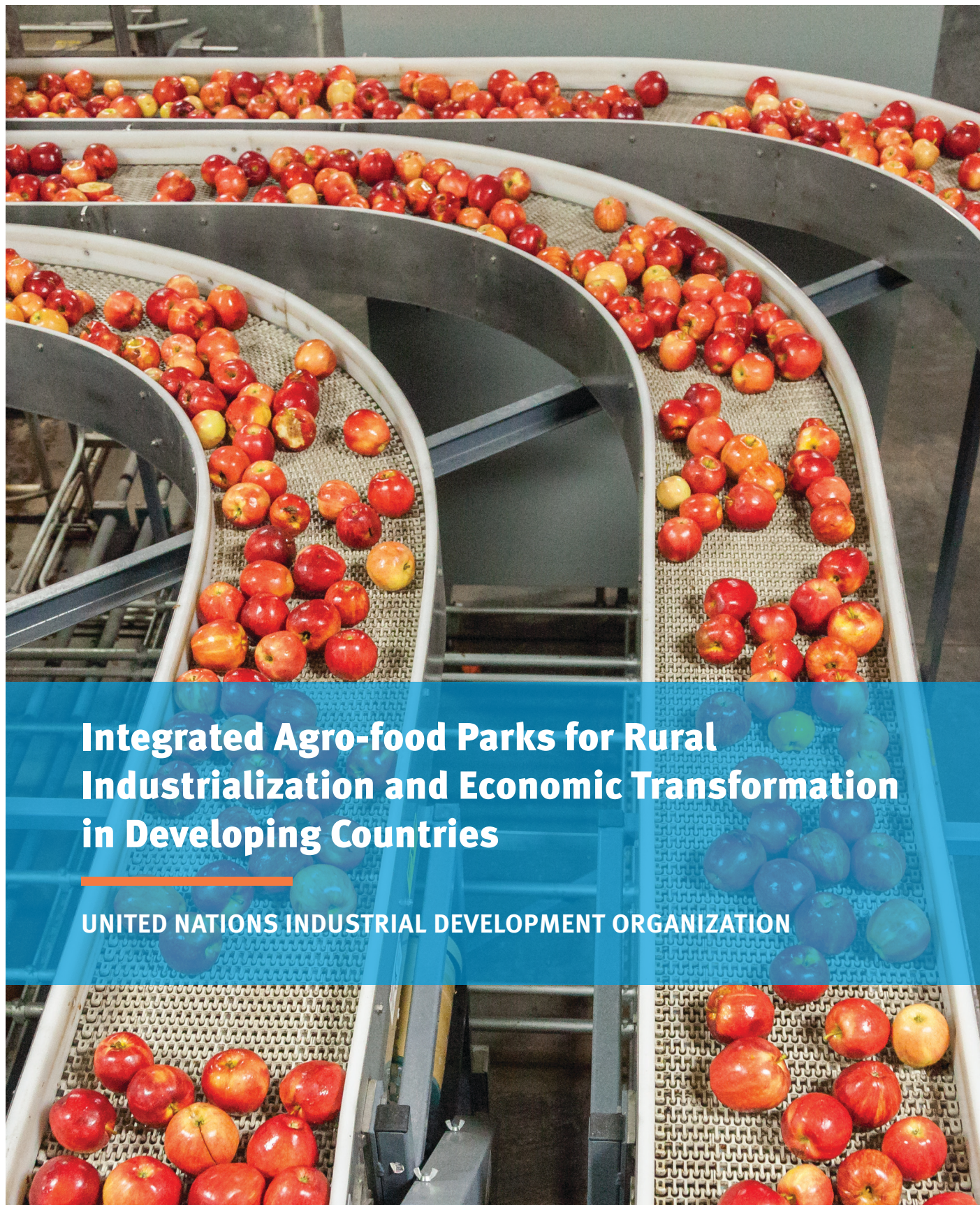




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Integrated Agro-food Parks for Rural Industrialization and Economic Transformation in Developing Countries

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1

Introduction

Global agricultural supply chains are changing rapidly, yet developing countries still lag behind in terms of agricultural output and other key productivity measures. Achieving the Sustainable Development Goals, including Goal 1 on no poverty, Goal 2 on zero hunger, Goal 8 on decent work and economic growth and Goal 9 on industry, innovation and infrastructure, will require the transformation of the agribusiness sector in developing countries, to deal with problems of inadequate infrastructure, poor connectivity and integration of farmers with supply chains, and to respond to changing consumer demand created by an increasing global population and a shift in consumption behaviour. Integrated agro-food parks (IAFPs) are proving a

successful model to develop a robust agribusiness sector and tackle the sustainable economic transformation challenges facing many developing countries today. The primary objective of IAFPs is to create investment opportunities in agribusiness. This is facilitated through increased scale and lower costs, stronger supply chain linkages and higher quality produce, by clustering firms through the provision of infrastructure and agribusiness-related services. IAFPs have the potential to have a transformative impact by promoting innovation, contributing to climate-smart agricultural production, processing and marketing, while further integrating rural producers in regional and global supply chains, thus supporting rural development.





