

## Project fact sheet

Geographical focus:	Malawi
Call reference:	“Forschungskooperationen zu Welternährung” Research cooperation for global food security
Project title:	Improving Community Health-Nutrition Linkages through Solar Energy Based Fish and Crop Integrated Value Chains- ICH LIEBE FISCH
Cooperating partners:	<ol style="list-style-type: none"> <li>1. Fraunhofer Research Institution for Marine Biotechnology and Cell Technology (EMB)</li> <li>2. Association for marine aquaculture mbH (GMA)</li> <li>3. Lilongwe University of Agriculture &amp; Natural Resources, Aquaculture and Fisheries Science Department (LUANAR-AQF)</li> <li>4. Lilongwe University of Agriculture &amp; Natural Resources, Department of Human Nutrition and Health (LUANAR-HNH)</li> <li>5. Lilongwe University of Agriculture &amp; Natural Resources, Department of Food Science and Technology (LUANAR-FST)</li> <li>6. Quantum for Urban Agriculture and Environmental Sanitation (QUALIVES)</li> <li>7. Innovative Fish Farmers Network Trust (IFFNT)</li> </ol>
Duration:	1 <sup>st</sup> March 2016 – 30 <sup>th</sup> September 2019
Budget:	1.265.641,50 €



## Aim of the project:

The project "Ich liebe Fisch" focuses on research and linking of several aspects along the value chain of sustainable aquaculture of the endemic fish species *Oreochromis karongae* ("Chambo"), a favored and high quality source of protein for human nutrition in Malawi. In the context of this focus, integrated agriculture-aquaculture (IAA) systems will be established as an environmentally sustainable approach and ecological alternative to classical agriculture for production of healthy and diversified groceries. IAA or Aquaponic systems are aquatic agriculture systems that combine fish farming with growing of crops in a synergistic manner, utilizing small surface areas as crops can be grown floating on fish ponds and with minimum risk of environmental pollution owing to its integral biofiltration. The major input of organic matter is fish feed, which is being assimilated into fish protein and, through the faeces of the fish, into highly bioavailable organic fertilizers. These systems will allow enhanced productivity, in combining fish and crop production and eventually optimized nutritional and socio-economic status of smallholder farmers in rural areas of Malawi adopting these techniques.

Specifically, the approach of this project is to (a) enhance the production of endemic fish species by breeding and hybridization, (b) establish a specialized solar powered hatchery and optimize rearing protocols of *O. karongae*, in order to improve the sustainable supply of fingerlings for ongrowing farms, (c) use an IAA system approach to integrate nutrient fluxes between animal and crop production, (d) implement training courses for local communities and smallholder farmers, thus ensuring capacity development and (e) monitor the changes in health status and food habits of local families and especially children and elderly people after implementation of the IAA system to ensure a benefit for the whole community and (f) facilitate establishment of a community agriculture-nutrition-health linkage innovation platform and networking with relevant institutions to safeguard sustainability beyond the project life cycle.

## Results (please insert 2-3 photos (jpeg)):

A kick-off meeting to discuss the detailed agenda of the project "Ich liebe Fisch" was held with the leader of participating partners in Lilongwe, Malawi, from 18<sup>th</sup> to 24<sup>th</sup> July 2016. During this meeting, the German partners from EMB and GMA were visiting the campus of LUANAR and the aquaculture facilities of the Bunda College. Additionally, a typical community with fish farmers near Lilongwe already applying IAA was visited, which is supposed to act as template for the communities which will participate in the project.

Fig. 1: Visiting of sites. a) German project partners visited a farmer already practicing IAA in a community near



Lilongwe. b) Field trip to Mchinji district and inspection of ponds in the area.

