

## **THE FUTURE OF LIVESTOCK DEVELOPMENT IN EGYPT FROM PERSPECTIVE OF CURRENT AND FUTURE CHALLENGES**

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### **INTRODUCTION**

Livestock development in Egypt faces a set of current and future challenges that limit the desired development events in this vital sector of agriculture, and the most important challenges can be summarized as follows:

- Lack of available fodder resources needed to cover the nutritional needs of farm animals.
- Low productivity of local farm animals.
- Improving the health and reproductive hygiene of farm animals and limiting the spread of epidemic and imported diseases.
- Climate changes and the limited water resources availability.
- The following is a quick review of those challenges and proposed solutions to address them:

#### ***Lack of available fodder resources needed to cover the nutritional requirements of farm animals:***

- Annually available green fodder is 48 million tons, roughage feed is about 29.6 million tons, and the total production of raw materials and concentrated materials is about 6.5 million tons.
- The annual quantities available of these raw materials do not cover the needs of farm animals (deficit).
- To cover the deficit in available fodder resources, it is necessary to provide about 9 million tons of corn, 3 million tons of meals, 1 million tons of wheat bran, rice bran and maize gluten, in addition to about 0.35 million tons of feed additives annually.

#### ***Suggested solutions:***

- Improving alfalfa productivity through the development and dissemination of new and distinguished varieties, developing seed production and expanding the cultivation of alfalfa incubation.
- Expanding the use of maize silage with expanding the cultivation of yellow maize and developing its feddan productivity.
- Expanding the use of agricultural waste and producing non-traditional fodder and raising its nutritional value.
- Economically developing natural pastures in the North Coast and Sinai.

#### ***Low productivity of local farm animals:***

- Decreased production of local dairy cows and buffaloes.

- Decreased growth rates of local calves compared to foreign varieties.
- Decreased productivity of local sheep and goats compared to foreign ones.

#### ***Suggested solutions:***

Improving the productivity of local cows by crossing with Friesian cows adapted to Egyptian conditions.

Supporting a national program for the genetic improvement of buffaloes and establishing nucleus herds at the level various agricultural areas and the use of artificial insemination with high superior value semen.

- Establishing an integrated system for recording dairy herds and establishing an institutional entity for dairy producers and processors, supporting and developing the infrastructure for the system of collecting and trading milk at the level of small farms.
- Raising the efficiency of red meat production from dairy herds and developing slaughterhouses to achieve health safety requirements for meat, marketing and circulation of red meat.
- Developing sheep, goats and camels production in desert areas, applying a genetic program for selection for Barki sheep and Zaraibi goats, and spreading some distinct breeds of goats (Damascus and Boer) in those areas.

#### ***Improving the health and reproductive hygiene of farm animals and reducing the spread of epidemic and imported diseases:***

- The spread of common and infectious diseases at the level of the Republic and the inadequacy of sovereign immunization programs for infectious and common diseases.
- Low diagnostic, curative and preventive infrastructure for veterinary units in adequate local production of vaccines and veterinary medicines and low efficiency of available veterinary quarries.

#### ***Suggested solutions:***

- Developing and updating the epidemiological maps of infectious, venereal and common diseases and the full coverage of the sovereign immunization programs for those diseases, while tracking the immunization efficiency.
- Supporting and developing the diagnostic, therapeutic and preventive infrastructure for veterinary units.

- Encouraging the local production of vaccines and veterinary medicines in coordination with national companies.

Developing veterinary quarantines, supporting their diagnostic capacity, establishing advanced veterinary quarantines in border areas, supporting the unit for the risk of incoming diseases, and using international information programs.

- Focusing on the role of the Veterinary Services Authority on the legislative, supervisory and extension aspects and working on the privatization of artificial insemination services, veterinary medicine and slaughterhouses.
- Studying the recovery plans and the epidemiological situation of the exporting countries and taking appropriate preventive precautions to avoid the arrival of new strains to the country.

#### ***Climate changes and limited water resources available:***

Possible climatic changes affect the productive efficiency of farm animals through:

- Effect on the amount of food eaten and the balance of energy and metabolism.
- Decreased reproductive efficiency and pregnancy rate.
- Decreased milk production and composition, and Low animal resistance to disease and deterioration of its health and immune capacity.

#### ***Suggested solutions:***

- Applying international best practices to reduce the impact of climate change accurate nutrition and smart waste management.
- Animal health and care monitoring.
- Reducing the consumption of cattle meat.
- The application of smart and disciplined farming systems in animal production farms through the use of sensor applications in smart livestock farming by establishing an agricultural platform for decision-making in the field of dairy production and using sensors to control the status of livestock in dairy farms.
- Breeding the most productive animals and better management of the herd to improve production, including proper health management.
- Better management of pastures and better management of manure and waste.
- Expanding the cultivation of fodder varieties with low water requirements and tolerant of drought and salinity.