Introduction



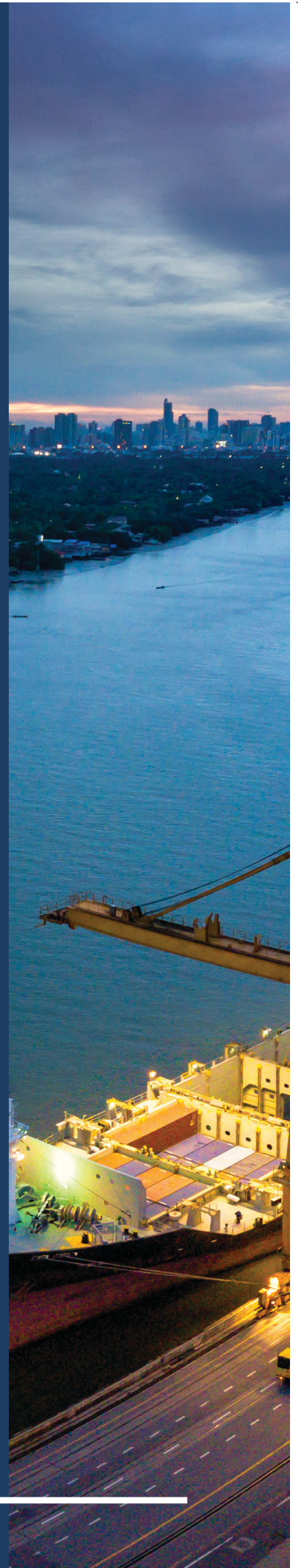
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A dynamic global agribusiness context

Agribusinesses must adapt to a rapidly shifting context for the demand and supply of food, and also to the nature of agricultural production. There is an urgent, overarching need to tackle climate change – which is linked to agricultural production in complex ways, both through the contribution of the sector, and the significant threats that it poses to the sector – with a need to ensure the alignment of agriculture with environmental sustainability goals. At the same time, agricultural practices are increasingly geared towards more efficient regional and global agricultural value chains, with greater opportunities for trade and investment. New technologies, including agriculture-focused information and communications technology and the digitization of the supply chain, are transforming food systems and offering

new opportunities to improve policy. With a growing population and limited natural resources, agribusinesses are racing to increase productivity, with mounting attention given to innovation to help find a way to sustainably feed a growing population.

The global population is growing rapidly and expected to reach 8.5 billion by the end of this decade. A lack of opportunity in rural areas is leading to ever-increasing numbers of young people migrating to cities and across borders in search of a better life. The sustained high level of rural to urban migration means that by 2030 the proportion of urban dwellers is expected to reach 60 per cent. Alongside economic growth, such demographic shifts bring significant changes in consumption patterns, at a time when food prices are rapidly increasing.





A dynamic global agribusiness context



3

Challenges of agro-industrialization and rural transformation

In many developing countries, in particular in sub-Saharan Africa, a robust agro-industrial sector with the potential to lift millions from poverty and increase global food supply chains has not emerged. Leading

challenges to the emergence of a strong agro-industrial sector in developing countries are described below in this chapter.



UNDERDEVELOPED AGRICULTURAL VALUE CHAINS

Underdeveloped agricultural value chains limit agricultural efficiency and growth even where competitive advantages exist. Large numbers of smallholder farmers scattered over vast areas together with supply-driven agricultural practices lead to collection inefficiencies, a proliferation of traders, high post-harvest losses and higher prices. Farmers produce inconsistent quantities and qualities and this affects their efficiency and ability to compete in regional and international markets. Limited means of communication leave farmers with little knowledge of buyer expectations and insufficient incentive to produce high-quality products. As a consequence, agroprocessors are unable to procure locally the appropriate quantity and quality of raw materials. Lack of scale creates high overhead and transaction costs, and agricultural and agribusiness services, such as eco-friendly waste recycling and disposal, cannot be efficiently provided to widely dispersed firms lacking a critical mass.







FRAGMENTATION OF LANDHOLDINGS

Fragmentation of landholdings occurs as a result of a growing rural population that has limited opportunities for off-farm employment. Fragmentation decreases per capita income and leads to disguised unemployment in the agriculture and agribusiness sectors in rural areas of developing countries. Fragmentation and low per capita productivity lead to high aggregation costs of surplus production to meet the scale required by industries.



LACK OF SPECIALIZED AGRIBUSINESS INFRASTRUCTURE

Many developing countries lack specialized agribusiness infrastructure, including cold storage units, quarantine facilities, quality control laboratories, quality certification centres, raw material storage, and controlled and modified atmospheric storage. Environment-related infrastructure such as sewage and effluent treatment plants are not available for small and medium-sized enterprises. The absence of shared infrastructure, combined with limited utilities and business development services, increases initial investment costs and keeps the barrier to entry high. For those businesses that do get off the ground, the context entails higher operational costs and higher unit prices, leaving them less competitive at the regional and global levels and less able to expand.



SLOW AGRICULTURAL TECHNOLOGY ADOPTION AND MECHANIZATION UPTAKE

Agricultural technology adoption and mechanization uptake is slow as a result of four main factors: availability is often limited in developing countries; access to hard currency or lines of credit to purchase quality inputs and technologies is difficult; distribution mechanisms are often poorly developed or absent; and utilization is low as the knowledge and skills to make the best use of inputs and technologies is often absent or underdeveloped. Public extension services that could play a role in the supply of quality agricultural inputs and services are often ineffective or have limited capacity. Strategies for the intensification of food production often require agricultural inputs of the right quality and quantity. This emphasizes the role of extension services and farmers' cooperatives in the supply and uptake of appropriate inputs and technologies.



