



Tropentag, September 14-16, 2022, hybrid conference

“Can agroecological farming feed the world?
Farmers’ and academia’s views”

Solar food processing - ice production and drying - in an off-grid system in Kenya

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Abstract

In coastal Kenya, lack of cold storage facilities and appropriate technologies result in huge losses for coastal fishermen as they transport fish to markets for sell and processing. Consequently, they are forced to sell their produce fresh, to dealers or at uneconomical prices. The warm weather in the region also hastens spoilage of fish leading to cases of post-harvest losses. It is also normally difficult to dry fish during the rainy season and at night. Sun drying on open grounds is prone to contamination and produce poor quality fish that cannot gain access to high value markets.

The public funded project SolCoolDry aims to support the fisherman by the development and set-up of a 100 % solar powered, off-grid system for the production of ice and drying of fish. The system is expected to produce 500 kg of ice and dry 500 kg of fish daily. The PV-electric operation of the flake ice machine in combination with adapted storage technology ensures optimal utilisation of the daily production capacity with an optimised plant operation. Furthermore, the solar thermal system is designed to provide a 24-hour operation of the solar tunnel dryer. Degradation processes of the material to be dried during the night hours can therewith be avoided. The system consists of a sea container with inverters as well as electric and thermal storages shaded by a roof of PV-modules and solar thermal collectors. Next to it, the solar tunnel dryer has been set up. A monitoring system allows the partners to keep an eye from remote at the operation behaviour and to support the local operators.

To guarantee a successful set up of the “whole containerized package” sent to the partners in Kenya, a video tutorial was created due to the restrictions caused by the Corona pandemic. Finally, the system was being assembled at the Mwazaro site (at the south coast of Kenya) by the local partners. The video tutorial as assembly instruction was extremely advantageous. The partners also kept a weekly updates online meetings to monitor the progress of delivery and installation of the SolCoolDry system.

Fish farmers will be trained on processing and quality assurance. Fraunhofer ISE and Innotech is partnering with Kenya Industrial Research and Development Institute (KIRDI), Kenya Marine and Fisheries Research Institute (KMFRI) and Technical University of Mombasa (TUM) to transfer the proposed technology package. With the help of these activities, a sustainable operation of the SolCoolDry-system will be supported.

In the presentation we will give a short overview of the project with focus on the commissioning and first results of the system operation in summer 2022.

The project is supported by funds of the Federal Ministry of Food and Agriculture (BMEL) based on a decision of the Parliament of the Federal Republic of Germany via the Federal Office for Agriculture and Food (BLE).

Keywords: Ice production, drying, food processing, off grid, solar