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For a Sustainable Agro-Industry

Integrated Agro-Industrial Parks in Egypt

Piloting the concept in Qalyoubia Governorate

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WEIGHTS & MEASURES

1000 kg	=	1 metric ton (t)
1 kilometer (km)	=	0.62 miles (mi)
1 meter (m)	=	1.09 yards (yd)
1 square metre (m2)	=	10.76 square feet (ft2)
1 acre (ac)	=	0.405 hectares
1 hectare (ha)	=	2.47 acres
1 feddan (fd)	=	0.42 hectares
1 hectare (ha)	=	2.38 feddan

Abbreviations and Acronyms

CAPMAS	Central Agency for Public Mobilization and Statistics
CSP	Concentrating Solar Power
EU	European Union
F&V	Fruit and Vegetable
FAO	Food and Agriculture Organization of the United Nations
FDI	Foreign Direct Investments
GTI	The Green Trade Initiative
HPLC	High Pressure Liquid Chromatography
R&D	Research and Development
RTD	Research and Technological Development
SME	Small and Medium-sized Enterprise
STE	Solar Thermal Electricity
SWOT	Strengths, Weaknesses, Opportunities and Threats
UNIDO	United Nations Industrial Development Organization
GDP	Gross Domestic Product

Definitions

Agro-Industrial Park:
Shared facilities and services in the form of a community built for the processing of agricultural products.
Eco Park:
An industrial park in which businesses cooperate and interact with the local community to share resources and reduce waste.
Clusters:
Geographical concentrations of inter connected enterprises and associated institutions that face common challenges and opportunities.

1. OVERVIEW: AGRICULTURE & FOOD PROCESSING IN EGYPT

The development of the Agriculture and Agri-business sectors in Egypt hinges on addressing the constraints present in the value-chain. Despite contributing by 11.3% in Egypt's GDP and 28% of all jobs (FY 2015/16), the agriculture sector, and hence agribusiness growth, are both hampered by institutional deficiencies. Smallholder farmers constitute around 80% of agricultural land ownership and production in Egypt[1]. The vast majority of these producers are not part of any organized networks or associations, and do not have access to formal value-chains. The food-processing sector in Egypt is also considered underdeveloped, highly fragmented, and dominated by the informal sector. For example, 79% of the dairy market in Egypt is artisanal, leaving a sizeable processing opportunity untapped[2]. Moreover, the food retail supply chain is highly fragmented among a large number of distributors, wholesalers and retailers. This kind of fragmentation results in poor economies of scale, thus leading to the manufacturing of products of sub-optimal quality, and packaging that negatively affects the trade balance and prices of final products[3].

Egypt has a trade deficit in agricultural products (fresh produce) of around USD 2 bn excluding grains (2015). In the year 2015, agricultural products exports amounted to USD 2.2 bn, and total imports of USD 6.3 bn. Egypt remains highly dependent on food imports and remains the world's largest importer of wheat, and is therefore highly vulnerable to fluctuations in global commodity prices. Agricultural imports are mainly focused on Fruits and Peanuts & Leguminous crops, which both accounted for a total of USD 926 million in 2015[4]. Egypt also faces a deficit in processed food products that reached around USD 4 bn in 2015, with exports reaching USD 2.6 bn versus USD 6.5 bn of imports.

Adding to the challenges mentioned above are the expected further price surges, in both imported and local fresh produce and food products, as a result of the recent economic reform measures, including the floatation of the Egyptian Pound, and the streamlining of fuel subsidies. This will in turn shape demand, directing consumption towards local rather than imported goods, putting more pressure on growers and manufacturers to meet the expected demand, in terms of both quantity and quality. Linking smallholder farmers to formal value-chains would significantly assist in achieving economies of scale, which would in turn reduce costs of production, provide higher-income generation activities, as well as the creation of job opportunities. Targeting the development of agro-industries by addressing the limitations in the value-chain (that ranges from the limited access to information, financing, and technologies) would accelerate economic development, and achieve Egypt's industrial development goals. Within that context, adopting Agro-Industrial Parks (AIPs) as a concept on a national scale presents itself as a promising contributor in achieving these goals.

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[1] Promoting Agricultural Value Chains In the OIC Member Countries. Standing Committee for Economic and Commercial Cooperation of the Organization of Islamic Cooperation (COMCEC), 2015.

[2] Egypt Economic Recovery Plan: Agriculture and Agribusiness Sector Analysis and Initiatives. Booz and Co, 2014.

[3] Egypt Economic Recovery Plan: Agriculture and Agribusiness Sector Analysis and Initiatives. Booz and Co, 2014.

[4] Sources: General Organization for Export and Import Control (GOEIC)

2. AGRO-INDUSTRIAL PARKS: THE TOOL NOT THE GOAL

2.1 The Developmental Role of Agro-Industrial Parks

Agro-Industrial Parks (AIPs) as defined in literature, are units which add value to agricultural products, both food and non-food, by processing them into products which are marketable, or usable, or edible, or by improving storability, or by providing the link from farm to market or part thereof. It is an integrated clustering model that combines different agro-production chains, thus maximizing operational synergies, economies of scale, and income generation activities for the community it is located in. By targeting the vertical and horizontal integration of value-chains, AIPs aim at achieving sustainable development goals in the area in which they are established.

The general objective of the agro-park is to support several distinct areas dedicated to processing, logistics platforms, R&D, training, and technology transfer, business incubators, service areas, and other common facilities. Basically, the Agro-park has to fit in a network containing three strategic functions:

- Rural Transformation Centre: combining collection and storage of farmers' products with rural development services;
- Agro Production and Processing: combining production, processing, collection, R&D, trade, and social functions;
- Consolidation Centre: serves a metropolitan market in a consumer responsive way throughout the year.

Box 1: Agro-Industrial Parks (AIPs)

More specifically, a park[1]:

- Is an industrial space with a central management system where agribusinesses and agro-industries (of all sizes) co-locate;
- Usually occupies between 10 and 160 hectares of urban or semi-urban land;
- Promotes value addition through processing and storage of food, feed and biofuels;
- Provides common facilities, services, utilities, and waste disposal;
- Can also provide a marketing channel, and/or export services including packaging;
- Can also place an emphasis on agro-ecology (agro-ecological park) or science and technology/R&D (science or technology park or technopole).