ANNUAL POST-HARVEST LOSSES

Annual post-harvest losses account for approximately 30 per cent of food produced for human consumption; fruit and vegetable losses are estimated at 50 per cent or more. Losses occur at every stage of the value chain and have significant economic and environmental impacts. Poor quality inputs and limited use of agronomical best practices increase losses at the farm level, while further losses occur through inefficient processing technologies and practices, insufficient packaging, poor storage and inadequate logistics.



SKILLS SHORTAGES

Skills shortages in many developing countries affect the ability to make use of new agricultural technologies and services. The agricultural sector continues to employ a significant proportion of the workforce, but most knowledge is gained through the intergenerational transfer of skills. The vast majority of workers in the agricultural sector are without adequate vocational training and education to support the adoption of new technologies and services or to shift seamlessly to employment in the agro-industrial sector. Formal agricultural technical and vocational education and training (ATVET) has only recently begun to emerge in many developing countries. This means that there is a shortage of qualified trainers, curricula, and infrastructure for practical agricultural learning. The majority of ATVET institutions lack access to the latest knowledge and technology, while instructors and extension workers lack technical skills, knowledge and pedagogy to effectively deliver training courses to farmers. Much of the global research and development into improved agricultural technology and practices does not reach poor rural farmers in developing countries. Moreover, agriculture is seen by many, especially youth, as a livelihood option of last resort, making it difficult to recruit young people for ATVET programmes.¹

1) Trent Brown and Shyamal Majumdar, "Agricultural TVET in developing economies: challenges and possibilities", UNEVOC Network discussion paper, 2020. Available at https://unevoc.unesco.org/pub/discussion_paper_agricultural_tviet.pdf.



LIMITED FINANCIAL RESOURCES

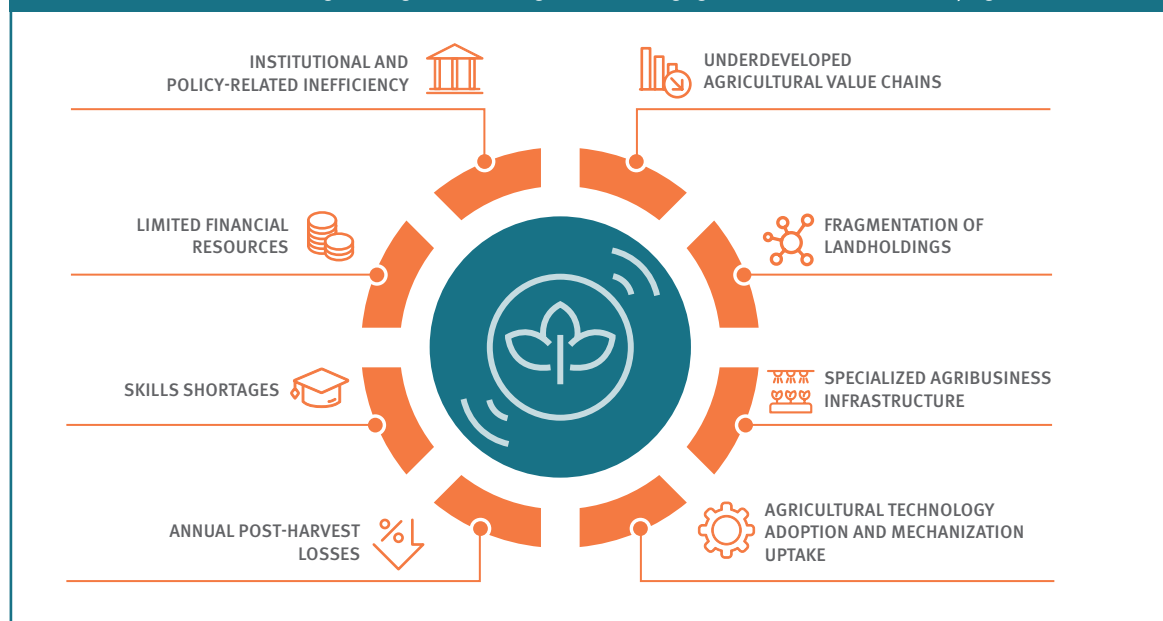
Limited financial resources mean that smallholders, especially women and youth, are unable to expand agricultural activities (through the purchase of equipment and inputs, infrastructure maintenance, transport of products to markets, and others). Farmers' access to rural financial services is constrained by socio-cultural, economic, legal and educational barriers. The presence of formal financial institutions (such as banks or microfinance institutions) is limited in rural areas, and existing financial services intended for rural communities rarely benefit farmers, partly because of collateral requirements. The lack of financial institutions leaves farmers and agribusinesses unable to access savings, insurance and credit products. Moreover, many of the rural poor wanting to borrow from a bank or microfinance organization lack the experience and skills necessary to process loans, while the social stigma attached to loans also constrains access to financial resources. On the supply side, the presence of system-wide risk characterizing agricultural activities, lack of general understanding of the sector and limited financial infrastructure (for such purposes as tracking the identity of clients or monitoring outcomes) constrains the provision of financial services in rural areas.²



INSTITUTIONAL AND POLICY-RELATED INEFFICIENCY

Institutional and policy-related inefficiency has a direct impact on the emergence of a strong agribusiness sector. Agribusiness or even park-specific policies, including regulations and implementation road maps, provide frameworks for the development of the sector. Such documents are often not available. Institutions are often under-equipped to develop policy and oversee its implementation, and face a wide range of barriers, including gaps in financial and human resources, difficulty coordinating across implementing agencies, and interference from interest groups.

