


Chinoje Nutrition Business Center (CNBC) as example for improved market access in rural Tanzanian farming communities

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Summary

This factsheet presents a scalable and learning model demonstrating how rural agri-business can deliver rural nutrition through improved processing and trade of indigenous vegetables and grain legumes. The agribusiness center is designed to be operated with a local social entrepreneur managing the facility.

Objective

The CNBC aims to demonstrate how rural agri-business can deliver nutritious foods in a sustainable manner. The center also integrates a) improved solar drying and b) trading of indigenous leafy vegetables and associated products. In addition, the center provides physical space for nutrition education.

Key Lessons Learned

As implementation is still ongoing, most lessons are those gained during the construction and procurement of improved solar dryers from other development partners:

- the idea of the center was well received by the village government as a market based solution for stable access to nutrient-dense foods
- the idea of social entrepreneurship is new to rural food related SMEs, more training and orientation for rural entrepreneur is critical
- partnerships and networking with other R&D partners is critical as it enabled receiving improved solar dryers for free from the Centre for Agricultural Mechanization and Rural Technology (CARMATEC), based in Arusha.

Constraints & Objectives Addressed

The following issues were observed while the center was being established:

- Delivery of construction material was challenging due to poor road and water scarcity.
- Potential social entrepreneurs were not readily willing to contribute capital for investment mainly due income poverty and one who contributed claimed it back when he had a money problem.
- The center could not start before a clear agreement between SUA, the local government and the social entrepreneur was made.
- Establishing such centers is costly, although the expected local social returns outweigh the costs.

Description of Innovation

The CNBC innovation is designed to contribute to the enhancement of food and nutrition security through food processing and trade. This endeavor entails integrating the processing of nutrient-dense Indigenous Leafy Vegetables (ILVs) using solar driers, vegetables sales outlet, and extension of nutrition education. The CNBC has four rooms – the sales area equipped with display shelves, the storage room, the delivery space, and the training room, which can accommodate up to 10 people at a time.

Through collaboration with CAMARTEC the project received two versions of cabinet solar dryers. One dryer is designed to utilize direct sunlight that heats the glass on top of the cabinet within which the vegetables are dried. The other one utilizes indirect sunlight that

hits a glass cabinet through a drying cabinet that sucks heated air via the drying chambers through the chimney. The technical efficiency and effects on nutrient levels in dried ILVs for the two solar dryers was tested at SUA before transferring them to the village.

The experiment was carried out on sweet potato leaves (*Ipomoea batatas*), which is a common ILV in rural areas. Data for both engineering efficiency and nutritional effects are being analyzed. The center will be owned by SUA but operated as an ILVs agri-business venture managed through a partnership between a SUA agribusiness graduate and a local social entrepreneur from Chinoje village.

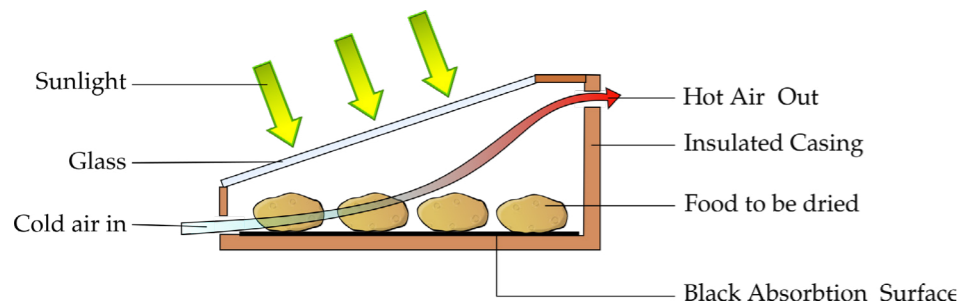


Improved dryers test at SUA before installed in the village

Proven Success in TZ and Beyond

The CNBC innovation in its integral form has never been tested anywhere, but individual solar drying has.

Cabinet solar drying enables farmers to dry their fruits and vegetables. Apart from being hygienic cabinets, solar dryers maintain color, flavor, and micro-nutrients of ILVs.



Considerations & Criteria for Outscaling

The innovation needs substantial investment in the infrastructure and equipment – the building and driers. The investment costs extensively limit the scalability of the innovation in rural settings. Partnerships with AgR4D organizations hosting a stock of technologies are highly recommended. The project benefited from CAMARTEC solar drying technologies in a win-win situation. To ensure sustainability of the center, the institutions with interest must come together with clear ownership and management roles.

SUA will own the center, serving as a rural outreach center for advancing food and nutrition security through trade. A local social entrepreneur will partner with SUA agribusiness graduate to run the center as a business entity but with a social responsibility lens.

Technical & Social Specifications

The CNBC innovation model has never been tested in Sub-Saharan Africa (SSA). However, solar drying technology has been promoted. The use of solar dryer technology seems appropriate for Tanzania because of its abundant sunshine (2800-3500 hours per year) and global radiation of between 4 to 7 kWh/m²/day.

The dryers consist of flat plate solar collector, a drying chamber with crop trays, and a natural ventilation system. The dryers have a maximum collector area of 2.2 m² respectively. Four crop trays with an effective area of 0.57 × 1.03 m² and 0.5 × 1.05 m². Each dryer will hold 10 kg of fresh local leafy vegetables.

With the direct solar drier, the vegetables in drying chamber have to be exposed to direct sun-rays and hot air from the separate collection chamber. With indirect solar dryer, the vegetables in drying chamber receive the stream of hot air from the separate solar collection chamber passing through to the chimney causing a drying effect.



Indirect improved solar dryer



The centre's building with solar dryers



Lessons Learned

One lesson learned at this stage is that local youth showed interest of running the center as a group, but they lacked interest when asked to contribute capital investment. One youth who seemed to be committed with interest in the idea contributed Tsh 100,000.00 to finance the construction but claimed back his money later. As the idea has turned to be a reality, we hope the project will manage to find a local young social entrepreneur to partner with the SUA graduate to run the CNBC venture.



Scientific References

Alonge, A. F. (2008): Food Processing Automation Conference Proceedings, 28-29 June 2008, Providence, Rhode Island 701P0508cd. doi:10.13031/2013.24549

Mulokozi, G.; Mselle, L.; Mgoba, G.; Mugyabuso, J.K.L and Ndossi, G.D. (2000): Improved Solar Drying of Vitamin A-rich Foods by Women's Groups in the Singida District of Tanzania. International Center for Research on Women. ICRW/OMNI Report series. <https://www.icrw.org/wp-content/uploads/2016/10/Improved-Solar-Drying-of-Vitamin-A-rich-Foods-by-Womens-Groups-in-the-Singida-District-of-Tanzania.pdf> (last access: 20.11.2018)

Morland, K.; Wing, S. and Diez-Roux, A. (2002): The Contextual Effect of the Local Food Environment on Residents Diets: The Atherosclerosis Risk in Communities Study. American Journal of Public Health, 92(11):1761-1767, 2002. <http://ajph.aphapublications.org/doi/pdf/10.2105/AJPH.92.11.1761> (last access: 20.11.2018)

Further Reading & Websites

- USAID (2016): Solar dryers save time, increase income for Afghan farmers. <https://www.usaid.gov/results-data/success-stories/a-supercharge-from-the-sun> (last access: 20.11.2018)



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