THE STATE OF ERITREA
MINISTRY OF AGRICULTURE

Eritrea's Agricultural Development Over the Past 35 Years

1991 - 2026

Safe and Nutritious Food for Everyone; Everywhere!

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Eritrea's Agricultural Development Over the Past 35 Years

Water Reservoir Construction

Over the past 35 years of independence, Eritrea has made remarkable progress in transforming its agricultural sector through sustained investment in water resource development; soil and water conservation, and livestock production. These achievements, realized through the Government's own efforts and in collaboration with development partners, have played a decisive role in improving food security, strengthening rural livelihoods, and enhancing the resilience of farming communities across the country.

One of the most significant accomplishments has been the extensive construction of water reservoirs throughout Eritrea. At the time of independence in 1991, the country had only about 130 dams. Today, that number has increased more than sixfold to approximately 850 water reservoirs. These include large strategic dams, medium-sized reservoirs and micro-dams.

The expansion of water infrastructure has had far-reaching benefits. In a country characterized by arid and semi-arid conditions and highly vulnerable to recurrent drought and desertification, water harvesting has become a cornerstone of national development policy. The reservoirs have ensured reliable water supplies for domestic public use, livestock, and also for irrigation contributing significantly to agricultural production.

These reservoirs have helped increase vegetable production by more than six times and fruit production by over 71 times compared to the early years of independence. Farmers in all regions of the country attest to the transformative impact of the dams, noting that they have enabled the establishment of new farms, expanded irrigated agriculture, and substantially improved household incomes and living standards.

The success in water resource development is closely linked to Eritrea's comprehensive soil and water conservation programs. Recognizing that land degradation and water scarcity posed major threats to agricultural productivity, the Government and people of Eritrea made soil conservation a national priority. Over the past 35 years, more than 293,000 hectares of agricultural land and over 135,000 hectares of catchment areas have been rehabilitated through terracing, and other conservation measures. In addition, check dams with a total volume exceeding 6.2 million cubic meters have been constructed to control erosion, enhance groundwater recharge, and reduce sedimentation in reservoirs.

Livestock Development and Animal Health

Eritrea has also registered substantial progress in livestock production and animal health.

A major breakthrough has been the introduction of compulsory vaccination programs to control endemic livestock diseases. Since 2013, around 2.5 million animals have been vaccinated annually against diseases such as Lumpy Skin Disease, Sheep and Goat Pox, Peste des Petits Ruminants (PPR), and Foot and Mouth Disease. Beginning in 2025, the vaccination campaign was significantly expanded, covering more than 6 million livestock and poultry. As a result, disease outbreaks and animal mortality have been reduced to minimal levels, greatly improving herd health and productivity.

The poultry sector has also experienced extraordinary growth. At independence, poultry production was largely limited to traditional village-based poultry keeping systems; and was practiced by relatively few households. To promote modern poultry systems, the Government began importing improved parent-stock breeds, multiplying them locally, and distributing day-old chicks to farmers and households. During the past 35 years, approximately 113,000 parent-stock chickens have been imported, and more than 8 million day-old chicks have been distributed to beneficiaries across the country.

Beekeeping is another area where notable progress has been achieved. In 1991, Eritrea had an estimated 19,000 bee colonies. Through targeted extension services and the introduction of improved hive technologies, this number has grown to more than 46,000 colonies. Traditional hives are gradually being replaced by more efficient modern frame hives and top-bar hives. Currently, 51 percent of colonies are managed using modern frame hives, 41 percent remain in traditional hives, and 8 percent use top-bar hives.

As a result of these improvements, honey production has expanded to all regions of the country. Increased supply has made honey more accessible to consumers, with prices declining by more than half compared to the early 1990s. At the same time, beekeeping has become an increasingly important source of supplementary income for rural households and an environmentally sustainable agricultural enterprise.

Scientific Research and Laboratory Excellence Strengthening National Food and Nutrition Security

National Agricultural Research Institute (NARI)

The National Agricultural Research Institute has played a central role in boosting agricultural productivity and promoting sustainable farming systems throughout Eritrea. Though it assumed its current organizational structure in 2003, the Institute traces its origins back to 1910, making it one of the Africa's oldest scientific institutions. Today, NARI employs 270 staff members, about 80 percent of whom are agricultural researchers and technical professionals.

