



## Project update

<b>Project title (Acronym):</b>	<b>Development of Milkfish (<i>Chanos chanos</i>) and Kimarawali (<i>Stolephorus delectatus</i>) Solar Drying-Cooling Technology, Value Addition and Quality Assurance</b>
Geographical focus:	Kenya/Coast/tbd
Call reference:	"Innovative approaches to process local food in Sub-Saharan Africa and Southeast Asia" (Bekanntmachung des BMEL: Innovative Ansätze zur Verarbeitung lokaler Lebensmittel in Subsahara-Afrika und Südostasien)
Cooperating partners:	Fraunhofer Institut für Solare Energiesysteme ISE Innotech Ingenieursgesellschaft mbH Kenya Industrial Research and Development Institute KIRDI Kenya Marine and Fisheries Research Institute KMFRI Technical University of Mombasa TUM
Duration:	09/2018 - 03/2022
Budget:	1000709,70 €



### Map of the target region

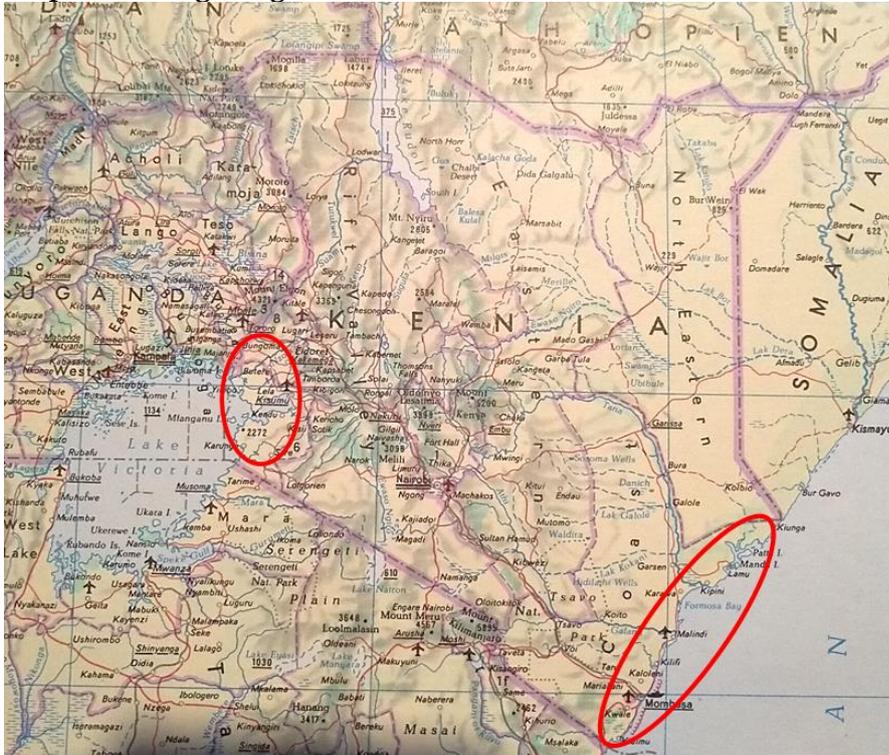


Fig. 1: Map of the target region in Kenya (Source: Haack Weltatlas, VEB Hermann Haack, Geographisch-Kartographische Anstalt, Gotha/Leipzig, 1972, 1. Auflage)

### Aim of the project:

The aim of the project is the development of a 100% solar powered, off-grid system for the production of ice and the drying of fish. On the one hand, with the provision of ice for cooling during transport or temporary storage on the way between catching and processing or sale, and on the other hand with the drying capacity, two essential aspects for ensuring the preservation of fish are addressed.

The PV-electric operation of the flake ice machine in combination with adapted storage technology ensures optimal utilization of the daily production capacity with optimized plant operation. With the help of a solar thermal system, which is combined with the solar tunnel dryer, 24-hour operation is possible. Degradation processes of the material to be dried during the night hours can therewith be avoided. To produce high quality dried fish (premium nutritional value, texture and flavour), dehydration will be done through optimised control of temperature and humidity. Fish farmers will be trained on processing and quality assurance. Fraunhofer ISE and Innotech will partner with Kenya Industrial Research and Development Institute (KIRDI), Kenya Marine and Fisheries Research Institute (KMFRI) and Technical University of Mombasa (TUM) to design, develop and transfer the proposed technology package.

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**Results:**

Based on the findings of the on-site analysis and supported by the results of the baseline survey, the system concept was adapted to produce ice instead of the originally planned cold storage. This led to a higher energy requirement to be covered. By means of simulation calculations, the system was designed and optimised taking into account climatic, technical and financial boundary conditions. At the same time, a double-deck dryer was developed, which, as already mentioned above, additionally enables continued operation during night hours. The Kenyan partners carried out a further analysis of the situation on site in order to be able to select the site for the installation of the first pilot system.

**Key statements and policy advice:**

Reduction of post harvest losses by preservation technologies and accompanying measures for education are important issues.

