TROPICAL LEGUMES

Accelerated breeding and seed delivery of critical legume crops in Africa and Asia

GHANA FACTSHEET

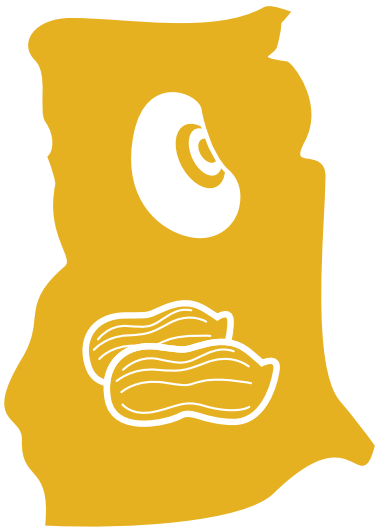
The Tropical Legumes projects were a series of initiatives that developed and distributed high-yielding, climate-resilient food legume varieties to millions of poor farmers across Africa and Asia. Implemented over a 12-year period with US$67 million in funding from the Bill & Melinda Gates Foundation, the projects were led by three international CGIAR research organizations – the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), the International Center for Tropical Agriculture (CIAT), and the International Institute of Tropical Agriculture (IITA) – and executed by national and regional partners.

In Ghana, the Tropical Legumes projects partnered with the Council for Scientific and Industrial Research (CSIR), and collaborated with several other organizations to exchange knowledge and resources, including the Alliance for a Green Revolution in Africa (AGRA), the Kirkhouse Trust, and the Feed the Future Lab at the University of California, Riverside.

CONTEXT

The Tropical Legumes projects focused on delivering improved high-yielding and climate-resilient cowpea and groundnut varieties in Ghana. In 2018, the country produced 215,000 tons of cowpea grain, the fourth highest in the world, and 520,000 tons of groundnut grain.[a] Despite these crops' substantial importance to household incomes and food and nutrition security, their yields remain too low to reach their full potential in the national economy and national efforts against malnutrition. As a rich source of essential proteins and micronutrients, cowpea and groundnut could help reduce diabetes and the high rate of anemia among Ghanaian women of reproductive age.

Cowpea and groundnut are important crops in Ghana. In 2018, Ghana produced 215,000 tons of cowpea grain and 520,000 tons of groundnut grain.[a]



APPROACH

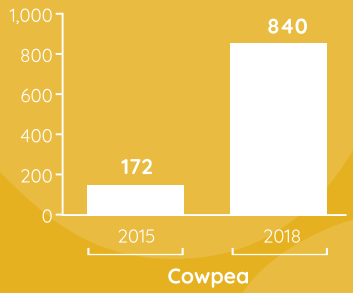
STRENGTHENING BREEDING CAPACITY

New irrigation facilities to increase the number of generations per season and thus the pace of variety development were a critical focus of efforts to strengthen the capacity of Ghana's crop improvement programs. The Tropical Legumes projects also prioritized training for crop breeders and research technicians on topics that ranged from genomics and molecular breeding to the adoption of modern data collection tools. As a result of support provided by the Tropical Legumes initiatives, Ghana's groundnut improvement program was achieving 20 crosses each year by 2018.[b]

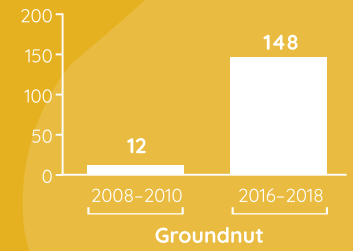
CROP FOCUS:

Cowpea Groundnut

Improved seed produced (tons/year)[b]



Improved seed produced (annual average tons/year)[b]



[a] FAOSTAT: www.fao.org/faostat/en/

[b] Tropical Legumes III, Final Narrative: https://tropicallegumeshub.com/rc/tropical-legumes-iii-final-report/

GHANA: FACTSHEET

DEVELOPING FARMER-PREFERRED VARIETIES

With support from the Tropical Legumes projects, Ghana's crop improvement programs developed improved climate-resilient varieties of cowpea and groundnut – which were high-yielding, drought-tolerant, and pest and disease-resistant.

IMPROVING SEED DELIVERY SYSTEMS

Investments in seed delivery systems involving farmers, farmer groups, and informal seed companies helped improve smallholder access to the improved cowpea and groundnut varieties. Seed multiplication at scale was made possible by an ambitious capacity-strengthening program that provided training for almost 11,900 people in seed production, management, and marketing.[b] The new varieties were also widely promoted: **between 2015 and 2018, over 1,000 awareness-raising events** (demonstration trials, field days, and exhibitions) were held.[b]

OUTCOMES

As a result of investments made by the Tropical Legumes initiatives, production of improved seed increased substantially over the course of the initiatives. Cowpea seed production increased from **172 tons** in 2015 **to 840 tons** in 2018. Groundnut seed production rose from an average of **12 tons/year** (2008–2010) **to 148 tons/year** (2016–2018).[b]

The Tropical Legumes initiatives estimate[c] that enhanced seed production has been sufficient for an increasing number of households to plant seed. In 2015, the amount of cowpea seed produced would have been sufficient for **42,000 households**, but by 2018 this figure had grown to **210,000 households**. For groundnut, the annual average increased from **600 households** in 2008–2010 to more than **7,400 households** in 2016–2018.

Estimates[c] demonstrate the growing economic value of the improved varieties. In 2015, improved seed was sufficient to produce cowpea grain worth an average **US$4 million per year**, increasing to **US$27 million** in 2018. For groundnut, the equivalent figures were **US$79,000** in 2008–2010, rising to **US$834,000** in 2016–2018.

The projects made specific efforts to reach women farmers and attempted to enhance their access to capital so they could afford to purchase the new varieties. Ghanaian partners worked through small-scale community financial institutions in six villages in northern Ghana – known as Village Savings and Loans Associations (VSLAs) – to extend loans to women. The additional income meant that women in the villages were able to produce five tons of quality certified seed.[b]

LOOKING AHEAD

The gains of the Tropical Legumes initiatives are now being consolidated by a new project, Accelerated Varietal Improvement and Seed Delivery of Legumes and Cereals in Africa (AVISA), which is building on the experience of its predecessors to continue enhancing the efficiency and effectiveness of breeding programs and seed systems in Ghana and other African nations.

[c] Calculations are based on an average plot size of 0.2 hectares per household, seeding rate of 0.02 tons/hectare (cowpea) and 0.10 tons/hectare (groundnut), and a price/ton of US$465.20 (cowpea) and US$452.70 (groundnut). These prices are averages taken from FAOSTAT figures for 2007–2017.

ALMOST
11,900
PEOPLE WERE TRAINED IN SEED PRODUCTION, MANAGEMENT, AND MARKETING

BY 2018, **20** GROUNDNUT CROSSES WERE ACHIEVED EACH YEAR

Find out more: Varshney, R.K., Ojiewo, C., Monyo, E. A decade of Tropical Legumes projects: Development and adoption of improved varieties, creation of market-demand to benefit smallholder farmers and empowerment of national programmes in sub-Saharan Africa and South Asia. *Plant Breeding* 2019; 138: 379–388.

TROPICAL LEGUMES HUB

Find out more about the Tropical Legumes projects at **www.tropicallegumeshub.com**

PARTNER: Council for Scientific and Industrial Research (CSIR) · Ghana ·

LED BY: ICRISAT International Crops Research Institute for the Semi-Arid Tropics · CIAT · IITA Transforming African Agriculture

SUPPORTED BY: Bill & Melinda Gates Foundation · CGIAR Research Program on Grain Legumes and Dryland Cereals