Conserving Eritrea's Genetic Heritage

One of NARI's most important achievements has been the conservation of plant genetic resources. The Institute has preserved more than 6,300 seed accessions representing approximately 160 species of crops and trees, safeguarding valuable biodiversity for future generations and providing essential raw material for crop improvement.

Developing Improved Crop Varieties

Since 1997, NARI has conducted research at nine agricultural research stations located in Halhale, Gahtelay, Shieb, Akordet, Shambuko, Hagaz, Goluj, Aklelet, and Adi Keih. Through these efforts, the Institute has developed 52 improved varieties of cereals and pulses, including wheat, barley, sorghum, millet, maize, sunflower, and various legumes. These varieties produce yields that are often more than twice those of traditional local varieties and have been distributed to farmers across the country. In addition, NARI has developed and disseminated 34 improved vegetable varieties and 36 fruit varieties, significantly expanding horticultural production and diversifying diets.

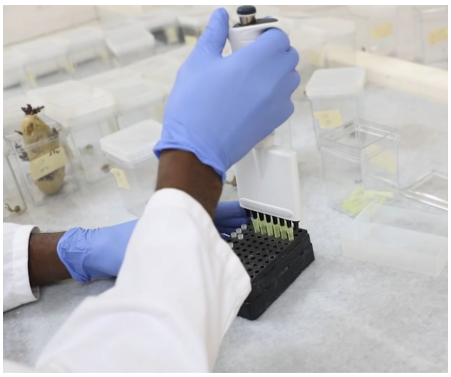
Among the Institute's recent achievements is the release of a hybrid maize variety known as "Halhale," which yields more than 65 tons per hectare and has successfully completed research trials before being distributed to farmers.

Plant Health and Tissue Culture

To ensure that improved planting materials are healthy and disease-free, NARI carries out extensive plant health research and diagnostic testing. The Institute is also strengthening its tissue culture program to produce clean planting materials for large-scale multiplication and distribution to farmers.

Natural Resources Research

NARI's laboratories provide essential analytical services that support sustainable land and water management. Over the years, the Institute has analyzed:



- More than 16,000 soil samples
- Over 500 water samples
- More than 1,750 plant samples
- More than 170 fertilizer samples

These analyses generate vital information that helps improve soil fertility, optimize irrigation, and increase agricultural productivity.

Livestock Research

In livestock research, NARI has evaluated more than 268 forage species, identifying and multiplying promising varieties for distribution to farmers to improve the availability and quality of animal feed. The Institute is also conducting research on livestock breed selection and genetic improvement. For instance, in 2026, it launched a new initiative to develop improved backyard poultry varieties.

National Animal and Plant Health Laboratory (NAPHL)

Protecting Agricultural Health and Producing Vital Vaccines

The National Animal and Plant Health Laboratory is one of the earliest laboratory institutions established in Africa. Constructed in 1903, it was renowned for its high-quality services until 1973. However, from 1974 until Eritrea's independence in 1991, much of its infrastructure and equipment was damaged, and only limited laboratory activities continued.

Following independence, the Ministry of Agriculture, with support from the Government and development partners, undertook extensive rehabilitation and modernization efforts. These included constructing new laboratory sections, expanding electricity and water systems, procuring advanced equipment, training personnel, and ensuring a steady supply of chemicals and consumables.

Institutional Expansion and Infrastructure Development

Before independence, the laboratory operated in only a few sections and examined no more than 600 samples annually. Today, it is organized into seven divisions—five technical divisions and two divisions dedicated to administration and quality management. These divisions encompass 34 specialized units, each containing three to six functional sections. A perimeter fence measuring approximately 700 meters has also been constructed to secure the compound.

Core Functions

The laboratory's major responsibilities include:

- Diagnosis of animal diseases
- Diagnosis of plant diseases and pests
- Testing the safety and quality of animal feed and human food

- Production of animal vaccines
- Establishment and strengthening of regional animal and plant health laboratories in all regions of Eritrea

Rapid Growth in Laboratory Services

Over the past 35 years, the laboratory has greatly expanded both the range and volume of services it provides. Currently, it analyzes approximately 16,000 samples annually. Depending on the availability of samples and laboratory consumables, the facility has the capacity to process more than 12,000 samples per month and produce over 100,000 vaccine doses.