FIGURE 1: Relevant leading challenges to the emergence of a strong agro-industrial sector in developing countries



Source: UNIDO

2) Claudia Ruiz, "How can finance influence productivity of agricultural firms?", World Bank blog, 13 January 2014. Available at <https://blogs.worldbank.org/allaboutfinance/how-can-finance-influence-productivity-agricultural-firms>

4

Integrated agro-food parks: concepts, objectives and benefits

4.1 DEFINING THE IAFP MODEL

The integrated agro-food park, a form of industrial park, is increasingly viewed around the world today as a tool to support the growth of a robust agro-industrial sector. The United Nations Industrial Development Organization (UNIDO) defines IAFPs as “an agribusiness development corridor integrating value chain actors with high-quality infrastructure, utilities, logistics and specialized facilities and services to create economies of scale for

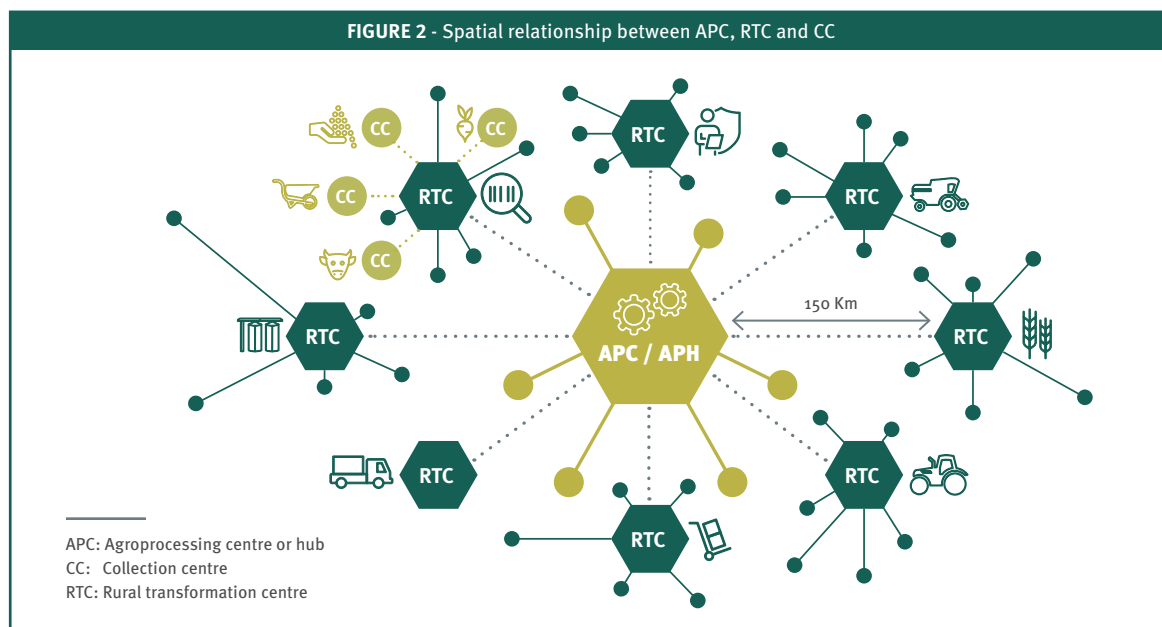
sustainable market-driven agribusiness development and rural transformation. IAFPs also seek to generate spillover and multiplier effects in surrounding rural populations” (UNIDO, 2019). IAFPs typically comprise three distinct yet integrated components, as set out below. The concept of IAFP is sometimes used interchangeably with APH, however the IAFP model comprises three integrated components.





Integrated agro-food parks: concepts, objectives and benefits





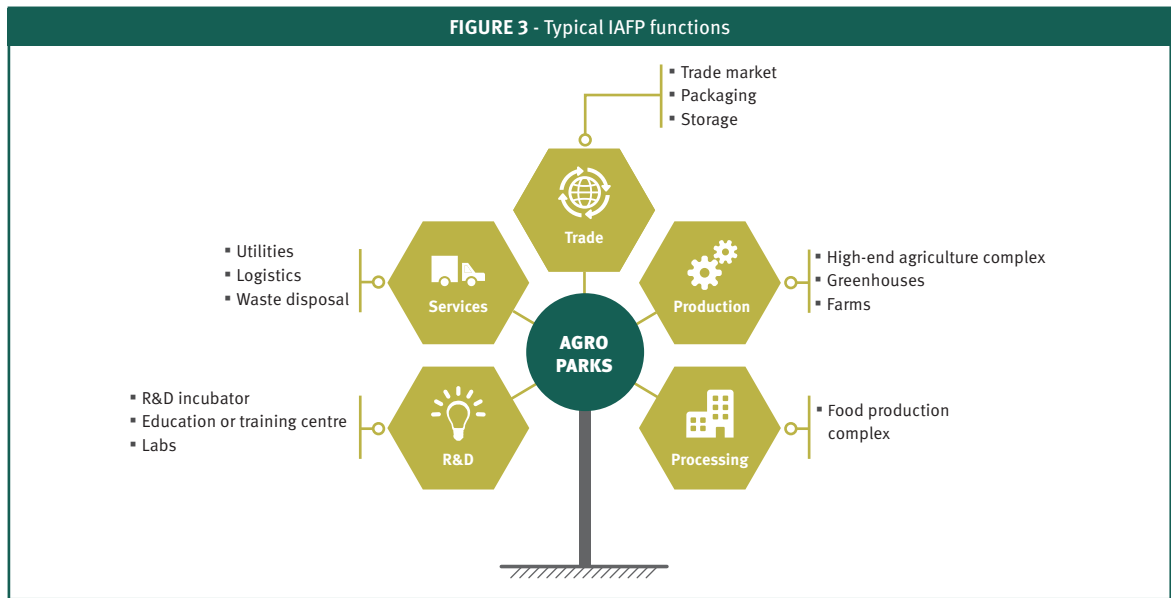
Agroprocessing hubs



Agroprocessing hubs (APHs) are the first of such components. At the heart of the IAFP, APHs are centrally managed clusters of agro-industrial and allied firms grouped to gain economies of scale and positive externalities by sharing utilities, common and specialized infrastructure, and taking advantage of opportunities for bulk purchasing and selling, and also business services.

