

# Reducing post-harvest losses and utilising agricultural residues

Implemented by the *Fund for the Promotion of Innovation in Agriculture (i4Ag)*  
As Part of the Special Initiative *Transformation of Agricultural Food Systems*

## The Challenge

### High post-harvest losses and their impact on food security in West and East Africa

High post-harvest losses (PHL), including food wastage at the production level and during initial processing stages, have become a pressing concern, as they significantly affect the food security of many people in West and East Africa. The health-threatening contamination of grains by aflatoxins is of particular concern. These losses can jeopardise the food security of low-income populations and, depending upon the product and region, can reach up to 40 % of the harvest in Ghana, Kenya and Nigeria, where the project is being implemented. The underutilisation of agricultural residue, particularly cassava peels, has also been observed. This waste is a missed opportunity for animal feed and extra income. At the same time, the majority of post-harvest activities, which often involves strenuous physical exertion and considerable time investment, are carried out by women and young people (e.g. cassava peeling). Further, PHL account for approximately 4.4 gigatons of greenhouse gas emission annually worldwide. These include on-farm agricultural emissions and energy used to produce, transport and store food that is ultimately lost.

## The Innovation

### Innovations reshaping post-harvest management and processing in agriculture

Recent innovations in technology and digital solutions, along with novel business models offer solutions to reduce PHL and add value to agricultural residues.

- **Smart grain storage in Ghana and Kenya:** Saving Grains is enhancing hermetic storage bags with sensor technology, creating a public aflatoxin contamination warning system.
- **Eco-friendly grain drying in Ghana:** Kwame Nkrumah University of Science and Technology (KNUST) developed an eco-friendly and cost-effective grain drying technology using local biomass to enable loss-free storage and to prevent aflatoxin contamination in stored food. The dryer will be validated economically and ecologically.
- **Optimising crop storage with DryCard™:** The DryCard™, developed by the University of California, is a device for measuring moisture content in grains providing a cost-effective solution for improving crop storage practices. The extension to rice will be examined
- **Improving cassava processing in Nigeria:** Clayuca Corporation will introduce a new cassava processing technology in Nigeria that requires no prior manual peeling, saving water and time while increasing processing capacity. The end products are high-quality cassava flour for human consumption and high fiber cassava flour for animal feed.

## The Main Objective

*Support smallholder farmers and SMEs to use innovative approaches in the post-harvest sector to increase income and revenues.*

Name of the Project	Reducing post-harvest losses and utilising agricultural residues
Name of the Global Fund	Fund for the Promotion of Innovation in Agriculture (i4Ag)
Commissioned by	Federal Ministry for Economic Cooperation and Development (BMZ)
Project Region	Ghana, Kenya, Nigeria
Implementing Partners	African Agricultural Technology Foundation (AATF), Clayuca Corporation, Saving Grains 301 GmbH, AgriDrive Ltd.
Duration	08/2023 - 01/2027



From left to right: Transportation of Cassava/ Wet and mouldy maize with high aflatoxin/ Village demonstration with demo bag of groundnuts

- **Income generation through digitally supported business models:** An innovative app offering features for transactions, payments, and traceability enables village entrepreneurs to enter the grain trade. Small-scale farmers benefit from rising prices after the harvest through profit-sharing in this social business model. In the cassava value chain, an innovative operational model for mechanical cassava processing is being developed. It involves introducing improved cassava varieties with low hydrogen cyanide content, mechanising cultivation, harvesting and processing, and incorporating a digital solution as a prerequisite.

## Methodological Approach and Innovation Partnership

The project is being implemented via two integrated development partnerships with the private sector. In the grain sector, the German company Saving Grains 301 GmbH will innovate in the grain value chain in Ghana and Kenya with app-based solutions and hermetic storage models. In the cassava sector, the Nigerian provider of agricultural services Agridrive Ltd. is the implementing partner. Collaborating with the nonprofit organisations African Agricultural Technology Foundation (AATF) and Clayuca Corporation, they aim to enhance the cassava value chain through the mechanisation of cultivation and processing in Nigeria.

## Most Important Activities

- Training on post-harvest management and further processing
- Introduce an innovative cassava processing machine and develop operating models in Nigeria
- Further training on technical and entrepreneurial skills for prospective village entrepreneurs
- Conduct awareness-raising campaigns

## Sustainability and Scaling Strategy

The training measures ensure that awareness of the added value of innovative methods and technologies is retained. By consistently addressing the cross-cutting theme of developing gender-sensitive business and operational models, the measures ensure that affordable access to innovative technologies for the target group is guaranteed beyond the project's completion. This is crucial for the continued application and increasing dissemination of these technologies due to their income-enhancing effects. Supplementary measures to create market access in the cassava value chain, or to improve it in the grain value chain, will also contribute to effectiveness after the project's conclusion.

Through collaboration with advisory services and the dissemination of learning experiences to relevant stakeholders, the acquired knowledge and derived gender-sensitive recommendations for action are locally embedded and promoted. The implementation of the measures in cooperation with private sector partners who are interested in the long-term development and establishment of technologies and the exploration of new markets further ensures the sustainability of the approach. The continuous involvement of these partners guarantees the ongoing development and widespread adoption of the technologies even after the project concludes.

**15 %** reduction in post-harvest losses

**26,000** smallholder farmers, of whom half are women, trained in improved post-harvest management and further processing

**23,000** smallholder farmers, of whom half are women, increase their income

**2,440** SMEs, of whom 1,220 are run by women, increased their revenues

The project contributes to the achievement of these Sustainable Development Goals (SDGs):



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On behalf of Federal Ministry for Economic Cooperation and Development (BMZ)