Major Advances in Vaccine Production

Since 2023, based on national priorities and the needs of the ministry, the laboratory has produced more than three million doses of vaccines against Newcastle Disease, Infectious Bursal Disease and Peste des Petits Ruminants (PPR). Using its own technical capacity and internationally accepted procedures, the laboratory has also produced vaccine seed for Infectious Bursal Disease and Infectious Bronchitis. Work is underway to develop vaccine seed for Infectious Laryngotracheitis, while additional priority vaccines are being tested and developed. The laboratory also conducts quality testing on selected imported vaccines.

Human Resource Development

During independence, the laboratory had fewer than 20 employees, with more than 96 percent holding diploma-level qualifications or lower. Today, the workforce has expanded to 183 staff members, of whom 58 percent are women. Among them, 79 employees (43 percent) hold diploma-level qualifications or higher, reflecting significant progress in technical capacity building.

Supporting Facilities and Services

To ensure effective operation, the laboratory has established several strategic facilities, including:

- A Laboratory Animal Center housing sheep, goats, rabbits, mice, guinea pigs and chickens for diagnostic and vaccine production purposes
- Secure solar power system
- wA 700-square-meter central warehouse
- A 500-barrel water reservoir
- A dedicated Maintenance Unit
- A Quality Management System (QMS) Division

Regional Outreach and Academic Support

Regional animal and plant health laboratories have been established in five regions of Eritrea, bringing laboratory services closer to farmers and livestock producers. Moreover, each year, approximately 260 students from colleges and technical institutions receive practical laboratory training. In addition, about 12 undergraduate students and two to three MSc and PhD candidates conduct short- and long-term research projects at the laboratory annually.

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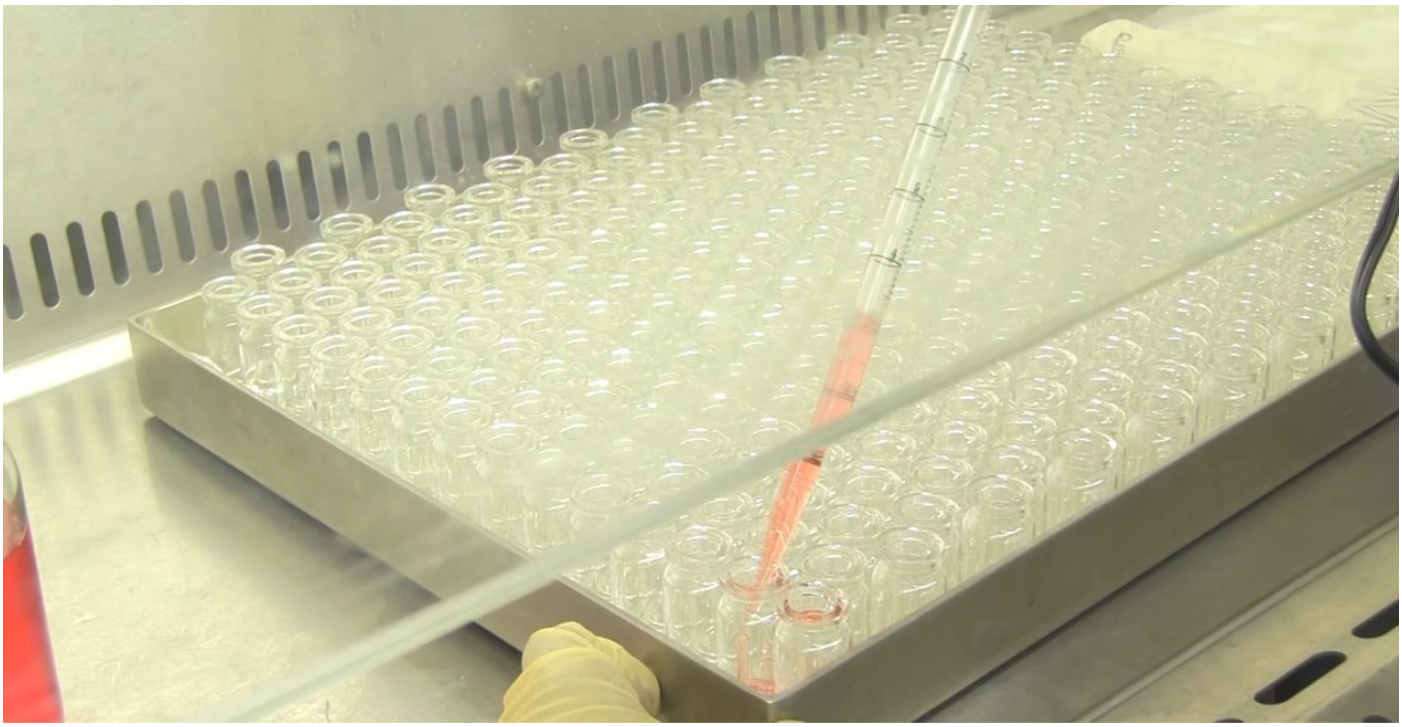