#### ***A roadmap for the future of livestock development in Egypt in light of local, regional and global developments:***

The Sustainable Agricultural Development Strategy 2030 was issued in 2009, including the strategy for the development of livestock, poultry and fisheries, and its executive plans, the latest of which is the 2014-2018 executive plan on the basis of 2007 statistics and future expectations. And the revolutions

of January 25 & June 30 and the subsequent political, economic and social changes that affected the target groups of the strategy and operational plans, which necessitates a review of this strategy to take these economic, social and political changes into consideration. In the same period, many large national projects were implemented and planned, a number of which dealt with livestock or their inputs, which requires taking them into consideration.

This period also witnessed tangible global changes, especially in the political and economic aspects, as well as climate changes and their increasing speed, in addition to the emergence of the Corona pandemic (Covid-19). The Middle East and the African region have also witnessed many political changes, such as the turmoil in a number of neighboring countries, and the attention that Egypt gives to its relations with African countries, including development projects in the field of livestock, and encouraging imports from these countries, which has a direct impact on livestock development plans.

Therefore, it was necessary to monitor the local, regional and international changes that occurred during the ten years following the issuance of the Sustainable Agricultural Development Strategy for Livestock 2030 and the extent of the impact of these changes on the programs and operational plans contained in that strategy, and thus special proposals to amend those plans and operational programs in order to achieve the main objectives of the development of livestock, poultry and fish. The 2030 strategy for the sustainable development of livestock, poultry and fisheries was also reviewed in terms of the general objectives and themes, the objectives of each axis, the programs, procedures and projects supporting the achievement of those objectives and expected results.

The per capita consumption of animal protein in Egypt is estimated at about 26 grams / day (in 2018) (compared to the 36 grams / day recommended by international organizations), which confirms the importance of exerting more effort to develop the sector to meet the growing needs of the population, raise the level of nutrition of the citizen and reduce dependence on imports. According to the Sustainable Agricultural Development Strategy 2030, the main objectives of developing livestock, poultry and fisheries are:

- Maximum yield from water and land unit.
- Achieving the maximum degree of integration between animal and plant production.
- Increasing the average daily consumption per capita of animal protein by about 4 grams in 2030.
- Restructuring the consumer basket of animal products in favor of less costly sources.
- Prioritizing the development of animal protein sources on the basis of economic efficiency and the possibility of development in the short term.
- Focusing on the development of small breeders and low-income groups.

- In order to achieve these objectives, the directions of the development of the animal production unit were determined as follows:

#### **Directions to developing dairy and red meat productivity:**

- Dairy production is the main output of cow and buffalo farms, and meat production is a by-product of dairy animal breeding in Egypt. Therefore, it is appropriate for development programs to move towards improving the productivity of the animal unit from milk mainly with the development of its productivity of meat.
- The genetic improvement programs for farm animals mainly aim to raise the dairy productivity of cows and buffaloes to the extent that it can cope with the population increase, and to increase the per capita share of milk from about 61 kg / year currently to reach about 70 kg by 2030, and reduce dairy imports to marginal levels.
- The per capita consumption of red meat is expected to decrease by 0.5 kg every five years as a result of the increasing rise in meat prices with the relative decrease in the purchasing power of the family and thus reducing the annual growth rate of red meat production to 2% in 2030.
- Giving priority to elimination of diseases that threaten the health of farm animals, especially those common to humans and animals that cause heavy losses to dairy herds such as brucellosis, foot and mouth disease, rift valley fever and bovine tuberculosis. And the development of an early warning system against transboundary diseases.

#### **Poultry Productivity Development Trends:**

Increasing the average per capita share of poultry protein by about 2 g/day in 2030. In order to achieve this goal, it becomes necessary to develop policies and mechanisms to achieve the following trends (FAO, 2017):

- Expanding the import of broiler grandparents, mothers of egg hens.
- Continuous improvement of feed conversion rates, and this requires the development of breeding and care methods for herds and the development of feeds so that the metabolic efficiency can be raised and feed consumption reduced.
- Continuous improvement of home-breeding poultry flocks in the rural sector by providing improved local breeds, intensifying vaccination programs and veterinary care for home flocks, and providing alternatives from available sources of feed. As well as appropriate technologies to care for these herds in a way that can be managed efficiently, making them a source of additional income for rural families, and achieving a degree of food security for those families.
- It is a priority to get rid of bird flu disease, which caused great losses to the poultry industry, especially to rural flocks, and to develop methods

of home breeding to limit the spread of the disease.