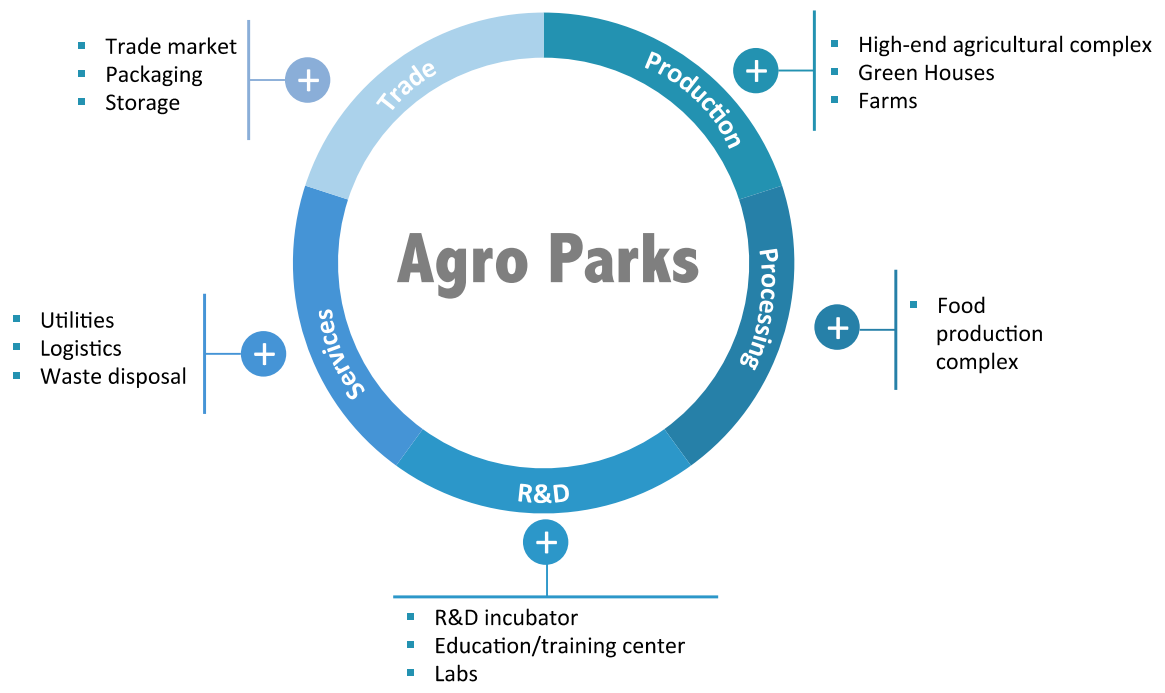
In the context of an overall development strategy, AIPs exist for common goals aiming at boosting the value-chain, retaining the local market, creating employment, and developing and protecting local SMEs. The common facilities and services, and value-chain linkages created, help enhancing the competitiveness of smallholder farmers and manufacturers in the community. They form centers of growth and innovation, supporting local development, and contributing to a more sustainable development model.

An agro-industrial park, indeed, is not a simple physical aggregation, but an agro-industrial strategy targeting economic development and employment generation. Economic development and employment growth in rural areas are mostly led by the growth of commercial agrifood systems, which are efficiently run and responsive to evolving market demands[5]. Agro-industries generate significant levels of direct and indirect

[5] Agro-industrial parks: Experience from India. FAO, 2006

employment per unit of investment, through the backward linkages to agricultural suppliers (especially smallholder farmers), and forward linkages to retailers and markets. Experiences from other countries show that one agro park (50-100 feddans) can create a range of 2,000 to 4,000 direct and indirect jobs, in addition to raising incomes of smallholder farmers. Poverty reduction will be achieved through the integration of smallholder farmers, and small-scale processing industries in the value-chains. In turn, this will increase local value-addition, create additional jobs in rural areas, and improve the overall efficiency of the agricultural value-chain. The efficiency of post-harvest handling, processing and marketing operations, is a major determinant of the prices paid by urban and rural poor, and is an important factor in ensuring household food security. Improvements in the performance of the agro-processing and distribution sectors also contribute to the safety and quality of food for all households. Agro-enterprise development has the potential to provide employment for the rural poor in off-farm activities such as handling, packaging, processing, transporting, and marketing of food and agricultural produce. Similarly, input suppliers have an important role to ensure that the farm sector has access to inputs and materials at competitive prices[6].

Figure 1 Agro-Parks: The Concept



2.2 Planning and Designing Agro-Industrial Parks

The use of AIPs as a tool for agricultural value addition and competitiveness is quite recent in both industrialized and emerging economies, and the last decade has seen continuous efforts in developing various versions of AIPs. The various formats for AIPs are developed according to planned industrial activity, space use, and more importantly their developmental objectives, as shown in the table below:

[6] Agro-industrial parks: Experience from India. FAO, 2006

Table 1: Types of AIPs[7]

Classification	Type	Feature
Industry targeting	• Specialized agropark • Mixed or hybrid industries park	• Focus on agro-industry • Several industries, including agrifood
Premises and services	• Intensive agro-industrial parks • Mixed-use parks • Integrated social agroparks	• Agro-industrial and logistics • Agro-industrial, commercial and residential uses • Community involvement and other social features
Development objectives	• Basic agro-industrial park • Agro techno- or science park • Agro eco-industrial park • Agropark with SEZ status	• Agro-industrial competitiveness • Innovation and technology transfer • Green agroprocessing • Special regulatory and fiscal regime
Ownership	• Public agroparks • Private agroparks • Public-private agroparks	• Mostly public sector driven • Mostly private sector driven • Public-private driven
Starting-point	• Brownfield initiative • Greenfield initiative	• Based on existing development • Developed from scratch

There are both differences and similarities between Agroparks, Agricultural parks, Eco-Industrial Parks (EIPs), and Technopoles. However, recently, EIPs became subjects of high interest by governments and businesses, due to their ability in providing solutions for the use of recycling, waste, and emissions that benefit the local environment and neighboring communities. The success of AIPs in achieving their developmental goals rests on initial key criteria that highly depend on the objectives of decision makers in each country's context. Generally as a model, AIPs should be adopted by governments as a tool to add value in agriculture through processing, support a multiplicity of agrifood chains, and develop cities and their agricultural locality. In this respect, departing from this initial criteria would render AIPs as the most efficient instrument.

The actual implementation of AIPs on a national scale includes challenges and complexities that have to be taken into consideration and tackled through a consultation process, as well as an economic analysis process, in order to ensure its success and the early buy-in of stakeholders. The success of an AIP depends largely first on setting clear objectives and aligning stakeholders on these objectives. For AIPs to be implemented on a national scale, a political will must be present to assume the responsibility of initiation and coordination. Furthermore, the design should be based on sound economic viability that includes a cost benefit analysis to ensure that the intended objectives (including economic sustainability), are going to be met by AIPs. A solid design process typically combines elements of business, scientific and engineering research, that may take the form of techno feasibility studies, prefeasibility studies, comprehensive feasibility studies, and master-planning, complemented with process evaluations, aiming to generate further knowledge. The design of the park encompasses location, physical design and institutional choices. Table 2 below shows some of the main challenges and solutions related to the design phase.

[7] "TERRITORIAL INVESTMENT TOOLS – AGRO-INDUSTRIAL PARKS AND SEZs". Agricultural and Food Marketing Association for Asia and the Pacific.
https://www.google.com.eg/url?sa=t&rct=j&q=&esrc=s&source=web&cd=7&cad=rja&uact=8&ved=0ahUKEwiMlJqN_rTRAhWmI8AKHYE6B1AQFgg6MAY&url=http%3A%2F%2Faigaforum.com%2Farticle2016%2FEthiopia-Competitiveness-Forward-with-Agro-Industry.htm&usg=AFQjCNF6rv4PMZdyUIvt8wEuHK5ibfTcww&bvm=bv.142059868,d.ZGg

Table 2: Agropark institutional design: challenges and solutions[8]