Significant Progress in the Regulation of Agricultural Products

Ensuring Food Safety and Quality

Because food safety begins at the farm level, considerable efforts have been made to put into practice the "farm-to-table" fundamental principle in food safety. Accordingly, a number of inspection initiatives have been implemented to regulate agricultural products at the production stage.

One notable example is the successful control of pesticide-contaminated tomatoes produced in the Gash-Barka Region and sold in the markets of Asmara. Through strict enforcement measures and awareness-raising campaigns targeting farmers, the misuse of pesticides was significantly reduced. Today, apart from occasional incidents, contamination of tomatoes with pesticide residues is no longer a major concern in the market.

In line with good agricultural and manufacturing practices, efforts have also been made to ensure the safety and quality of raw materials used on farms and in agri-food processing establishments. Over the past 35 years, the number of agri-food enterprises processing animal and plant products—including animal feed manufacturing facilities—has increased from around seven before Eritrea's independence to nearly 40 in 2026. This figure does not include more than 25 small-scale sesame oil processing enterprises currently operating in the country.

It is worth noting that, with the expansion of domestic agri-food processing, yogurt that used to be imported from Yemen is no longer in practice, owing to the abundant local production now available in Eritrea.

Plant and Animal Quarantine

The primary objective of quarantine services is to prevent the introduction of plant and animal pests and diseases associated with the importation of plants, animals, and their products, while at the same time ensuring that agricultural products intended for export are free from pests and diseases. Quarantine services are provided at official entry points. Currently, four quarantine stations operate in the country: Asmara International Airport, Massawa Seaport, Assab Seaport, and Tesseney. Continuous efforts are underway to strengthen both human resources and laboratory capacities at these facilities.

Improving Seed Quality

To increase crop production and productivity, several improved varieties of field crops and vegetables have been developed over the past independence years by the National Agricultural Research Institute (NARI) of the Ministry of Agriculture. After evaluation and approval by the National Variety Release

Committee, coordinated by the Regulatory Services Department, these varieties have been incorporated into seed multiplication programs, which have had a significant impact on crop production and productivity. Over the past 12 years, annual production of improved seed has increased from 700 tons to 6,000 tons.

Agricultural Chemicals

Agricultural chemicals can have serious adverse effects on human health, animals, and the environment if they are not properly managed and used. Pesticides, in particular, pose significant risks. In response, a nationwide campaign conducted between 2007 and 2017 led to the safe disposal of more than 360 tons of obsolete pesticide stocks, many of which had accumulated since the colonial era. These stocks were transported to England for disposal in accordance with international standards. Approximately 160 metric tons remain and are scheduled for safe disposal in the near future. In addition, more than 6,500 empty pesticide containers were cleaned and crushed using appropriate technology for safe and easy storage.

With regard to veterinary drugs, 46 metric tons of expired veterinary medicines and vaccines were safely disposed of within the country in collaboration with relevant institutions. An additional six metric tons are expected to be disposed of in the near future.