#### **Fish productivity development trends:**

This sector is the most livestock sector that has great potential for sustainable development due to the abundance of exploitable areas for fish production and the scope for improvement that can be achieved on several axes. The main objective of developing the sector is to double production to reach approximately 3.0 million tons in 2030, which leads to an increase in the average per capita consumption to about 25 kg in 2030. To achieve these goals, it is necessary to emphasize the following trends:

- Sustainable development of production in inland lakes by providing the necessary capabilities and credits to purify those lakes, open and maintain sparks, as well as prevent pollutants from being dumped in lakes, which leads to increased productivity and improved product quality.
- Expanding the fishing range in the Mediterranean Sea to the International Economic Zone, which extends to 200 nautical miles.
- Encouraging investment in marine aquaculture, with a focus on establishing marine hatcheries.
- Development of existing fish farms, and it is expected that this will lead to an increase in fish farm production by about 150% in 2030 compared to the base year.
- In light of local, regional and global developments, and the passage of more than ten years since the launch of the 2030 sustainable development strategy, it has become appropriate to propose modified programs and executive plans to achieve sustainable development of livestock, poultry and fisheries in line with these developments, which is dealt with in detail on the map and can be summarized as follows:

#### **Firstly: Livestock development (farm animals):**

In the light of monitoring and identifying local, regional and global developments that have affected livestock, the programs required for the development of livestock (farm animals) have been proposed as follows:

- A- Program for the development of large ruminants (cows and buffaloes).
- B - Program for the development of small ruminants (sheep and goats) and desert animals (camels).
- C - Animal health and disease resistance program.
- D - The development of fodder resources program.

Each program contained the main elements necessary for its implementation. In this context, several proposals were recommended for the development of livestock, including a set of general and special proposals to counter the effects of the Corona pandemic, and special proposals for the development of fodder resources.

The outlines of the proposed national project for the development of livestock and its main objectives, which are summarized in the following:

- Quality improvement of cattle and buffalo herds and their management systems.
- Increasing milk production, increasing the per capita share of milk and its products to 75 kg/year, and reducing imports.
- Improving the infrastructure of milk and dairy products handling systems, while developing meat production.
- Achieving high-quality production and health safety guarantees for consumption and manufacturing purposes.
- Development of sheep, goat and camel production, especially in desert areas.

**Expected results of the project:**

- Increasing the total production of milk to 9 million tons by 2030.
- Increasing farmers' incomes by about 20-25% from raising dairy animals, as a result of improving health status, increasing productivity, reducing costs and improving marketing.
- Establishing a numbering and recording system that enables sustainable genetic improvement of cattle and buffaloes.
- Providing milk with good specifications to the consumer and to dairy factories.
- Reducing imports of milk and dairy products.

The supporting requirements and research activities in support of the national project for livestock development were also identified.

**The aforementioned project includes the following activities (programs):**

- 1- Supporting and developing the infrastructure of milk collection, handling and processing systems
- 2- Developing the system of veterinary and reproductive care for dairy animals
- 3- Supporting an integrated numbering and registration system for dairy herds
- 4- Genetic improvement of local cows and buffaloes
- 5- Development of sheep, goat and camel production, especially in desert areas
- 6- Maximizing the integration between plant and animal production at the farm level
- 7- Increasing the efficiency of meat production from calves produced from dairy animals

The total estimated investments of the project amount to 1.5 billion pounds, of which the government investment represents about 20%.

**Secondly: the development of poultry wealth:**

The study dealt with the following in details:

- Positive aspects of the poultry industry and why poultry and its products suit the Egyptian conditions? (strength point).
- Obstacles to the development of the domestic sector globally and locally (weakness).
- Re-evaluating the current and targeted situation of poultry production in the light of local, regional and global variables, with defining the goal and objectives in light of monitoring and identifying those variables.
- Factors affecting the selling price of poultry.

- The main activities and proposed programs to achieve the strategy, including about thirteen activities and proposed programs.

***The requirements supporting the implementation of the strategy, including nine main requirements:***

The executive programs to achieve sustainable development of poultry wealth aim to increase the number of grams of protein available per capita by 2 grams / day by 2030, and this requires an increase in the number of bred birds necessary to increase the production of poultry meat (white meat) and table eggs, and this requires an increase in the number of slaughterhouses, wards and the required spaces to raise the numbers of birds that are supposed to increase, in addition to providing the expected feed to be consumed in light of this, and this was specifically estimated in the study.

In order to achieve this increase in the per capita share of poultry protein, it is necessary to increase the production capacity of broilers to about 3.1 billion birds / year (about 2.7 billion birds from the commercial sector and about 0.4 billion birds from the rural sector) and to increase the production capacity of table eggs to about 20 billion eggs/year (about 16.7 billion eggs from the commercial sector and about 3.3 billion eggs from the rural sector) by 2030.