Element	Challenges	Solutions
Objectives	• Lack of clear objectives • Objectives not consistent with the agropark model • Significant differences between partners in terms of objectives, managerial style and other crucial topics	• Conduct multistakeholder meetings to align objectives • Elaborate a park plan or clearly stating the mission, vision and objectives of the agropark • Assess whether the park model is the right policy tool to achieve the stated objectives
Enabling environment and Rule of Law	• Legal framework that does not support the development of agropark (inconsistent, incomplete, inadequate, not enforced) • Wrong policies • Political instability	• Revise relevant legal framework to fill gaps, correct inconsistencies and improve enforcement (by developing special/dedicated enforcement arrangements for the park, in line with its "experimental" nature) • Revise policies impacting agroparks • Introduce mechanisms to prevent or cope with political instability, or to isolate agroparks from it
Transparency, equity and inclusiveness	• Lack of transparent criteria and processes to select park operators and tenants • Bias against park companies on the basis of their origin (domestic versus foreign) or scale (small versus large)	• Elaborate, publish and use transparent criteria for selecting park tenant companies and operators • Generate data disaggregated by origin and scale to be used as decision-making inputs • Introduce a system of checks and balances to avoid discriminating against companies on the basis of their scale/origin • Introduce a system of checks and balances to fight against corruption
Participation and consensus building	• Key agropark stakeholders not involved or involved at a later stage • Lack of coordination mechanisms among park stakeholders	• Launch multistakeholder consultations at the design/inception phase to align views and objectives and ensure participation and consensus • Favour governance models that ensure the participation of public and private park actors and foster coordination among them, e.g. PPPs • Set up park tenant associations • Ensure representation of farmers and other key stakeholders in the management structure of the agropark • Establish high-level and/or technical coordination arrangements among relevant public sector institutions dealing with agroparks (interministerial committees, focal points liaising with central and decentralized agencies, etc.)
Responsiveness	• Bureacratic burden, delays and/or lack of response	• Set up agile governance arrangements such as one-stop-shops for streamlined delivery of public services • Privilege private sector involvement in operation and maintenance of agroparks
Scaling-up strategy	• Too ambitious a project in relation to the funds available and/or the capacities of stakeholders for funding, building and organizing the park	• Develop a concept proposal • Demonstrate a proof of concept • Design and implement scaling-up strategy

[8] "TERRITORIAL INVESTMENT TOOLS – AGRO-INDUSTRIAL PARKS AND SEZs". Agricultural and Food Marketing Association for Asia and the Pacific. https://www.google.com.eg/url?sa=t&rct=j&q=&esrc=s&source=web&cd=7&cad=rja&uact=8&ved=0ahUKEwiMlJqN_rTRAhWmI8AKHYE6B1AQFgg6MAY&url=http%3A%2F%2Faigaforum.com%2Farticle2016%2FEthiopia-Competitiveness-Forward-with-Agro-Industry.htm&usg=AFQjCNF6rv4PMZdyUIvt8wEuHK5ibfTcww&bvm=bv.142059868,d.ZGg

2.2.1 Setting Objectives

There is a strong emphasis that is laid on the importance of investigating the economic underpinnings of AIPs. Economic analysis of projects and operations requires the correct identification of costs and benefits, which are calculated based on available data and well informed assumptions. In particular, the feasibility and Cost Benefit Analysis (CBA) are conducted in order to determine whether there is sufficient socio-economic, financial, and technical justification to undertake the AIP's investment.

The soundness of the feasibility and CBA will depend on the accuracy of data, the comprehensiveness of preparatory work, and the process of decision-making with regards to the objectives (including socio-economic considerations), the industry and value-chain focus, and selection of the location of the AIP. The priority selection criterion should be dependent on the type of agro-industries that would meet the developmental priority objectives and policies of the government. The priority agro-industries for the government could be determined by, but not limited to, the availability of supply of raw materials, markets, and labor. The prioritization should also consider the inter-industry linkages and triggering effect by analyzing the potential linkages with existing industries that could trigger further industrial development.

2.2.2 Site Selection

The site selection for the AIP is a key strategic decision, and should be based on justified economic considerations. Ultimately, the objectives set for the establishment of AIPs would direct the analysis required for the location. The main elements that need to be studied are: the existing potential value-chains, suitability and access to infrastructure, availability of enough demand, proximity to markets, raw materials (fresh produce), and labor. Determining the availability of the land, its ownership, required size, and price should also be considered. These data will 'guide the overall establishment process, serve as inputs to techno-feasibility study, feasibility studies, and the design of the master plan for the Park. Below are the consideration/data needed in determining the best location for the AIP:

- **Infrastructure facilities:** The presence of power, road network, water, railways, airport terminals and telecommunication infrastructure.
    - Power –The presence of power stations, sub-stations and transmission lines within or near the parks.
    - Road network – Road network densities
    - Water – The availability of water for both agriculture and industrial processing by considering the mean annual rainfall, availability of river systems, availability of natural and artificial reservoirs, and groundwater potential.
    - Railways, dry port, airport terminals and telecommunication – Railways and dry ports to be evaluated considering the current and oncoming national networks/projects.
- **Market potential:** A viable market for the products and services available in the park is essential for the successful establishment of enterprises and the long-term commercial viability of the park.
- **Access to commercial and support services:** Commercial and support services such as universities, research centers, technical vocational education and training centers; farmers' cooperatives and unions; and financial institutions, are very important in providing services demanded by the park. Their proximity to the parks needs to be assessed.

- **Concentration of enterprises and attractiveness for investors:** The existence of an industrial base and facilities such as import/export logistics, housing, recreation centers, schools, and other social facilities, are very important for attracting investors/manpower, and retaining those that may establish firms or work there. The density and proximity of these facilities should be taken into account.

2.2.3 Economic and Financial Analysis

In order to ensure the developmental role of the AIP, impact assessments should be included as an integral part of the feasibility study. The effect on smallholder farmers, effect on employment, and effect on environment, are to be analyzed and substantiated by numbers, to form a key performance indictor for the monitoring of the AIP. Roles and responsibilities of the different stakeholders should be set according to the objectives of establishing the AIP. Potential options for organization, management, financing and contractual arrangements (park facilities owned and operated purely private, purely public or PPP), should be studied in the context of the overall objective. Based on the decision on the methodology to run the AIP, policies related to the role of stakeholders, redistribution of gains, and costs, needs to be set.

Box 2: Public vs Private

Agro-industrial parks range from fully public-driven to fully private-driven initiatives, with most of them being public-private driven. Leadership and role allocation among public institutions, entrepreneurs, and other private actors, are key issues throughout all the stages of park design and implementation. These include location selection, design and dimensioning, through operation and maintenance, and monitoring and evaluation (M&E) .

The park manager can be a private or public entity which:

- provides infrastructure, logistics and facilities and specialized high-quality services to tenant companies located in the park premises;
- fosters the creation of competition-cooperation relationships among park firms;
- links park firms to academic and research institutions, so as to form and attract skilled labor and improve access to innovation and new technologies.

Conducting the full feasibility study should either be the role of the Public Entity responsible, if the AIP is to be publicly owned and operated, or the role of the private entity, if the AIP is to be established through PPP or purely private. In either cases, and in order to estimate the socio-economic and financial costs and revenues in the feasibility study, a techno-feasibility study is to be conducted to guide the design of the master plan, and provide the inputs that would affect the financial analysis in the feasibility study; mainly the CAPEX and OPEX (e.g. suggested industries, their capacities, equipment, services, facilities, infrastructure, equipment etc.). Following the feasibility study, the decision to establish the AIP should be based on a careful and detailed cost-benefit analysis, in order to estimate the potential gains/losses of a park. Ideally, the analysis must evaluate real options comparing the net present value of alternative solutions.

3. QALYOUBIA'S SUGGESTED AGRO-INDUSTRIAL PARK

Taking into consideration the Egyptian agricultural and agribusiness context, and international experiences, the applicability of the AIP concept shows a potential to succeed in addressing value-chain constraints present in the market. Hence, the objective of this section is to present the main analysis of a techno-economic feasibility study[9] that was conducted for the purpose of establishing an agro-industrial park in Qalyoubia governorate in Egypt. The study was further verified and a preliminary master plan was designed. The techno-economic feasibility study's objectives:

- Identify viable businesses that could be promoted/established at small and medium scale in the suggested AIP land (based on a territorial mapping, as well as market and value chain analysis);
- Identify agro-processing facilities needed in the AIP, capacities, and surface area needed for the suggested businesses and facilities (verified with industry stakeholders);
- Suggest forward and backward linkage opportunities to existing industries and recommend institutional and informal solutions to improve relationships, communication, and networking, among existing industries within the AIP area and between the AIP area and the market;
- Identify common facilities and services needed and advise on the business model for such facilities and services;
- Design a preliminary master plan based on the study findings.