Natural Resources Regulatory Activities

In collaboration with relevant government institutions and some private entities, the Regulatory Services Department has established a National Database on Fauna and Flora (NDFF), which currently contains records of nearly 5,000 species of fauna and flora. Efforts are underway to make this database accessible to the public. The identification and registration process will also be expanded to further enrich the NDFF and enhance its usefulness to concerned institutions.

Successful Desert Locust Control Strategy

Desert locusts are among the world's most destructive migratory pests, capable of devouring crops and vegetation on a massive scale and threatening the livelihoods of farming communities. Situated along a major desert locust breeding and migration route, Eritrea has long faced this challenge. However, over the past 35 years of independence, the country has achieved remarkable success in preventing and controlling infestations. Through effective early warning systems, regular surveillance, rapid response measures, and active community participation, Eritrea has significantly reduced the impact of desert locust outbreaks. According to the Agricultural Extension Department (AED) of the Ministry of Agriculture reports, these sustained efforts have protected crops, rangelands, and rural livelihoods, making an important contribution to national food security.

A Frontline Nation

Eritrea's geographical location places it directly on the frontline of desert locust breeding and migration. More than half of the country's total land area—approximately seven million hectares—is considered favorable for desert locust breeding.

Of this, around 4.7 million hectares are located along the Red Sea coastal plains, which serve as critical winter breeding grounds. Another 2.3 million hectares are found in the western lowlands, where summer breeding occurs. These ecological conditions make Eritrea one of the most important desert locust habitats in the region.

In addition to native breeding populations, Eritrea is also affected by migratory swarms originating from neighboring countries. Consequently, desert locust management requires continuous surveillance and rapid response measures throughout the year.

Recognizing this reality, the Eritrean Government in collaboration with its development partners such as the Food And Agriculture Organization (FAO), Commission for Controlling the Desert Locust in the Central Region (CRC), International Fund for Agricultural Development (IFAD), Desert Locust Control Organization for East Africa (DLCO-E) etc, adopted a strategy focused on prevention rather than reaction. Instead of waiting for mature swarms to form and spread, agricultural experts target locust populations in their breeding areas before they develop the ability to fly. This early intervention approach has become the cornerstone of Eritrea's success in managing the pest.

Thirty-Five Years of Vigilance

Over the past three and a half decades, desert locust infestations have remained an annual phenomenon in Eritrea. While the intensity varies from year to year, the threat has never disappeared. Some years witnessed particularly severe outbreaks. AED reports indicate that major infestations occurred in 1995, 2006, 2007, 2013, 2014, 2019, and 2020. During these periods, affected areas ranged between 51,000 and 101,000 hectares annually. In total, more than 600,000 hectares experienced desert locust infestations during the past 35 years.

Despite these challenges, effective control operations were carried out in all affected areas. Through coordinated efforts involving agricultural experts, regional administrations, local communities, members of the defense forces, and development partners, infestations were successfully contained before

causing significant agricultural losses. Control operations included vehicle-mounted spraying equipment, motorized sprayers, and manual pesticide application methods. These interventions were supported by extensive field monitoring and surveillance activities that enabled rapid response to emerging infestations. The result has been the protection of croplands, grazing areas, and the livelihoods of thousands of farming and pastoral communities across the country.

The Gadim Halib Desert Locust Monitoring and Control Center

One of the most significant milestones in Eritrea's plant protection efforts has been the establishment of the Gadim Halib Desert Locust Monitoring and Control Center in the Northern Red Sea Region. Located approximately 60 kilometers east of Afabet, the center sits strategically within one of the country's most important desert locust breeding zones. The site was selected following extensive studies identifying the eastern lowlands as critical breeding grounds for desert locusts.

Constructed within seven months, the facility represents a major advancement in Eritrea's capacity to monitor and combat migratory pests. The center serves as a hub for surveillance, early warning activities, operational coordination, and rapid response interventions. Its strategic location enables specialists to closely monitor locust activity and implement preventive measures before infestations spread into agricultural areas. The center significantly strengthens the country's capacity to respond quickly and effectively to emerging outbreaks.

