

# **Project Title: Development of Enterprise in Solar Drying of Fruit and Vegetables for Employment Creation**

## **Executive summary**

The main objective of this action research project was, on a pilot basis, to establish an enterprise within food processing industry (solar drying of fruit and vegetable) and thus lay the foundation for youths to engage in small-scale processing enterprises for employment creation. This was to be achieved through the development of appropriate and affordable technologies for processing fruit and vegetable so as to add value and extend the shelf life. The action research project included a critical analysis of fruit and vegetable marketing chain and assessment of food quality control in processing to come up with a proven intervention geared towards facilitating farmers. The target technology was solar dehydration since solar dryers are considered to be simple and much cheaper than most of food drying technologies; once learned, it is possible for a low-resource entrepreneur to invest in. However the project surveyed the market and selected three types of driers to be tested: traditional wooden dryers, Hohenheim solar tunnel and electrical cabinet dryers. We envisage that a good dryer will be proven to be good in rapid, consistent drying and more effective at preserving the nutritional quality of foods compared to traditional sun drying, but also cost effective.

It was envisage that proposed research will fill the knowledge and information gap of how to create successful entrepreneurs in agribusiness value chain using appropriate technologies and scientific processes; provide a demonstration of a research-based enterprise development concept. It was a proof of concept or action research project. Capacity building was focus on 2 PhD level training, one in business management/economics and another in food science and technology and research support of 2 Msc students. This is project was developed in collaboration between Sokoine University of Agriculture (Tanzania), Aalborg University (Denmark) and Danish Technological Institute (Denmark). However, due to re-organization of DTI and associated staff movements, DTI dropped out of the collaboration.

Action research methodology was used. The project concluded that there is a need to bring “research activities closer to development” and “development activities close the research” as much as possible. In fact the two need to be connected in action for the learning to be fed into development intervention continuously. Action research method is most effective approach and if utilized, development outcomes can most likely be attained.

## **Introduction**

The overall objective of the project was to generate knowledge through action research using a pilot project and study that will support establishment of a viable enterprise in drying fruits and vegetables using solar dryers. This overall objective was to fill the knowledge gap on how to generate successful entrepreneurs in the agricultural sector, using appropriate technologies and scientific procedures. Specific objectives were:

1. To identify appropriate solar food-drying technology for fruits and vegetables

2. To generate scientific information from food science and food technology studies as a support service for establishment of viable SME.
3. To generate business information based on well-formulated business studies that aims at providing required information for efficient and effective procurement of raw materials and selling of processed products for successful establishment of the targeted SME.
4. To develop more understanding of the challenges facing entrepreneurs in establishing food processing enterprises in Tanzania
5. To build capacity of SUA in undertaking research in business management and food science and technology disciplines.
6. To enrich SUA Curriculum in business management with practical application in food science and processing technology.

Thus, the overall objective of the action research project was to combine multiple sets of data and information into a coherent framework for the establishing of food processing enterprises for employment generation.

### **Methodology**

The approach was through a pilot action research project to develop practices and underpinning theories for food chain management specifically of dried fruit and vegetable in a Tanzanian context. It involved reviewing real experiences from other countries and combining these experiences with the proposed research to form a conceptual framework for the project. This in turn was then used as a foundation for market, technology and laboratory studies. The linkages to the value chain for raw materials supply and acceptability of dried products by consumers were observed. Research recommendations particularly in economics, business, and marketing of new product, product standards and entry to domestic and global markets were used to direct actions on the ground.

Several academic disciplines were brought together. These include enterprise development (entrepreneurship), food drying technology, food science and nutrition, consumer acceptability, processing and quality control and development of a value chain and more specifically the fruits and vegetables value chain development in Tanzania.

### **Results**

The project format was highly challenging to an academics because most activities were to be done based on action approach that require having something on the ground that are first created by the researcher themselves. It also involved experts specialized in various disciplines, potential entrepreneurs who are searching of whom they are and what they can do for their living. For project leader this was not an easy team to lead. The project managed to:

1. Strengthened collaboration with AAU for research and PhD training. With this collaboration we participated as a team in BSU 1 activities.
2. Facilities for solar drying of fruit and vegetable were established to cater for students and potential entrepreneurs. Entrepreneurship research group was initiated. The team participated in other related projects.
3. Links to the stakeholders of the industry continued and new stakeholders identified. Regional stakeholders network was initiated.

4. Through distribution and retailing activities of the dried project. We managed to distribute products to supermarket in Morogoro, Dar-es-Salaam and Arusha.
5. We successfully participated in outreach programs using our developed products at DANIDA pilot project, also accommodating SUGECO entrepreneurs.
6. Our entrepreneurs participated in national and regional programs in Nairobi, Kampala and Dar-es-salaam.
7. Two SUA staffs were trained to the levels of PhDs. Both have graduated and returned to SUA as academic member of staff. One Msc students was supported for her research on fresh fruit marketing in Tanzania. She graduated and now she if employed by Mt. Meru University in Arusha, Tanzania
8. Business incubator continues to operate under the management of research team, producing and developing new products, improve packaging and retailing. This has allowed students to embark on research activities using the pilot facilities. Product developed lab is now equipped for further product development in the food sector. The project published 10 different kinds of publications journals, proceedings and chapter in a book. It also wrote a winning proposal “Growing Innovative Entrepreneurs in Agribusiness Value Chain in Tanzania” that is on going funded by DANIDA-Southern program.

### **Implications**

The project was a proof of concept that used action research for development. It managed to demonstrate potentials, challenges and solutions to agribusiness value chain development in Tanzania while, attracting youth and graduates to the agribusiness sector. This project can be used to promote the research approaches that are directly feeding to development and enterprise support programs, which are important in ensuring sustainable outreach in the agricultural sector.

### **Recommendations**

At present most development and research activities are conducted without required close linkages. There is a need to bring “research activities closer to development” and “development activities close the research” as much as possible. With the available capacities and good orientation to science that is available in Universities and other research centers, the project has demonstrated that development impact can be much more effectively realized if research project methodologies are used to target particular development outcomes more directly. This project demonstrated that this could be done through subjecting to test recommendations from previous researches, various knowledge bases available, which are often used in training as well as in planning for development interventions. Such test will allow context specific recommendations for more effective and efficient development interventions.