The following two important elements have been taken into consideration when devising this study:

- The AIP has to be part of an investment facilitation direction in agro-industries and agro-logistics with a focus on SMEs.
- The AIP has to address the creation of an investment environment attractive to investors who are ready to venture in a place where their corporate social values or 'shared corporate-social values' can be implemented.

The methodology adopted in conducting the study included the following steps:

1. Analysis of: (i) Baseline data and value-chains; (ii) understanding of stakeholders (objectives, concerns, and requirements); (iii) Comparative analysis to international experiences in Agro-Industrial Parks.
2. Identification of the strategic framework of the agro-park.
3. Design of the park, including business development units (identifying agriculture & infrastructure requirements, and recommending value-chains).
4. Identification of a model of governance.
5. Preliminary master plan.

[9] The study was financed by UNIDO/GTI and conducted by D'Appolonia (full study is attached)

3.1 Qalyoubia Governorate: Key Features

3.1.1 Location

Qalyoubia Governorate is located near Cairo in the Nile Delta Region. The governorate is a central area for some agricultural production (vegetables, poultry, milk), and its proximity to Cairo makes it a central logistic point that supports large retailers in Cairo for fresh produce. From a logistic viewpoint, the governorate acts as an agricultural market and a distribution platform. The governorate is a central governorate for particular agricultural production, including, among others, vegetables, poultry and dairy.

Box 3: Key Facts: Qalyoubia

- 6th governorate in terms of labor force. (4.9% of total Egyptian workforce)
- 7th most populated governorate (5,265,000 citizens)
- 7th governorate in terms of contribution to total production in Egypt (3.3% of total production in Egypt)
- 7th governorate in terms of contribution to total added value with 2.4%
- 8th governorate in terms of number of establishments (6.5% of total establishments)

Source: CAPMAS

3.1.2 Economic Activity (Market Supply and Demand)

Agriculture and agrifood sectors are the backbone of economic activity but with different roles along the value-chain. The Governorate occupies a position of leadership in some vegetable products with respect to the Egyptian production as shown in the table below.

Table 3: Qalyoubia vegetable production and contribution to the Egyptian market [10]

Product	Production of Qalyoubia / total Egypt	Production of Qalyoubia / Lower Egypt
	(%)	(%)
Celery	100	100
Turnip	21	28
Strawberry	19	31
Carrot	18	20
Lettuce	17	29
Beet	14	33
Cabbage	11	9

[10] Ministry of Agriculture, Economic Affairs Sector, average 2012-2013

Green peas	7	9
Cauliflower	5	11
Spinach	5	19
Squash	3	6

Qalyoubia Governorate is also a central area of production of poultry meat and eggs. *Baladi* chicken eggs, improved breed resulting from the crossing of native and exotic breeds, are mainly produced in the governorate (69.8% of all eggs) from traditional hatcheries (THs), followed by Fayoum (24%). On the other hand, duck eggs production amounts to 11.9% in Qalyoubia, fourth market after Gharbia (38.5%), Beheira (26.7%) and Sharqia (14.6%) governorates.

Though the production of milk is high in the governorate, the sector is still largely traditional with a majority of the population consuming unpasteurized milk, often delivered straight to the households or through vendors. This traditional sector is estimated to represent nearly 80% of the total milk consumers (around 74 liter/capita/year), and about 50% of the produced milk is used for cheese making.

The manufacturing activities represent the biggest share of total added value in the governorate, with more than 78.2%, followed by wholesale trade and retail with only 10.3%[11]. The following table shows the number of formal companies working in the agro-industrial sector.

Table 4: Number of Agro Industries in Qalyoubia[12]

Industry	No. of companies/ plants
Dairy products	13
Jam and Juice	3
Fruit & Vegetables Preparation	80
Food canning (KAHA)	1
Chicken slaughterhouse and refrigeration	2
Flour mill	8
Rice mill	2
Sesame paste	5
Animal fodder	5
Pasta industries	8
Grain purification and packaging	4
Sweets, snacks and chocolate	5

On the demand side, the price index of food consumption is increasing at a rate of 4-5% annually driven by the urban market. This means that the domestic market of Qalyoubia agrifood products is demanding a

[11] CAPMAS

[12] Kompass

higher quality and added services. Thus, the domestic market cannot be seen as an alternative way to allocate lower quality products not suitable for the European market. This means a process of market differentiation is in progress. On the opposite side of quality demanding markets, there is a food consumption pattern of vulnerable households. These show poor dietary diversity and an over-reliance on bread, grains and roots (consumed 7 days a week by 100% of households surveyed), with subsidized bread consumed most frequently (6.4 days a week). Oil, butter and sugar were also consumed daily, and legumes and dairy products consumed 5 days a week, while vegetables and fruit were consumed 6.4 and 1.8 days, respectively. Meat, poultry and fish were consumed just over once a week, with eggs forming the main source of animal protein. High and fluctuating food prices have compounded poorer households' over-reliance on cheaper calorie-dense food with adverse nutritional implications.

As with most governorates in the Delta Region, Qalyoubia is characterized by rapid urbanization and an increasingly more affluent urban population, thus demanding and requiring more food and higher quality. In addition, the potential of export markets and the increased role of large modern retailers require high standards of final food products.

3.1.3 SWOT Analysis

To determine opportunities in the governorate, a SWOT analysis (presented in the below table) in addition to a value-chain analysis to potential products, were conducted. The SWOT analysis has been carried out to address the strategy of development of the whole agricultural area in the governorate.

Table 4: SWOT Analysis Matrix

Strengths	Weakness
Strategic location: Qalyoubia has an ideal geographical location to supply shelf-life sensitive crops locally and internationally (Europe, Middle East, Africa). Favorable climate: Qalyoubia has favorable soil condition, its water supply and climate provide an open-air greenhouse for agricultural commodities. Qalyoubia's latitudinal span offers ideal conditions to expand growing seasons' windows.	Lack of demand-driven orientation: Little market intelligence conducted to understand customer demand. Poor promotion of exports. Little leverage of all distribution channels to provide Qalyoubia's produce. Lack of coordination among exporters: Fierce competition among exporters. No effective body to coordinate efforts of public-private agriculture export stakeholders. Transportation: Insufficient reefer container capacity. High air shipping prices charged by quasi-monopolistic cargo operator. Finance: Access to finance might be also considered as a weaknesses, together with limited use of contract farming (and specific law enforcement).
Opportunities	**Threats**
Untapped potential of small farmers: Large untapped potential from small growers towards export. Substantial human capital development needs for small farmers. Capacity issue: Inadequate educational system and vocational training.	Demand-Driven Strategy Components Assess key target markets and trends. Understand key stakeholders in the value chain. Product Characteristics Understand end-customers' tastes and regional preference for agricultural commodities in various target markets. Provide overall service level that meets clients' expectations.