The facility includes administrative offices, dormitories, conference facilities, maintenance workshops, storage areas, garages, water systems, and other essential infrastructure required to support year-round operations. More importantly, it represents a transition toward a more proactive, efficient, and technologically advanced approach to pest management.

Partnership and Collective Action

The success of Eritrea's desert locust control efforts has been built upon strong cooperation among national institutions, local communities, and international partners. The Gadim Halib facility was established through collaboration among the Ministry of Agriculture, relevant national construction companies and institutions; the Food and Agriculture Organization of the United Nations (FAO), and the Commission for Controlling the Desert Locust in the Central Region (CRC).

However, infrastructure alone does not explain the country's achievements. At the heart of Eritrea's success lies the active participation of local communities, which provide early reports of pest activity, support monitoring teams, and contribute to control operations. Regional administrations and local authorities have also played a vital role in mobilizing resources and coordinating responses whenever outbreaks occur. This collective approach has enabled rapid intervention and has significantly reduced the potential impact of infestations on agricultural production and food security.

Beyond Desert Locusts

While desert locusts remain the primary concern, Eritrea's pest management efforts also address other migratory threats. Tree locust infestations, which first appeared in limited numbers in 2019, have emerged as an increasing challenge. Between 2023 and the first quarter of 2025, these infestations affected more than 45,000 hectares in the Gash-Barka Region and parts of the Anseba and Southern Regions. Through coordinated public participation and government intervention, the outbreaks were successfully controlled.

Eritrea is also vulnerable to invasions of Quelea quelea birds migrating from Sudan, particularly in the Gash-Barka Region. Over the years, successful aerial and ground spraying campaigns, in collaboration with DLCO, were conducted to control infestations across more than 5,000 hectares of breeding sites. These experiences have strengthened the country's overall capacity to manage migratory pest threats through integrated monitoring, surveillance, and rapid response systems.

In addition to its success in controlling desert locusts and other migratory pests, Eritrea also demonstrated its capacity to respond effectively to emerging agricultural threats. In 2018, Fall Armyworm emerged as a major threat to agricultural production

across many African countries, causing extensive damage to maize and other crops and raising serious concerns about food security throughout the continent. Although the pest was detected in Eritrea, the country largely escaped the devastating impacts experienced elsewhere.

According to reports from the Agricultural Extension Department, a preventive and integrated control strategy was immediately implemented. The response involved extensive public awareness campaigns, close collaboration with farmers and regional administrations, and the widespread application of mechanical control methods.

Particular emphasis was placed on the early identification and destruction of infested maize plants before the pest could spread further. Through coordinated community action and continuous monitoring, infected crops were removed and disposed of promptly, significantly reducing the risk of infestation.

As a result of these timely interventions, Eritrea successfully prevented the widespread establishment of Fall Armyworm and protected other crops from serious damage. The experience highlighted the importance of early warning systems, public participation, and rapid response mechanisms in safeguarding the country's agricultural sector from emerging pest threats.

Looking Ahead

As climate variability, changing ecological conditions, and cross-border pest movements continue to influence agricultural production, vigilance remains essential. The Ministry of Agriculture's long-term strategy emphasizes early detection, continuous surveillance, scientific research, rapid intervention, and regional cooperation. Eritrea's membership in regional organizations dedicated to desert locust management further strengthens these efforts through information sharing, technical cooperation, and coordinated action.

After 35 years of independence, Eritrea's achievements in desert locust control demonstrate what can be accomplished through foresight, commitment, and collective action. From remote monitoring stations to frontline field operations, thousands of individuals have contributed to protecting the nation's crops, rangelands, and food security.

The Gadim Halib Desert Locust Monitoring and Control Center now stands as a symbol of that commitment—a fortress against one of agriculture's oldest enemies and a beacon of innovation in plant protection. Through persistence, scientific planning, and cooperation, Eritrea has shown that even the most destructive migratory pests can be effectively managed, ensuring that the country's agricultural future remains secure, productive, and resilient.

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Gadim Halib Desert Locust Monitoring and Control Center

Editor-in-Chief: Ermias Solomon, Director of Public Relations Division
Email:- ersohab@gmail.com, Tel: 292-1- 182225/ +291-7143877
Lay-out : Sophia Fekadu
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