCs sit at the nexus between farmers and midstream buyers.

To be sustainable, the models proposed capitalize on existing infrastructure and draw on the skills of the private sector to provide a mix of upstream and midstream services to farmers, increase on-farm productivity, improve quality and decrease post-harvest losses. In so doing, they prepare farmers and their products to be integrated into the IAIP or linked to other commercial buyers.
Snapshot of critical strategies promoted for IAIPs, ACPZs and ATCs: lessons from Côte d’Ivoire, Ethiopia and Zambia

**KEY MESSAGE 4: INCLUSIVITY**

Strengthening domestic private sector and SMEs is critical to developing IAIPs.

Agro-industrial development must focus on strengthening the domestic private sector, in particular the role of SMEs in the upstream (input provision) and midstream segments of the chain (e.g. collection, aggregation, primary processing). This recognizes the critical role these enterprises play in the value chain in sub-Saharan Africa, where the midstream of the value chain is estimated to account for about 40 percent of the total gross value of food value chains and 80 percent of the actors operating in this segment are SMEs (AGRA, 2019). Specific activities have been identified along the commodity chains where women and youth can be gainfully employed or earn a profit as entrepreneurs.

In Ethiopia, youth SMEs will be formed and helped to access finance so that they can take on various roles, including providing mechanization services and transport. Community seed production programmes and grain cleaning are examples of women-led enterprises included in the IPs.

In Zambia, the ATC model proposed for maize and soybean includes lines of credit for youth entrepreneurs to purchase two-wheel tractors to provide mechanization and tillage services for surrounding farmers in partnership with the ATC. In the ATC model proposed in Côte d’Ivoire, tomato processing activities are considered highly suitable for women’s groups as 70 percent to 80 percent of horticultural production in the region is undertaken by women and processing would provide an opportunity to add value and increase income for these women. However, further gender analysis is required to ensure that this model is sufficiently aligned with their needs and interests.

As well as supporting SMEs, the IPs also aim to build on existing institutions that support small-scale farmers (cooperatives and unions), and funding for capacity building to strengthening their voice in the implementation of the IAIP is included.
When governments explore the IAIP option they often do so on a flawed assumption that multiple private sector actors are eager to operate from the parks, creating a market for ample produce to be supplied by local farmers. However, it is not that simple. Raw material production and supply development is gradual. Supply chain organization in each ACPZ needs to be improved so that aggregation and quality control occurs closer to farm gate. This happens at the ATCs/PCCs but takes time. Companies in the park may not be able to operate at full capacity until the supply chain is improved. At the same time, when demand is not stable, farmers may lack incentives to engage in ACPZ and ATC development.

Such a case exists in the Bure IAIP in Ethiopia: a starch processing company is fully established in the park and is increasing output each year, yet to date insufficient maize has been available in Ethiopia and imported maize was required. Thus, processors must have a long-term vision for engaging with IAIPs, as well as access to long-term capital and be willing to support the development of local producers until they reach a point where supply can match demand. It may also be advisable for government to provide additional support and incentives to compensate for this delay (e.g. tax holidays, partial funding of private extension services provided by the company to help prepare farmers, support to develop contract farming agreements etc.). In Yirgalem, Ethiopia, an example of this approach was identified in the avocado value chain, where a private firm operating outside the park is already supporting farmers to achieve the quantity and quality required for export.

**KEY MESSAGE 5: FOOD SECURITY**

Sustainability of IAIPs goes beyond commercial indicators.

Increased demand and formalized marketing channels (e.g. contract farming) incentivize farmers to focus production on single commodities that may not be suitable for household consumption. This could enhance dependence on the market to buy foodstuffs and increase the risk of food insecurity for households if production were to fail. To minimize these risks, the IPs should:

- Promote multiple value chains, balancing the needs for commercial viability and food security and nutrition concerns;
- Promote strategies that do not increase the market-dependence of households even as they become value chain suppliers, e.g. promotion of kitchen gardens, no mass-conversion of land, ensuring that contract farming agreements leave farmers with a portion of land for household use;
- Carefully select private sector partners to locate within the parks; processing enterprises should submit proposals before being accepted as investors, documenting how they will supply local markets, process waste and by-products, ensure nutritional content of the products, provide fair prices to the farmers etc.

**KEY MESSAGE 6: BALANCING DEMAND AND SUPPLY**

Demand-driven supply of raw materials takes time, and processors must accept delays in operating at full capacity.

When selecting commodity chains, food security risks must be considered in the design of the IPs, with appropriate strategies to minimize this risk. Primary chains must be selected based on commercial viability to guarantee the long-term sustainability of the park, but secondary chains must be developed in tandem that address food security objectives and ensure diversity of diet.

It takes time of ACPZs to develop, and for ATCs or PCCs and RTCs to grow and become established. Processors must accept that it may not be possible to operate at full capacity during this period. Government support may be required to incentivize companies to remain in the park and work with farmers in the ACPZs to achieve demand-driven supply. A phased approach to operations is recommended to allow for gradual development of additional output from ACPZs.
Process is sometimes as important as outcome – and this should be the mentality behind investment planning. While specific expertise in investment planning and stakeholder coordination are critical, capacity building at all implementation levels is a desired outcome. The lead team engaged in the IP development should:

• Engage government and its central and decentralized agencies, across sectors;
• Hold regional workshops with all stakeholders represented (including private sector and farmer representatives) throughout the process, from initial assessments to validation of findings and value chain selection;

KEY MESSAGE 7: ENVIRONMENTAL IMPACT

IPs must consider potential impacts on the environment from ACPZ development.