Multiple functions take place in APHs, such as final processing, storage, packaging, marketing and distribution.³ The APHs house purpose-built shared facilities to enable processors and distributors to operate in the same location, thus reducing transaction costs and sharing services for increased productivity and competitiveness. APHs are supported by adequate infrastructure, logistics and specialized facilities and services required for agro-industrial activities (including electricity, water, cold chain facilities, laboratory and certification services, business services, ICT and waste treatment, among others).

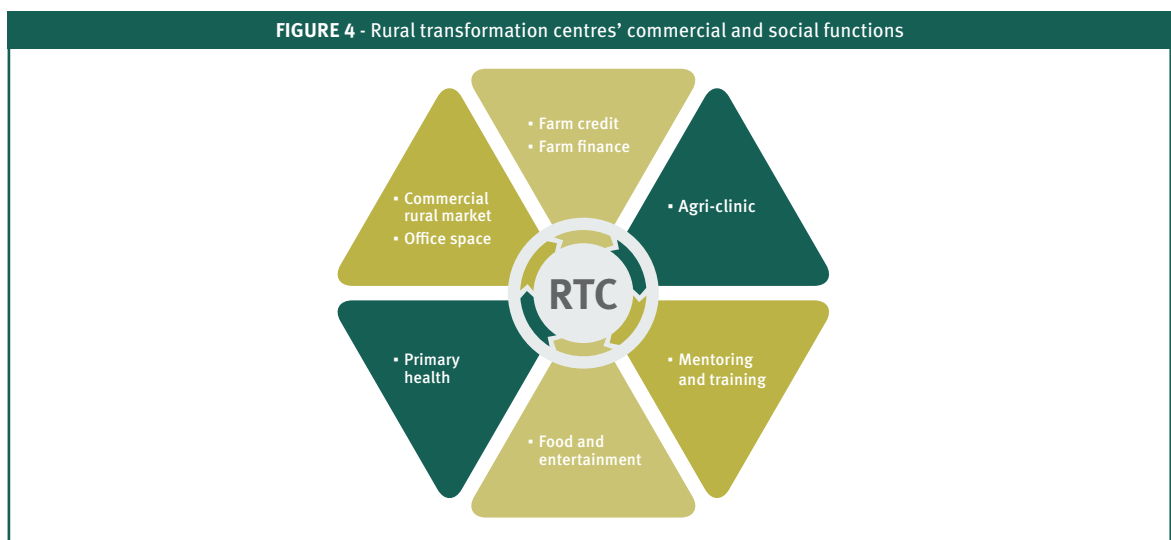
3) Agroprocessing activities may be demarcated into three main categories based on the level of technology used: primary agroprocessing (such as washing, cleaning, grading and labelling); secondary agroprocessing (such as milling grain, grinding groundnuts, pressing oil and pressing juice); and advanced agroprocessing (such as product transformation, baking and extractive activities).



Rural transformation centre



The second component is the **rural transformation centre**. Each APH is served by a network of such centres, which link producers to the agro-industries at APHs. Each centre comprises a physical complex of facilities that serves as an aggregation point where agricultural produce from farming communities or collection centres is collected, sorted, stored and may undergo primary processing (according to product-specific need), before onward transport to the APH, or direct marketing to consumers (as may be the case for fresh fruits and vegetables).