The study provided the specific details to achieve the required increase, as well as the proposed implementation plan for the development of the poultry sector until 2030, and this included the following:

- Main objectives
- Procedural goals
- Required activities
- Entities responsible for implementation
- Achievement indicators
- Funding ratios from the government sector, the investment sector, and other entities.

***Thirdly: Development of the fisheries sector:***

The study dealt with the following in details:

- Advantages of the fish production sector in Egypt.

- The obstacles facing the development of the fisheries sector in Egypt include:

- 1- Legislation and decisions
- 2- Administrative interference
- 3- Data and Statistics
- 4- Fisheries management policies and procedures
- 5- Weak infrastructure for the development of the fisheries sector
- 6- There is a deficit in the fish trade balance
- 7- The multiplicity of problems of workers in the water resources sector in Egypt
- 8- Scientific research and the educational system supporting the sector
- 9- Weak supporting industries
- 10- Absence of investment incentives.
- 11- Absence of long-term strategies and plans that support the sector
- 12- Insufficient equipped means of transportation

- 13- Lack of fish industries in Egypt
- 14- Insufficient marine hatcheries to provide fish and marine shrimp fries
- 15- Lack of adequate infrastructure in the candidate areas for marine fish farming
- 16- Lack of a comprehensive assessment of the current and future lands designated for marine aquaculture
- 17- Pollution of many water sources
- 18- Lack of sufficiently trained manpower to implement marine culture projects
- 19- The spread of unlicensed or violating farms
- 20- The negative role of fish diseases on fish farming (Shaalan et al., 2017;

كتاب الإحصاء السنوي للهيئة العامة لتنمية الثروة السمكية (2019, 2016).

Fisheries development proposals (Burnell, and Allen, 2009; Shaalan et al., 2017; FAO, 2020) include:

- 1- General suggestions
- 2- In the field of free fishing in the Mediterranean and Red Seas
- 3- Development of the northern lakes
- 4- Development of the inland lakes and the River Nile
- 5- Development of fish farming, which includes:
  - Marine aquaculture development
  - Development of aquaculture in fresh and drinking water
  - Development of integrated aquaculture (fish farming in the desert)
  - The development of intensive fish farming
- 6- Development of feed industries
- 7- Establishment of cooperative entities to market fish
- 8- Export of fish
- 9- Activating and supporting the role of scientific research
- 10- Training, mentorship and technology transfer
- 11- Prevention of infectious and imported diseases.

The study listed the main activities (programs) of the proposed project for the development of fisheries resources and includes nine main activities as follows:

- Egyptian Lakes Development
- Improvement and development of the fishing fleet
- Fish market development
- Development of fish farms in fresh water
- Marine aquaculture development
- Integrated fish farming development
- Marine fish hatcheries and hatcheries
- Veterinary follow-up and fish health
- Fish preparing and processing

With a total estimated investment cost of about 3.4 billion pounds, government funding ratios for its components range between 10-85% of the total funding, with the aim of reaching fish production to about 3 million tons annually by 2030, achieving an

increase in per capita share to about 25 kg / year and achieving self-sufficiency.

## FINALLY

The map concludes with the possibility of achieving an increase in the per capita share of animal protein by at least 4 grams per day by 2030 despite the steady population increase, in the case of implementing the proposed programs and operational plans referred to in the map for the development of livestock, poultry and fisheries.

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## مستقبل تنمية الثروة الحيوانية في مصر في ضوء التحديات الحالية والمستقبلية

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تواجه تنمية الثروة الحيوانية في مصر مجموعة من التحديات الحالية والمستقبلية والتي تحد أو تعوق من تنميتها وأهم التحديات يمكن تلخيصها فيما يلي:

- محدودية الموارد العلفية المتاحة واللازمة لتغطية الاحتياجات الغذائية اللازمة للحيوانات المزرعية.
- انخفاض الكفاءة الانتاجية للحيوانات المحلية بشكل عام.
- ضرورة تحسين الحالة الصحية والتناسلية للحيوانات والحد من الأمراض سواء المتوطنة او الواردة لمصر.
- محدودية الموارد المائية والتغيرات المناخية وتأثيرها المحتمل على الثروة الحيوانية.

وسوف يتم استعراض تلك التحديات والحلول المقترحة لمواجهتها في المقالة الحالية . كذلك سوف يتم استعراض خارطة طريق مقترحة لمستقبل الثروة الحيوانية في ظل التغيرات المحلية والاقليمية والعالمية. وقد أكدت تلك الخارطة على إمكانية زيادة نصيب الفرد المصرى من البروتين الحيوانى بمقدار ٤ جرام يوميا بحلول عام ٢٠٣٠ وذلك فى حالة تنفيذ وتطبيق البرامج والخطط التنفيذية المقترحة بالخارطة لتنمية الثروة الحيوانية والداجنة والسمكية.