At the beginning of the project, two field trips to the districts of Nkhosha and Mchinji were organized and potential communities of innovative fish farmers were identified and informed about the aim of the project and the possibilities to participate. Two communities were selected as beneficiary communities and two other communities in the same district but spatially apart were selected as control groups. A baseline survey was conducted in order

to assess the current fish farming practices as well as the health and nutritional status of the selected communities (especially children). The collected data will form the basis for measuring changes after project implementation. In Mchinji, a total of 98 fish farming households were randomly sampled as the intervention group and 101 households were sampled to form the control group. In Nkhotakota 88 households and 99 households were sampled as intervention and control groups, respectively. Respondents were largely females (69%) living in households headed by males. The sampled population was fairly young (Mean/median age of 19), with a household size ranging mostly from 5 to 9 members in both districts. Farming was quoted as the main source of income in both intervention and control groups (about 72%) in both districts. Fish production is mainly organized in clubs (jointly owning several ponds) in both Mchinji and Nkhotakota as less than 3% of the farmers own personal ponds. In conclusion, it can be noted, that the current fish production is low and the extent of integration with agriculture is not very advanced nor coordinated. *T. rendalli* (Chilunguni), *O. Karongae* (Chambo) and *O. Shiranus* (Makumba) are the most widely kept species.

Food insecurity was severe in both Mchinji and Nkhotakota districts with more households in Nkhotakota reporting severe food insecurity, which generally had poorer indicators than Mchinji. Concerning children's health, it can be stated that there were more stunted children in Mchinji than in Nkhotakota (34.1% vs. 30.3%). However, prevalence of stunting is lower in these districts than the national prevalence of 37% according to the most recent 2015 Malawi Demographic and Health Surveys.

In order to enhance the yield and the efficiency in production of endemic fish species about 1000 brooders of each *O. karonage*, *O. shiranus* and *O. mossambicus* were collected from different water bodies in Malawi and brought to the newly renovated ponds of LUANAR. This pool of adult fishes will be used in experiments in order to classify the genetic resources and to identify the optimal biotic and abiotic conditions for optimized production as well as for the production of fry. Additionally, a solar powered hatchery was designed that will allow larval rearing independently of local energy grids, which will be constructed in Germany this summer before transporting it to Malawi in September 2017.

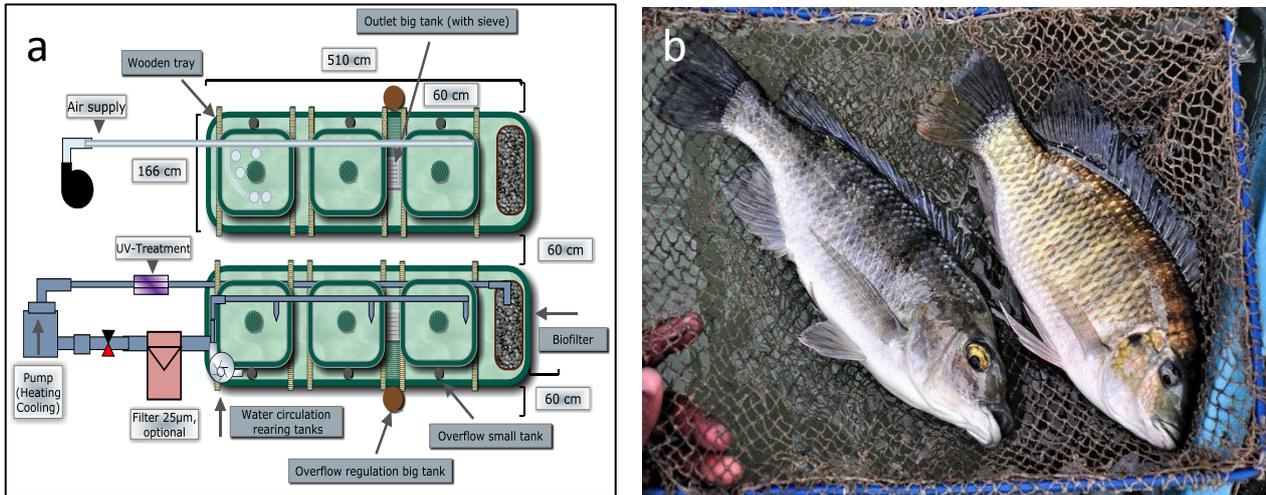


Fig. 2: a) Scheme of the planned hatchery module. b) *O. shiranus* (left) and *O. karongae* (right).

In order to keep the general public, interested scientists and specifically the target communities in Malawi informed, the project will make its results widely available and will ensure dissemination and exploitation of its results. As a first mean to achieve this, a dedicated project website was established, which can be visited for further information ([www.fish-for-life.org](http://www.fish-for-life.org)).