Collection centres



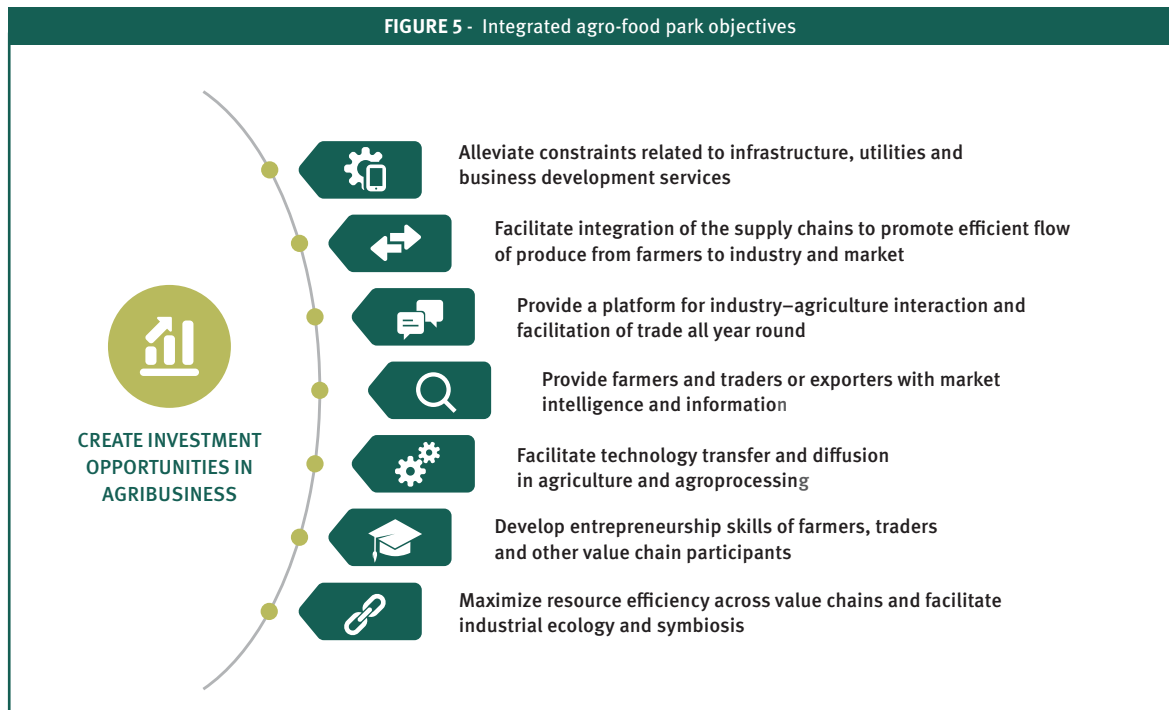
Collection centres, the third component, are located in villages close to the source of production, within feeder catchment zones, to ensure a steady supply of raw materials to regional transformation centres and APHs.

The three components together can cover thousands of hectares surrounding the APH, and also the wider catchment area, sometimes called an agro-crop procurement zone.

4.2 IAFP OBJECTIVES AND BENEFITS

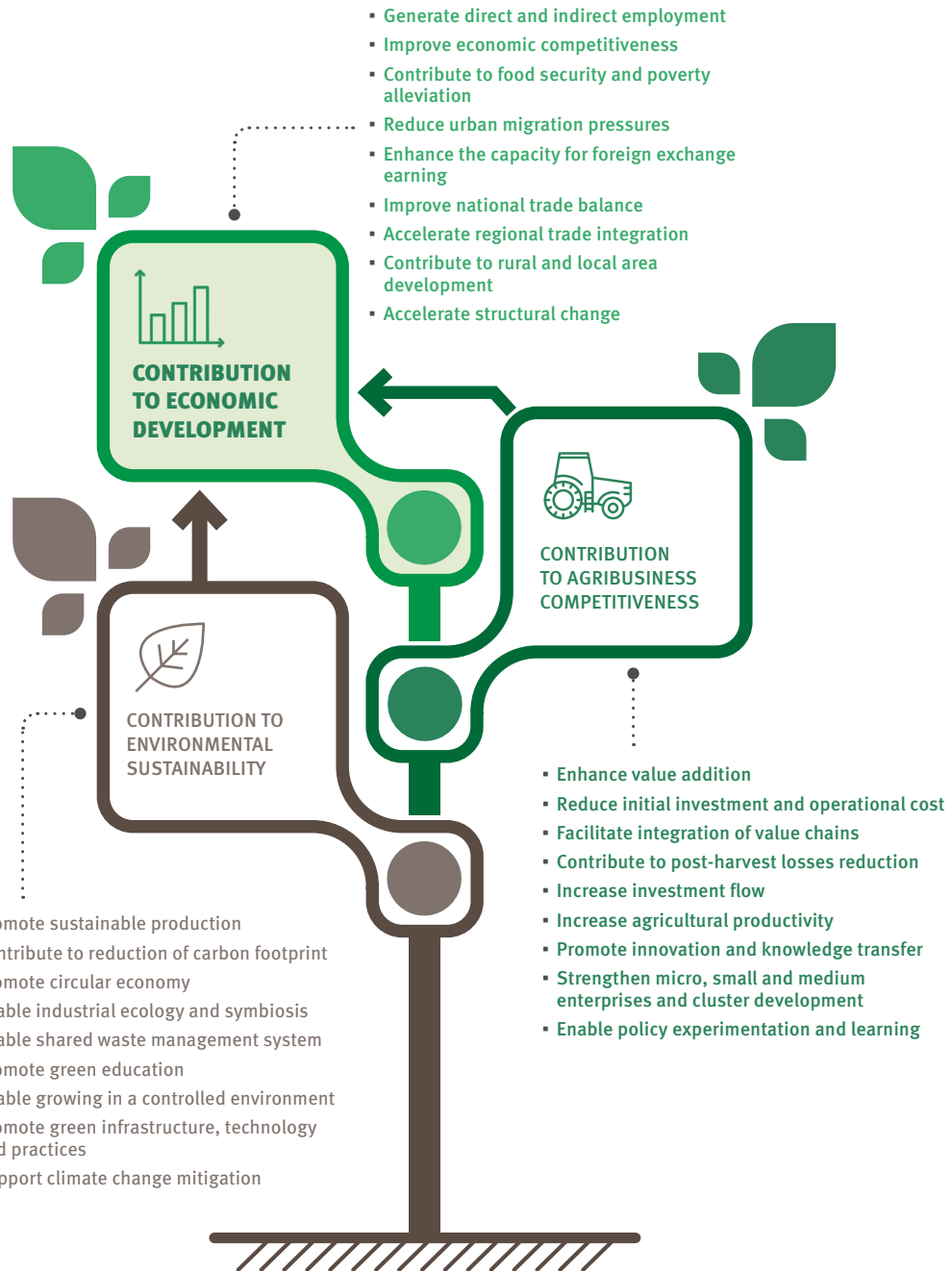
IAFPs have multiple objectives that combine business opportunities with economic development and poverty reduction needs to create win-win solutions for sustainable agro-industrial growth. The

primary objective of IAFPs is to create investment opportunities in agribusiness. Figure 2 outlines seven key objectives that make IAFPs a unique agro-industrial development model.