Concentrating agricultural production and promoting agro-industrial development creates implicit risks of environmental harms such as increased pollution, poor wastewater management and large-scale conversion of land to monoculture. Environmentally harmful practices for agricultural intensification and productivity increases cannot be promoted inside or outside the park by the operators located there. IPs for ACPZ development must analyse the desired interventions for their potential impact on the environment. Mechanization must be sustainable, promoting conservation agriculture including minimum tillage principles. Livestock production systems must promote fewer but more productive animals, etc. The carbon footprint from land conversion and the climate footprint of the promoted value chains can be analysed using FAO tools such as the Ex-Ante Carbon balance Tool (EX-ACT) and the Global Livestock Environmental Assessment Model (GLEAM-i). Steps to mitigate climate change – e.g. liming acidic soils, intercropping with pigeon peas, afforestation – must be included outside the commercial parameters of value chain development.

KEY MESSAGE 8: BUILDING CAPACITY

Capacity-building of key actors is essential in the development of IPs.

Investment plans must adequately identify and cost strategies to mitigate these risks and minimize harm – or decide against development if the risks are too high and cannot be effectively managed. Analytical tools, for example for carbon accounting of land use changes or environmental and social assessments, can be used.

Systematically developing, implementing and monitoring investment plans, through participatory stakeholder processes, as an integral part of IAIP development is new to many countries.

• Create national ownership of ACPZ and IP development. As it is critical that national experts are engaged in the process; international expertise may be needed where limited experience in investment planning exists, but it is critical to ensure that the capacity of national stakeholders is built – to validate the methodology and conduct data collection in the field, to engage directly with stakeholders and to present results to regional and national validation workshops etc.
• Ensure that capacity building is an ongoing component of IAIP development – annual action plans need to be developed and their implementation will need to be monitored carefully; all of this will require coaching and training of national staff.
KEY MESSAGE 9: IMPLEMENTATION AND COORDINATION

Coordination and monitoring of ACPZ development is critical.

A public entity with a mandate to steer project implementation across an array of partners must be identified and charged with carrying out that task. This mandate must be validated and accepted across the project’s implementing partners, including the private sector, development partners and farmers’ institutions.

IAIPs can be either public or private initiatives. While large companies can take some control of the supply-side arrangements around them, a degree of public financing is needed for public goods such as roads, electricity, and conducive business and contractual environments. The models described in this brief are all examples of agro-industrialization strategies initiated by the public sector with the hope of attracting private investment. Extensive public investment in park infrastructure is needed to bring private companies on board and stimulate them to invest in value chain development for lead commodities. In the early stages of park development, when adequate private sector investment is hard to obtain, government often relies on various development partners for these investments.

In addition, ACPZ development is multisectoral and often involves various ministries, coordination amongst which is a challenge in most economies, developed or developing. Implementation oversight and coordination are thus critical functions and a strong body must be put in place for this. Key elements to monitor include ensuring that partners follow the proposed intervention strategies, that funding is balanced and channelled evenly towards the outputs, and that partners work together in the field. Terms of reference, clear monitoring protocols and key indicators must be identified as part of investment planning, and relevant ministerial agencies must be capacitated at both federal and decentralized levels.
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References


Abbreviations

2PAIB Projet de pôle agro-industriel dans la Région du Bélier
ACC Agricultural Commercialization Cluster
ACPZ Agro-Commodity Procurement Zone
AfDB African Development Bank
AgPER Agricultural Public Expenditure Review
AGRA Alliance for a Green Revolution in Africa
ATC Agricultural Transformation Centre
BDS Business Development Services
Ex-ACT Ex-Ante Carbon balance Tool
FAO Food and Agriculture Organization of the United Nations
FRA Food Reserve Agency
FTC Farmer Training Centre

GLEAM-i Global Livestock Environmental Assessment
GPS Global Positioning system
IAIP Integrated Agro-Industrial Park
IP Investment Plan
NGO non-governmental organization
PCC Primary Collection Centre
RTC Rural Transformation Centre
SCPZ Staple Crop Processing Zone
SME Small and Medium Enterprise
UNIDO United Nations Industrial Development Organization
This investment brief features some of the models being applied to meet the challenges of increasing production and organizing stronger supply chains to bring raw materials to agro-industrial parks in sub-Saharan Africa. It presents nine key messages, drawn from concrete experiences in Ethiopia, Côte d’Ivoire and Zambia. It seeks to provide guidance to governments and partners on how to embark on an agro-industrialization process. A sound investment planning process is needed to identify the capital requirements for expanding production in the areas around the parks; capacity development is required to upgrade the skills of farmers and traders, aggregation through farmer institutions and private sector development; and for monitoring and coordinating investment plan implementation. Investment plans for agro-processing zones allow governments to demonstrate to potential investors both their existing production and aggregation capacities and the critical areas where additional private sector skills and investment are needed.

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