Capacity building needs for certification, traceability and sanitary or phytosanitary (SPS). Weak public extension services. Qalyoubia small producers have not managed to promote their products that are often perceived as simple commodities, with inadequate quality standards. Associating products to the natural heritage of specific regions. Business Development Services: -Market Information Services -Technical Services -Strategic Alliances -Strengthen Trade Associations	<u>Promotion</u> Differentiate commodity offering through branding association, lack of coordination may be exacerbated by a fragmented agricultural export sector. Product and Service Requirements of Agriculture Commodities Importers. Retailers are increasingly requiring high quality products by imposing certain certification standards, including Global Good Agricultural Practice (GAP) or British Retail Consortium (BRC) Certification.

Qalyoubia presents a clear specialization in production of vegetables, poultry and dairy products but the production is quite fragmented and not organized in value-chains. Consequently, the quality is also quite compromised compared to a demand, domestic and international, requiring higher quality and food safety standards. Specific critical points are highlighted from the SWOT matrix as following:

- Fragmentation of agricultural holdings. Average area of less than 2 feddan/holding, and many with 1 Feddan. There is no institutional framework to address this problem;
- There is an agricultural drainage problem in most of the lands of the region due to the lack of an open or tile drainage system;
- Agricultural extension workers' capabilities are low;
- Youth of the region avoid working in agriculture, many of them migrate to cities or travel abroad seeking better working opportunities, and there is a serious shortage of skilled labor in addition to the lack of training centers;
- Poor capital available to cooperatives, consequently their inability to function on an economic basis, and shortage of administrative and technical skills of the administrative machinery as well as of the elected boards of cooperatives;
- Lack of specialized agricultural marketing companies, lack of sorting, grading and packaging stations, as well as poor availability of marketing information for farmers and their inability to benefit from available information; and
- Inability to use land as collateral to obtain medium- and short-term credit, due to problems in obtaining title deeds.

Based on both the SWOT analysis, and value-chain analysis on the governorate of Qalyoubia conducted by D'Appolonia Techno-feasibility study, the industries/business units that were suggested to be included in the design of the Agro-Park as a direction based on collected data and analysis are; Dairy, Fruits and Vegetables, and Poultry. These were examined in terms of estimated capacities that the Agro-Park can hold. Capacities were based on assumptions that were verified from companies working in the same fields, in addition to soliciting input on the suggested facilities to be present in the Agro-Park. Further modifications were made on the assumptions, and the types of facilities, that were then considered in developing the conceptual design of the Agro-Park presented in the next section.

3.2 Suggested Business Units

Based on the previous context analysis, a priority order of the business units is based on market opportunities or gaps/bottlenecks hampering the development of the value chain within the governorate. The below tables show the assumptions, capacities, and suggested equipment for each Unit; Dairy, Poultry and Vegetables.

Table 5: Vegetables Unit's Assumptions:

Workforce needed and relative production Assumptions	Specifications	Equipment
Assumption of: 1.000 farmers 4Feddan /household 5 ton / Feddan	Focus on Celery, Turnip, Strawberry, Carrot, Lettuce, Beet, Cabbage, Green Peas, Cauliflower, Spinach & Squash through different lines of products and possibly play a double role of aggregating production from the surrounding area and as platform, supporting the market in Cairo and export. Main tasks: 1. Management of the cool chain to qualify the fresh produce. 2. Processing the product to reduce losses and product surplus due to short shelf life during the season in order to stabilize the final price 3. Improvement of the agronomic practices to identify proper varieties and sowing or transplanting.	Coolers, chillers, toilet facilities, condensers, refrigeration units, washing sinks, wrapping equipment, various utensils, scales, conveyors, cling wrap, net bags, polystyrene trays, cartons, adhesive labels, disposable gloves. High pressure processing equipment - High hydrostatic pressure processing (HPP) for processing industry & Ultra high pressure processing (UHP)

Table 6: Poultry Unit's Assumptions:

Workforce needed and relative production Assumptions	Specifications	Equipment
About 200 small farmers 2.000 broiler / breeding per cycle; 4 cycles of production per year; 2 Kg of weight per broiler	1. Organize mobile processing of local poultry breeds in cool chain to facilitate small farmers to reduce the market of live animals 2. Improve feeding by managing and stocking local production of grains (maize, soybean) 3. Specialized milling for animal feed	**Chicken slaughters** For daily or weekly usage directly in farms inn or to be distributed to local market. <u>Structure:</u> Electronarcosis dazer, Funnel shaped slaughterhouse with blood holder, Scalding tank (birds) or hides container (rabbit), Ultimate bird plucker machine, Double basin with knives sterilizer, Conveyor with suitable hooks, Evisceration and washing station, Packing table, Refrigerated room for dazing and storage.

Table 7: Dairy Unit's Assumptions:

Workforce needed and relative production Assumptions	Specifications	Equipment
200 farmers Production of 20 liters / day per cow per 10 months in a year for a total of 6 tons of milk per year per cow; 3 cows per household	Requires modern facility of cool chain and two isothermal vehicles Facility split into • Area for milk receipt • Area for laboratory analysis and quality control • System for milk transformation • System for seasoned cheese • Cheese Salting Area • Area for packaging & labeling	The milk / mini-dairy transformation unit includes machines realized in full compliance with norms that regulate the milk processing. The unit offers the possibility of pasteurizing and bottling milk for direct sale and to transform it in order to obtain dairy products. The mini-dairy is composed of: Electrocoagulator of different types and capacity, Electroagitator, Trolley electric pump, Curdled milk conduit, Molding and stewing trolley bath, Shelf holding fresh cheese, Shelves for maturing cheese, Vapor suction, Refrigerated room.

Further analysis was conducted to verify the assumptions with industry stakeholders, and accordingly the capacities, and thus the areas needed were estimated to the above. In addition, the consultations conducted in that area revealed the potentiality of adding a Bio-gas unit, which would entail the park to be Eco friendly. By having a biogas unit from waste (industrial waste and waste water), the park will be self-independent in fuel and electricity, in addition to having fertilizers as a byproduct. Consultations have also revealed the potentiality of having a market area inside the park in order to have an integrated value-chain. In terms of suggested facilities and services, besides the utilities:

- Labs for quality controls: The presence of a laboratory is important in an industrial area to support the application of international standards of quality of food safety.
- Changing rooms and toilets for personnel: Each business unit and also the labs include a changing room and washing facilities for the personnel.
- Mobile units for semi-processing on site: The mobile unit can be moved and each day based in a different area. About 15-20 small farms in the surrounding of the area can benefit from the service in a day, for a total of 70-100 SMEs per week. Every 20 days, the processing unit can complete the tour covering about 250-300 SMEs.
- Other services that were recommended through consultations: OSS-Operations support system, Logistics Centre, and Utility Management and General Maintenance and Repairs.