**Pictures**

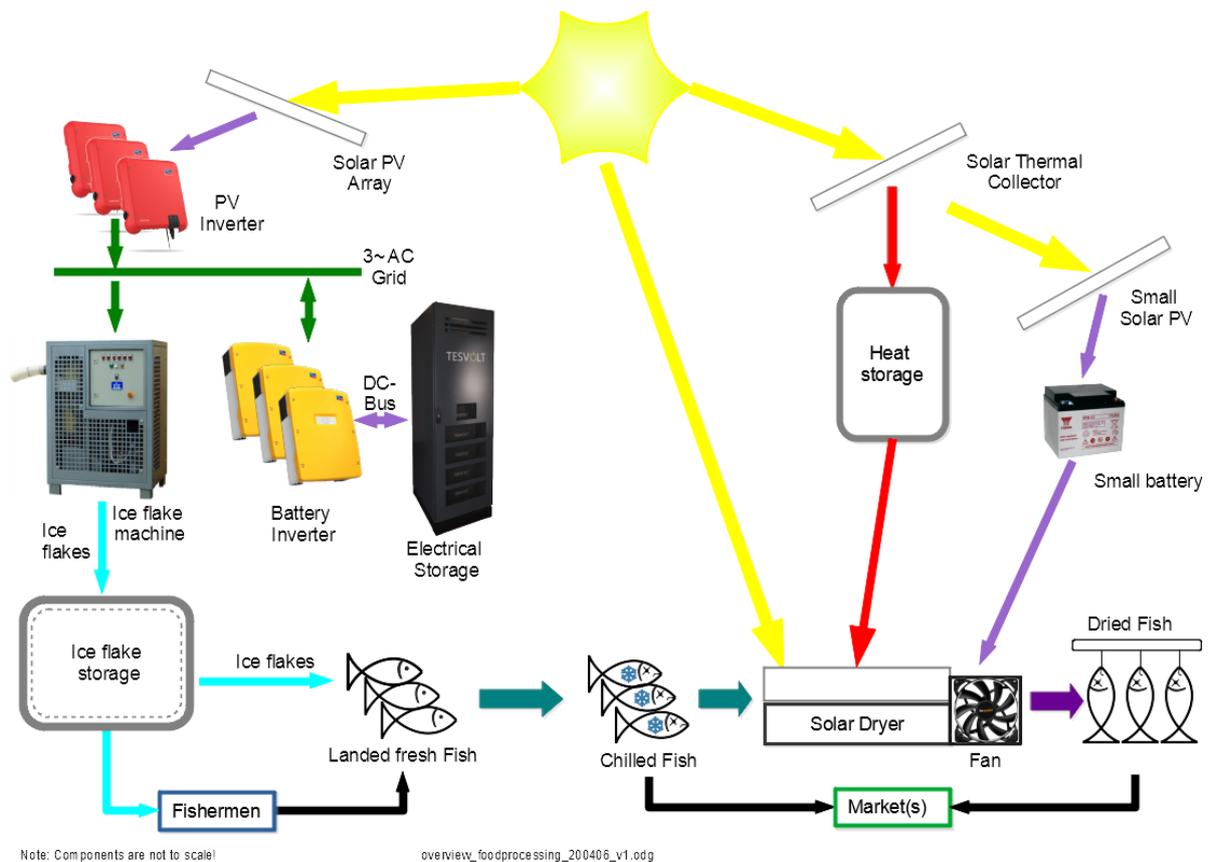


Fig. 2: System concept (simplified version)

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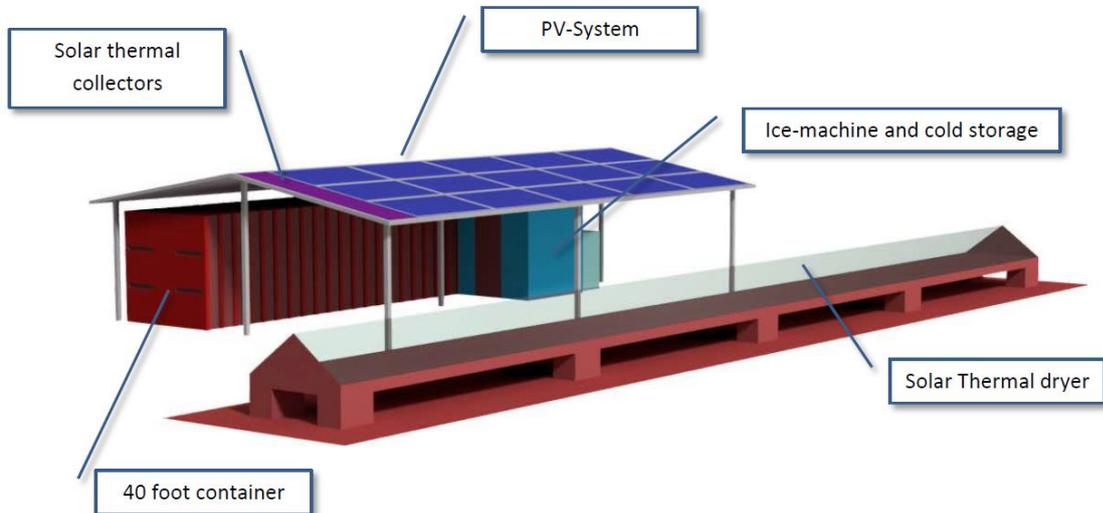


Fig. 3: Installation planning with photovoltaic system, solar collectors, 40-foot container, ice machine and small cold storage room for the flake ice as well as solar thermal dryer