Abstract

Processing Africa’s annual cassava roots output of 150 million tons (Mt) results in nearly 36 Mt of incremental cassava peels waste that litter the environment and pollute the air and underground water. Human population and incomes are growing faster than animal source food (ASF) supply while there is a critical shortage of high-quality animal feed and feed resources. The search for new feed resources to meet this ever-increasing demand for ASF given a fixed land base became imperative and yielded an innovative way of quickly processing the abundant wet cassava peels into safe, hygienic, energy-rich animal feed ingredients using simple machines and equipment (Figure 1). The CGIAR Program on Root Tuber and Bananas (RTB) through its Scaling Fund Project is working with IITA, the public and private sectors to scale the innovation, starting in Nigeria.

Description of the Technology

The technology depends on induced rapid water loss from fresh peels to drastically reduce drying time from 3-4 days to 6-8 hours of sun-drying. The processing steps involving grating, dewatering, fermentation and drying (Figure 2) result in safe hydrocyanide levels while the speedily processing limits fungal contamination especially aflatoxins in products (Table 1).

Changes Needed for Adoption and Enabling Conditions

A vision for unlocking the potential of cassava peel as a high quality animal feed ingredient was developed together with key partners from across sectors at the initial Theory of Scaling meeting showing shared ownership for the identified ways forward from the current to the wanted situation pillars (Figure 4). In between are the ways forward derived from unpacking the innovation into “hard” (red boxes) and “soft” (other colours) components both of which must be addressed to enable scaling.

Critical Activities for Scaling to Happen

- Increasing awareness among entrepreneurs of the existence of the innovation
- Mobilising a critical mass of adopting to kick off industry demand as feed millers need a threshold quantity of guaranteed supply to switch formulae among feed ingredients (training interested entrepreneurs to produce safe and hygienic products that meet industry standards; facilitate emergence of aggregators)
- Overcoming age-old myths of cyanide poisoning from consuming cassava peel products (publishing and promoting nutrient profiles of the new products showing safety)
- Linking to financial/credit support services (MoU with Bank of Industry to expedite credit delivery to trained processors is in place)
- Establishing products standards (working with Standards Organisation of Nigeria to constitute a Technical Committee for this purpose)
- Supporting industrialist with reliable technical details to enable establishment of plants (cash flow examples for various production modules available; survey to produce maps of cassava processing location as guide on peel availability to potential investors is planned)
- Providing facilities for training, guiding start-ups and potential forward linkage effects of double that amount
- Depending on drying method (sunshine, toasting, flash-drying), production costs vary from $70 to $80/t
- Primary products of this innovation are worth US$2 billion annually to Africa with potential forward linkage effects of double that amount

Partnerships

Public sector partners: to provide favourable business environment e.g. product quality assurance, policies on solid waste management, supporting awareness creation are: Federal Ministry of Agriculture and Rural Development (FMARD), Raw Materials Research and Development Council (RMRDC), National Office for Technology Acquisition and Promotion (NOTAP)

Private sector partners: See bottom strip

Research partners for product improvement and commerce:
- CIAT – improving drying efficiency
- IITA (ICT) – developing Cassava Peel Tracker® application

Financial sustainability

- The raw material is virtually free as about 98% of peels are dumped
- Depending on drying method (sunshine, toasting, flash-drying), production costs vary from $70 to $80/t
- Earmark US$1.8 billion annually to a industry in the cassava value chain (that employs 500,000 persons annually, 80% women); reduce competition between animal and human for cereals (releasing eight million tons of cereals from livestock industry;)
- Cassava is a zero-waste crop