Below are representations of the Units in the Park, and the input-output flow:

Figure 2 Units of the Agropark

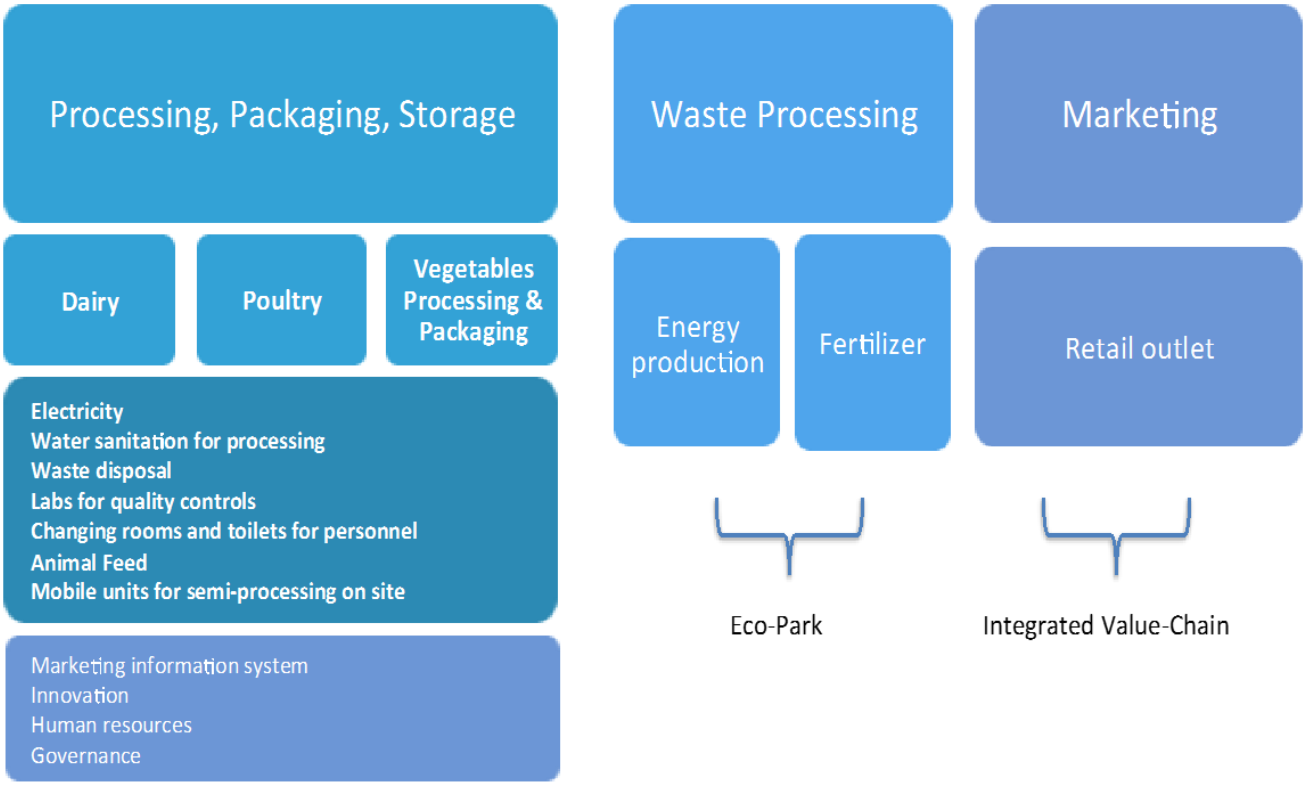
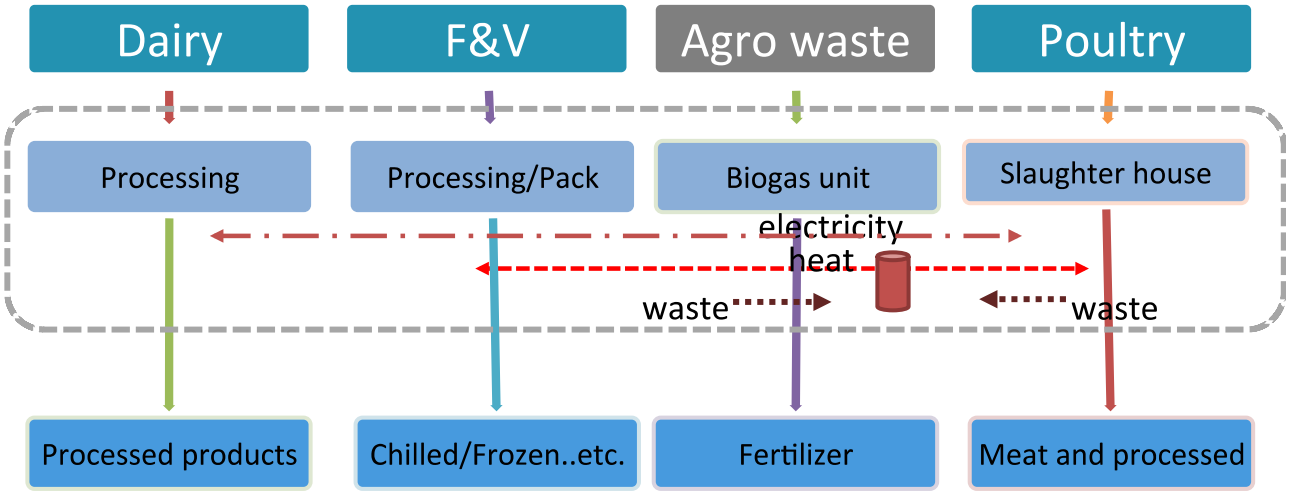


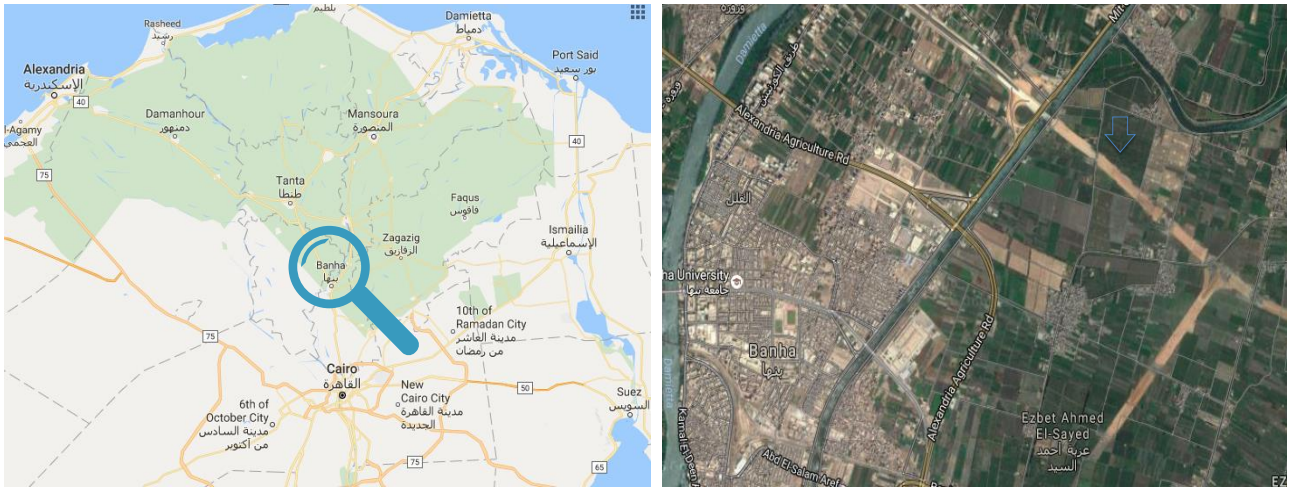
Figure 3 Cycle of the Agropark



3.3 Agro-Industrial Park Location in Qalyoubia: Main Features

The available area allocated to the park is 50 Feddans (about 210,000 m^2), publicly owned by GAFI. The land is directly adjacent to the new regional ring road currently near completion, which provides the ability to boast efficient communication and transportation abilities, as well as competitive advantage in its infrastructure facilities. The distance of the Agropark from key locations is another advantage when analyzing the location. The distance from 'downtown Banha' is 4km, and with the completion of the regional ring road, the access to all major cities and ports are going to be within few kilometers, giving the industries inside the Park a strategic advantage. After the completion of the regional road, the distance from the Pak to 'Cairo airport' is going to be 66km, to 'Suez road' 78km, to 'Suez port' 160km and to 'Alexandria' 170km.

