Block 2

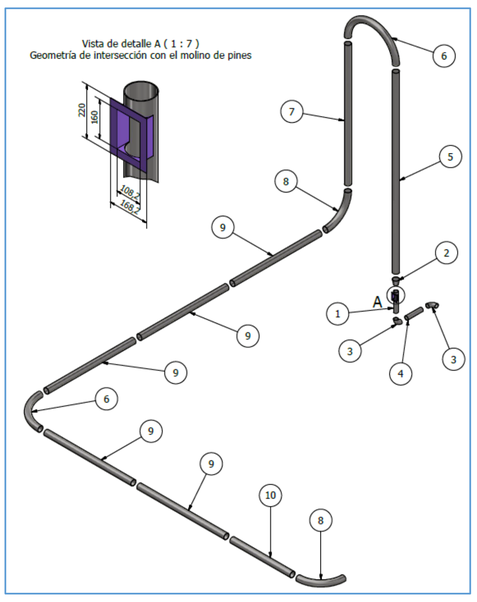
Energy-efficient technologies for small-scale cassava processing

TECHNOLOGY DESCRIPTION

Small-scale energy-efficient technologies are essential to reduce production costs and environmental impacts of cassava processing, and thus to ensure a more sustainable growth of the cassava industry, as demand for cassava-based products increases with the needs of growing urban populations.

The RTB Post-harvest project "*Driving livelihood improvements through demand-oriented interventions for competitive production and processing of RTBs*" (2013-2016) has developed energy-efficient technologies, including flash drying, rasping, centrifugal sieves; re-use of water within the process, etc.

By reducing production costs, these technologies make cassava processing more accessible for small-scale processors and investors, thus generating new economic activities and employment.



Energy efficient flash dryer design

END USERS AND BENEFITS

The end users are processors of cassava, in particular at small-scale: flour (HQCF), starch, gari, fufu, etc. The end users were involved through surveys and interviews in Africa, Latin America and Asia to determine which unit operations need efficiency improvements in priority. Improved technologies were developed and tested in collaboration with three small-scale cassava processors in Nigeria, Tanzania and Colombia.

End-users are mainly households employing family members, or small enterprises. Both men and women work in cassava processing, although tasks differ and men tend to be involved more in operating machinery, while women are involved in manual tasks (peeling and washing, roasting).

SCALING STRATEGY

By partnering with small-scale processors, equipment manufacturers and investors who have expressed interest in more efficient cassava processing, we will integrate selected energy-efficient technologies in existing cassava factories. The improved factories will serve as demonstration platforms available for other processors to learn about and adopt new technologies. This process can be strengthened by organizing capacity building workshops for processors.

This scaling strategy has proven effective for cassava starch production in the Cauca region (Colombia), where innovations (sloped factory layout, sedimentation canals) introduced in one factory in partnership with CIAT and CIRAD have been adopted by most processors over the past 20 years.

LEVEL OF ADOPTION OR USE

In 2017, two improved flash dryers are in use in Nigeria, and one in Tanzania. Each dryer can produce 2 tons of HQCF/day, and supply markets in the cities, contributing to food security for 1000-2000 consumers per day. One improved flash dryer is under construction at CIAT (Colombia), and will serve as training platform for producers of cassava starch and flour. Other energy efficient technologies (rasping, pressing, etc.) are currently under development or reaching demonstration stage.

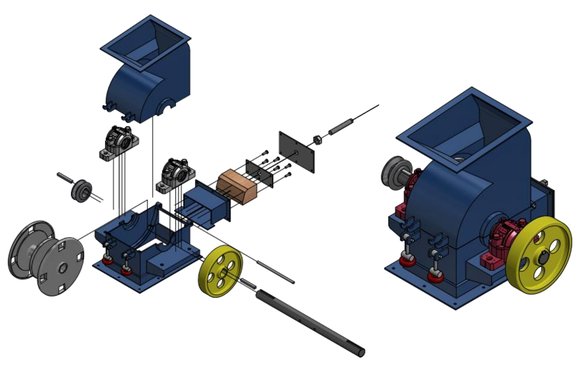
By 2020, we can establish 4 to 5 demonstration platforms of energy-efficient technologies, in Africa (Nigeria, Tanzania, Cameroon, Benin), Latin America (Colombia), and Asia.

End-users most likely to adopt these technologies are small-scale entrepreneurs processing 5 to 20 tons of cassava roots/day. These entrepreneurs are willing to expand their production, and have access to investment capital.

CRITICAL GAPS AND NEXT STEPS

The next steps are to strengthen existing partnerships, and establish new ones, to invest in and demonstrate energy-efficient technologies. Business models involving private investments or public-private funds need to be developed. We will also explore opportunities to organize capacity building workshops.

A critical gap is to assess and mitigate the potential negative effects of adoption of improved technologies within the context of the local value chain, such as potential loss of employment and revenues, in particular for more vulnerable stakeholders such as women and youth.



Improved rasper to increase production capacity

KEY PARTNERS FOR SCALING

Small-scale cassava processors and investors: Deriyuca (Colombia), Niji Lukas (Nigeria)
Equipment manufacturers: Niji Lukas (Nigeria)
Universities (capacity building): Universidad del Valle (Univalle, Colombia); Federal University of Agriculture, Abeokuta (Nigeria)
CGIAR centers: CIAT, IITA, CIRAD

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