Source: Authors' own elaboration

FIGURE 6 - Summary of benefits of IAFPs



Source: UNIDO



BOX 1 - Honey manufacturing in Yirgalem IAFP



Getu Haile is a honey farmer from the town of Mejo in the Harororesa area of the Sidama region. In 2021, Mr Haile invested in the Yirgalem integrated agro-industrial park. He moved into a 1,500 square meter processing shed, where he set-up his processing machines. Today, the company, Haroresa Honey Processing PLC, is managed by his daughter, Kalkidan Getu. Ms. Kalkidan Getu, explained that the company had previously tried working in agricultural clusters, but the services available at the park are superior. The international exposure has also benefitted the business. The company employs 64 permanent staff and 12 temporary staff. It sources its honey from 67 apiculture associations around the region.

The manufacturing facility collects between 230,000 and 250,000 kg of honey on an annual basis, of which 85 per cent of which is processed pure natural honey and is sold domestically. Mr Getu notes that he expects revenues to be about 10 million ETB in 2022 (the equivalent of USD 185,500).

With a new line of credit in late 2022, Ms Kalkidan Getu explains that the company plans to purchase additional processing machines and double production to roughly 500,000 kg per annum. The production increase will not only create more employment in the factory, but will have a knock-on effect for the honey producers in the region.

5

UNIDO's technical assistance for the development of IAFPs





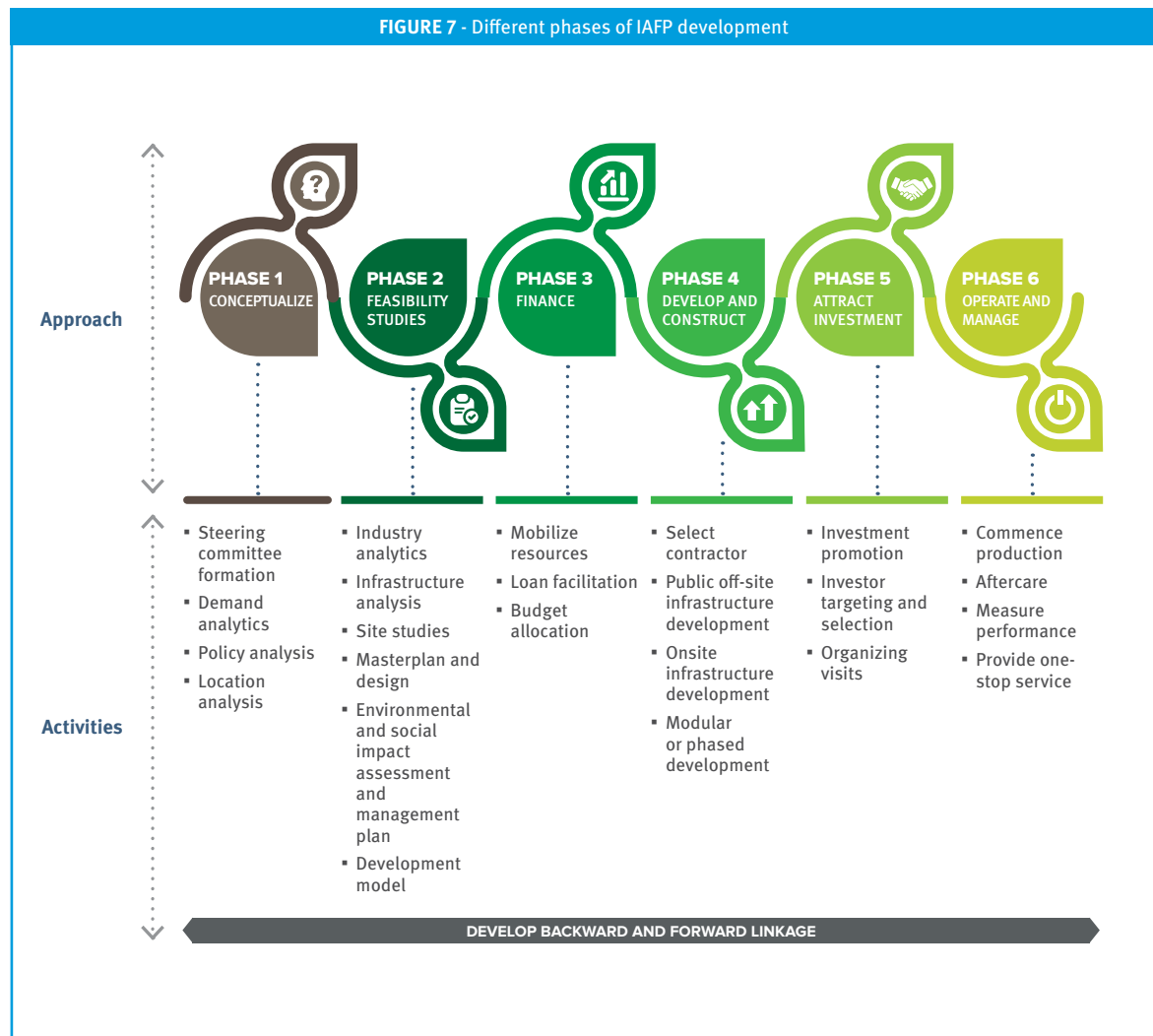
UNIDO's technical assistance for the development of AIFPs





UNIDO provides technical assistance and policy-focused research on IAFPs. The planning, design and construction of an IAFP is a long process due to the scope of the action itself, as well as the numerous stakeholders involved. Successful IAFP development requires a clear and step-by-step strategic framework ranging from project conceptualization to operation and management. These steps can be broken into six, each with numerous sub-steps and deliverables. UNIDO offers technical assistance at each phase of park development and operations.