Figure 4 Location of the Agropark in Qaliobeya



3.4 Assumptions for the Qalyoubia's Agro-Park Conceptual Design

The area allocated for buildings is 60% of the land, based on information gathered from the Governorate. The businesses considered to be hosted in the Park were based on the available production of inputs and the value-chain analysis conducted. The Units' areas were estimated based on the suggested capacities that were based on the available inputs, as shown in the table below (minimal modifications were made when designing the master-plan to reflect the actual area):

	Area Assumptions (m2)	Actual area (m2)	
Total Land Area	**210,000**	**210,123**	
Roads and Landscape	**35,000**	**34,578**	
Common Service Areas	**45,000**	**53,756**	
Cold Storage	15,000	15,856	
R&D and Admin Offices	5,000	5,263	3 stories building including labs
FG Warehouses	10,000	17,550	
Local market Area	15,000	15,088	20 outlets
Services & Utilities	**2,500**	**2,785**	
Biogas & Waste Management	30,000	27,705	5 MWH

Production Areas	**97,500**	**91,300**	
Dairy	30,000	22,407	One processing factory plus tanks
Poultry	35,000	34,758	One factory + slaughter house
Fruits & Vegetables Processing	17,500	16,300	One or more units
Packaging Facilities	15,000	17,836	Units

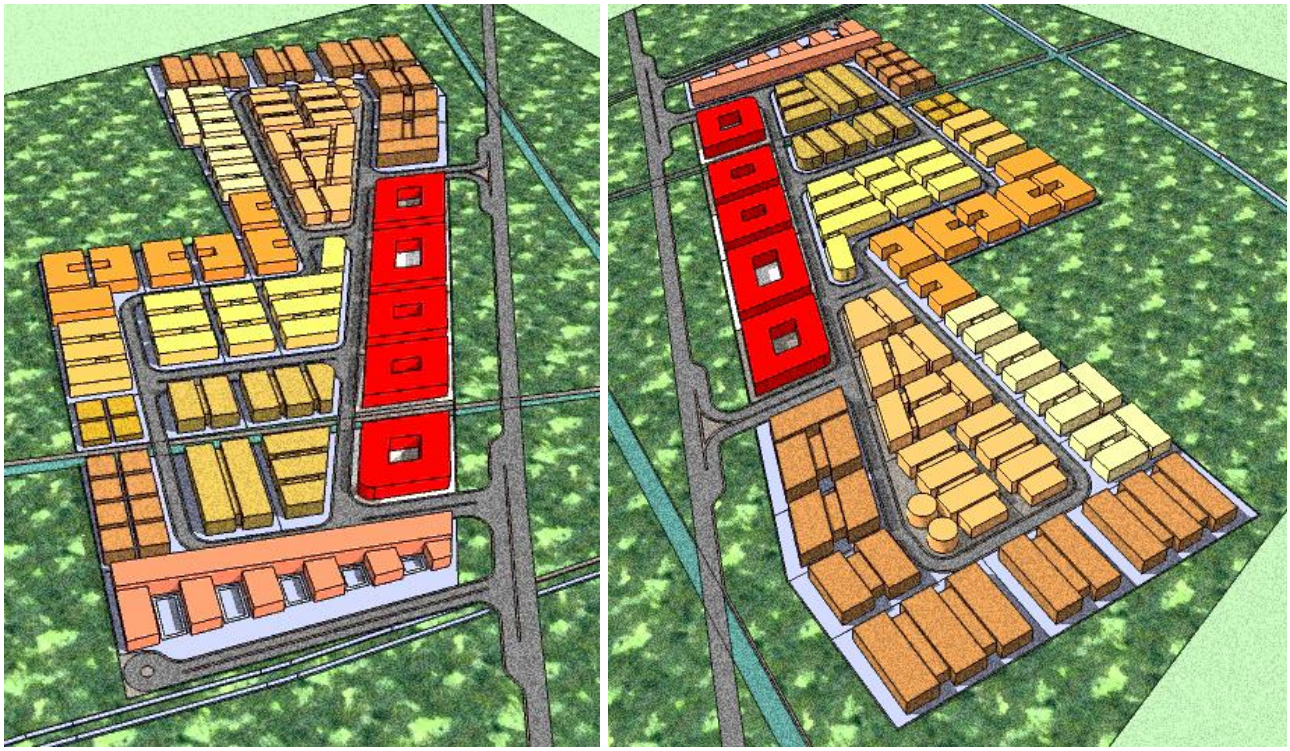
As indicated in the previous sections, two major modifications were added to the preliminary suggested business units and facilities, those are: a Biogas and Waste Management Unit and Local Market. The main business units that the agro-park will focus on are processing, packaging and storage for the 3 main facilities of dairy, poultry and vegetables. These units are operated using services such as electricity, water sanitation for processing, waste disposal, labs for quality controls, changing rooms and toilets, animal feed, and mobile units for on-site semi-processing. The administrative building will include offices for marketing, R&D and innovation, human resources and management. The waste obtained from the three main units will be used to generate energy production through biogas units, and having fertilizers as a byproduct, which will be a self-sustaining cycle for the agro-park.

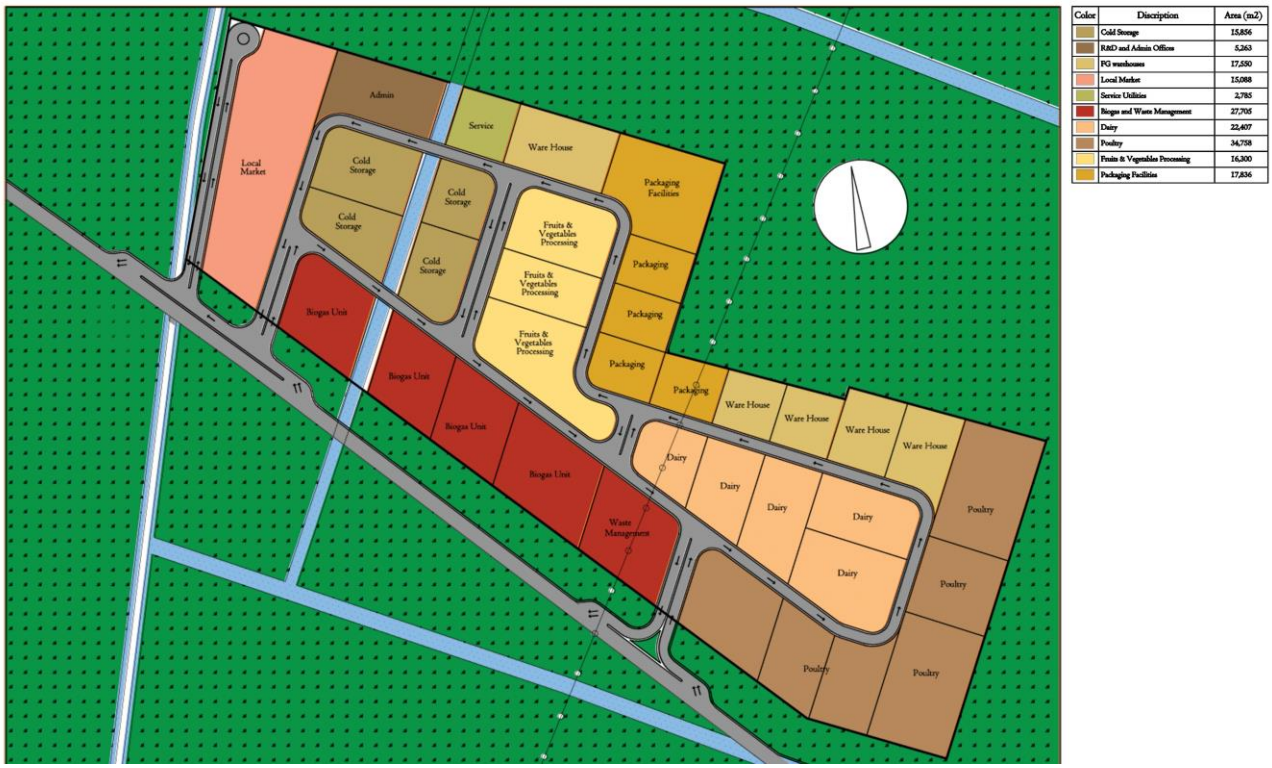
3.5 Conceptual Layout for the Agro-Industrial Park

The master plan developed focused on the main processing units such as dairy, fruits & vegetables to be centered inside the agro-park, with the surrounding lots dedicated to packaging, ware housing, retail and biogas waste management. The design criteria looked at grouping of related functions together, while minimizing the internal roads network to provide clear and smooth accessibility to all plots.

The design objective was focused mainly on four points. A) “Flexibility”: Reaching a flexible master plan that provides an easy expansion for most of the function plots “modularity”. B) “Efficiency”: Making the most possible benefits from the site area in the most efficient way. C) “Well Engineered Planning”: Overcoming site limitations, and making the best use possible from site exposure. D) “Sustainability”: To make the best rational benefits from site recourses, with a wise understanding of the importance of good orientation of buildings providing self-shading. The design took into consideration renewable energy technology implementation, and environmentally cautious water treatments, encouraging the use of recycled materials, and creating a comfortable overall urban/ architectural environment.

Figure 5 The Master Plan of the Agro Park





Color	Discription	Area (m2)
	Cold Storage	15,856
	R&D and Admin Office	5,263
	FG warehouses	17,550
	Local Market	15,088
	Service Utilities	2,785
	Biogas and Waste Management	27,705
	Dairy	22,407
	Poultry	34,758
	Fruits & Vegetables Processing	16,300
	Packaging Facilities	17,836

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	Dairy	22,407
	Poultry	34,758
	Fruits & Vegetables Processing	16,300
	Packaging Facilities	17,836

The main design concept is to provide a “single internal transportation ‘one way’ system” that connects all functions. In the same time, it provides flexible maneuvering connections wherever needed to cut the vehicular trip time within the site premises, while considering the nature of the functions in order to avoid air and noise pollution on site. A one-way circulation internal road was provided to arrange for an uninterrupted connection for all facilities smoothly and with no traffic nodes, considering that parking lay-bys will be provided within every facility to avoid blocking the internal road circulation.
Also, there are only two connections with “two way circulation” that act as a short cut for the vehicular trips within the site limits. Furthermore, there is a separate entrance/exit road with proper parking for the local market area, which facilitates accessibility for visitors with no interruption on the site’s internal traffic network.

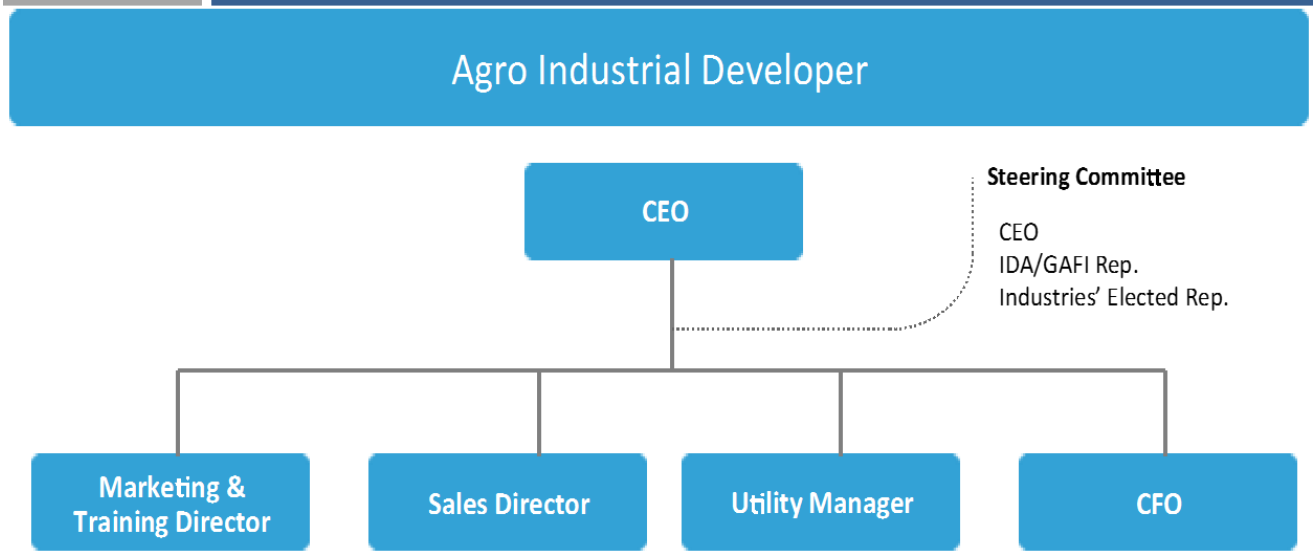
The orientation of the units have been decided where all malodorous functions are allocated in the far south/south east direction, whereas bio gas generation and water treatment facilities are allocated to the south direction. Packaging and storage facilities are allocated at the northern area of the site. All the common services (“cold storages”) are allocated in the middle to be accessible to all functions, and to minimize the energy supply cables from the Bio-Gas energy generation areas. All fruits and vegetables are allocated in the middle, with direct connection to both cold storages and to packing facilities, while dairy facilities are also allocated in the middle, but with a close connection to cold storage and to packing facilities.

3.6 Suggested Management Structure

Regardless of the specific corporate structure, an agro-park should be based on a close private-public partnership (PPP). The private sector plays the role of competing as enterprise and managing operative marketing actions. The public sector has to create the condition of long term competitiveness by supporting innovation, marketing trust, at international level, and local social spillover improving human resources.

The structure of the park should be managed through a simple hierarchal pyramid led by the CEO, heading the marketing and training director, sales director, utility manager, and Chief Financial Officer (CFO). The effectiveness of the organization, however, stands in its ability to have representative membership to be able to tackle directly and fast any concerns. Therefore, a steering committee comprised of elected representatives from the industries in the Agro Park, along with an IDA/GAFI representative, and the CEO, will lead the board.

Figure 6 Management Structure



3.7 Value-added of Qalyoubia AIP

Besides the added financial value, a social-economic value has to be considered as well. The value of the park is thus direct and indirect:

- Direct values: price stabilization; reduction of loss of fresh product; higher market positioning for price and for market share (facing modern retailers). It is estimated that the added-value of products could rise at 20%.
- The target is building the capacities of 200 skilled workers and an additional 200 positions in services, logistics and spillover economy. Indirect values: shift of jobs from low skilled farm work to higher skilled work in processing and managing value-chains; creation of job positions for higher educated technicians and managers. Wages would be 30% higher. Also, farmers will be driven to improve their work conditions, making farming more attractive for youths as well.
    - About 1.000 household farmers will benefit from the facilities to be organized in small co-ops of 30-40 members each.
- Improvement in the quality of work in farmers and environmental effects: the application of standards of good agricultural practices such as Global GAP[13] (AF 3. Workers Health, Safety and Welfare; AF 4. Waste and Pollution Management, Recycle and Re-use; AF 5. Environment and Conservation) to match the European retail standards, will facilitate the international market access and the quality of work and environment as well.

[13] http://www.globalgap.org