The phases are not all necessarily sequential. For example, finance and investment attraction may commence at the outset of the project, as can establishing the institutional framework for such services as a one-stop-shop for investors.





BOX 2 - The inspiring journey of a dairy farmer: from few cows to a thriving business



Ayele Ayane is a 35-year old farmer from Sidama region Bensa daye Aletawondo woreda. He has six kids and works in dairy, coffee, and cattle farming. Although working across the three sectors, he found he could only just barely earn a good income for his family. When the Duoley Food Processing PLC moved into the Yirgalem integrated agro-industrial park, Ayele saw an opportunity to ensure that he was one of the suppliers of fresh milk to the factory.

Ayele previously sold 70 litres of milk in the local karat, but since starting to supply for Duoley Food Processing PLC, he has expanded his farm land, converted the chat farm to grazing land for the cows, raised the number of milk cows from four to eleven, prepared a suitable place for the cows, and his hard work is now paying off, boosted his daily milk production to 160 liters per day for the cooperatives.

Ayele also explains that he was pleasantly surprised earn an increase in the price per litres from 25 Birr/litres to 35 Birr/litre when he began selling to Douley PLC. Ayele continues by noting *“my income was about Birr 35,000, but now it is Birr 70,000. This allows me to enroll the kids in a private school, build a house in the city, and hire five local youths to help on my farm.”* With the newly established milk processing company, and some hard work on his part, Ayeles' dedication to his business have paid off, and his dairy farm has become a great success. He has now one of the most successful dairy farms in the region. Not only has he been able to provide for himself and his family, but he has also been able to create jobs in their local community and contribute to the local economy.



Incorporating sustainable agribusiness practices

IAFPs offers significant opportunities to increase operational efficiencies and environmental sustainability through common infrastructure and systems for water management, energy, waste recycling and resource recovery. An environmental and social impact assessment is a critical component of any IAFP feasibility plan. Focus on environmental planning not only identifies environmental guidelines in respect of national laws and international best practices, but also identifies intervention points to promote sustainable food processing systems throughout the catchment area.

Environmental sustainability is further enhanced through the application of an eco-industrial park approach. The approach employs renewable energy and pollution prevention principles and applies industrial symbiosis and other environmental management methods to reduce pollution and waste. The large concentration of producers, agribusinesses and institutions organized around IAFP, using natural resources, requires careful planning and operations respectful of natural systems. Sustainable solutions can be applied to different aspects of the IAFP, from basic infrastructure construction and operations, reserving land for green spaces, and waste utilization techniques. Agricultural extension services can also be augmented to support green industry and sustainable agribusiness.

The concentration of agricultural activities allows for a more self-contained system and a cycle-closing approach, in which the outputs of one process are the inputs of another. Examples of this approach include the use of heat from electrical generators for greenhouses, and of by-products of food processing for animal feed, organic fertilizer or essential oils. Such linkages and proximity also facilitate product traceability, which can be used to better measure the carbon footprint of a product from farm to fork.



CONCLUSION: IAFPs AS AN EMERGING TOOL FOR AGRO-INDUSTRIAL TRANSFORMATION

IAFPs offers a potentially transformative model for the development of the agribusiness sector, especially in developing countries. IAFPs create investment opportunities in agribusiness. They can contribute to the twin goals of agro-industrialization and rural

development. This policy brief summarizes the challenges facing the agricultural sector, and the concept of the IAFP approach, its objectives and benefits, and strategies for putting it into practice. In conclusion:

- 1 IAFPs respond to a pressing need for sustainable agro-industrialization and a more competitive agricultural sector in developing countries, made more urgent by the global context of growing populations, high rural-urban migration, new supply-chain-focused approaches, new technologies, and the threat of climate change.
- 2 IAFPs expedite improvements in efficiency, greater synergy in agricultural production between IAFP-based firms, increased access to finance and agro-related services, and the rapid integration of rural areas into robust agricultural supply chains with strong forward and backward linkages. This in turn creates employment and income and enhances the quality of life in rural areas that will be essential for achieving the Sustainable Development Goals.
- 3 Partners from the public and private sectors should endeavour to design cost-effective solutions to meet the hard and soft infrastructure needs of agribusiness and related firms; create strong supply chain linkages to a surrounding rural catchment area; encourage innovative partnerships and platforms for sharing knowledge, skills, technology and information; and support broader rural development initiatives.

As interest in the IAFP approach grows, UNIDO and its partners are providing technical assistance and policy-focused research on IAFPs. The forthcoming publication 'Guidelines for Sustainable Design, Development and Management of Integrated Agro-Food Parks (IAFPs)' will

provide more details on the introduction provided by the policy brief, including further details on step-by-step guidance for IAFP development.



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