„ICH LIEBE FISCH“- I LOVE FISH

Improving Community Health-Nutrition Linkages through Solar Energy Based Fish and Crop Integrated Value Chains

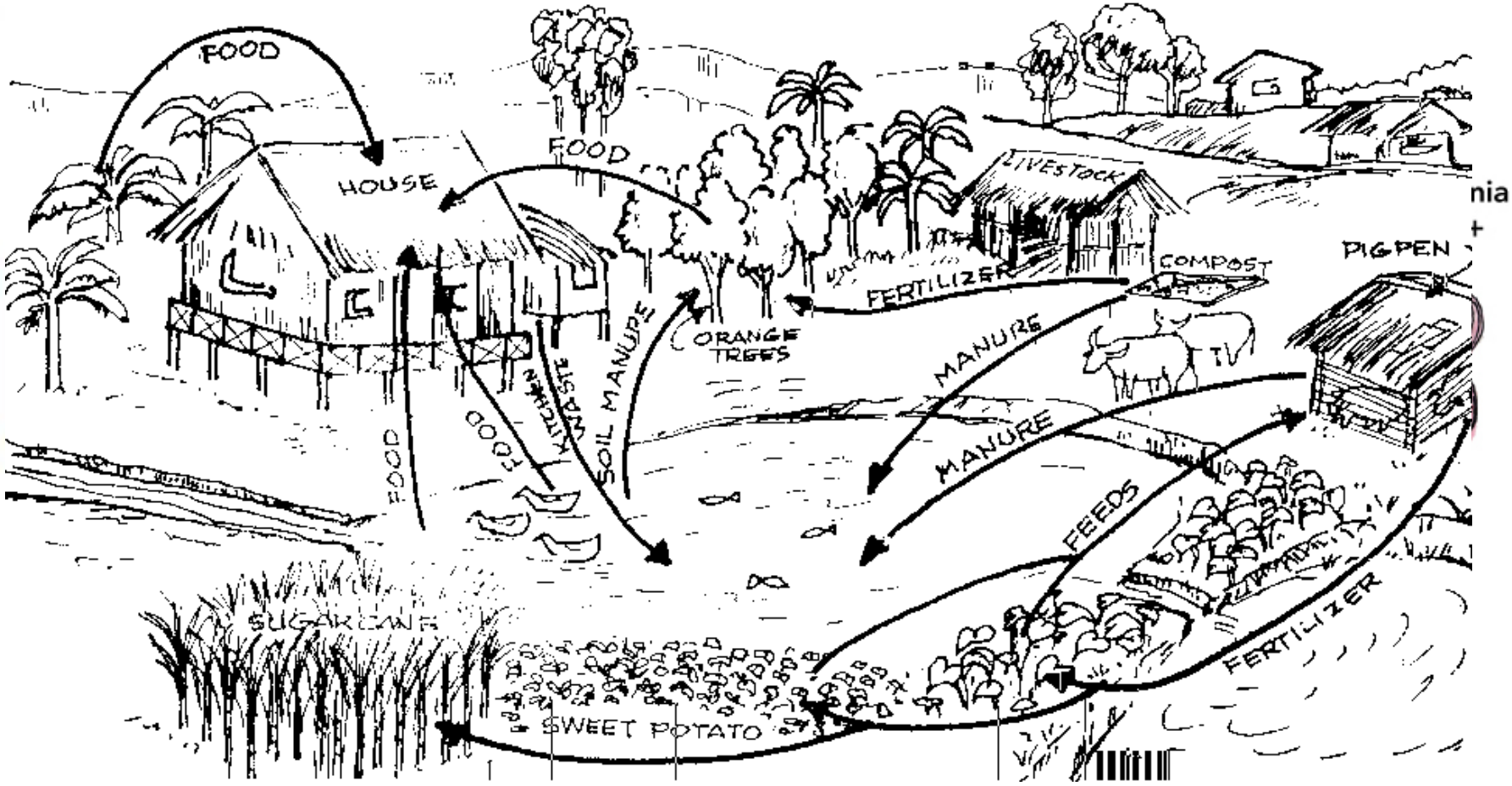
Federal Ministry of Food and Agriculture

LUANAR

GMA Gesellschaft für Marine Aquakultur

Fraunhofer EMB

Introduction to Aquaponics and Integrated Agriculture-Aquaculture (IAA)



http://feelgoodaquaponics.blogspot.de/2012/10/
http://www.tomatenfisch.igb-berlin.de/
http://www.nzdl.org/

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Fishing and Aquaculture in Malawi

- Lake Malawi: 365 mi long and 52 mi wide (“Calendar Lake”), third largest in Africa
- Fish is major food source
- Chambo species being the most popular (*Oreochromis karongae*, *O. lidole*, *O. saka* and *O. squamipinnis*), closely related *O. shiranus*
- *O. karongae*:
  - preferred species
  - low fecundity and low larval survival
  - - 70% in catches over a ten-year period
  - IUCN red listed
  - low fingerling supply to fish farms and thus few aquaculture farms

Foto: © Dekaro - Fotolia.com

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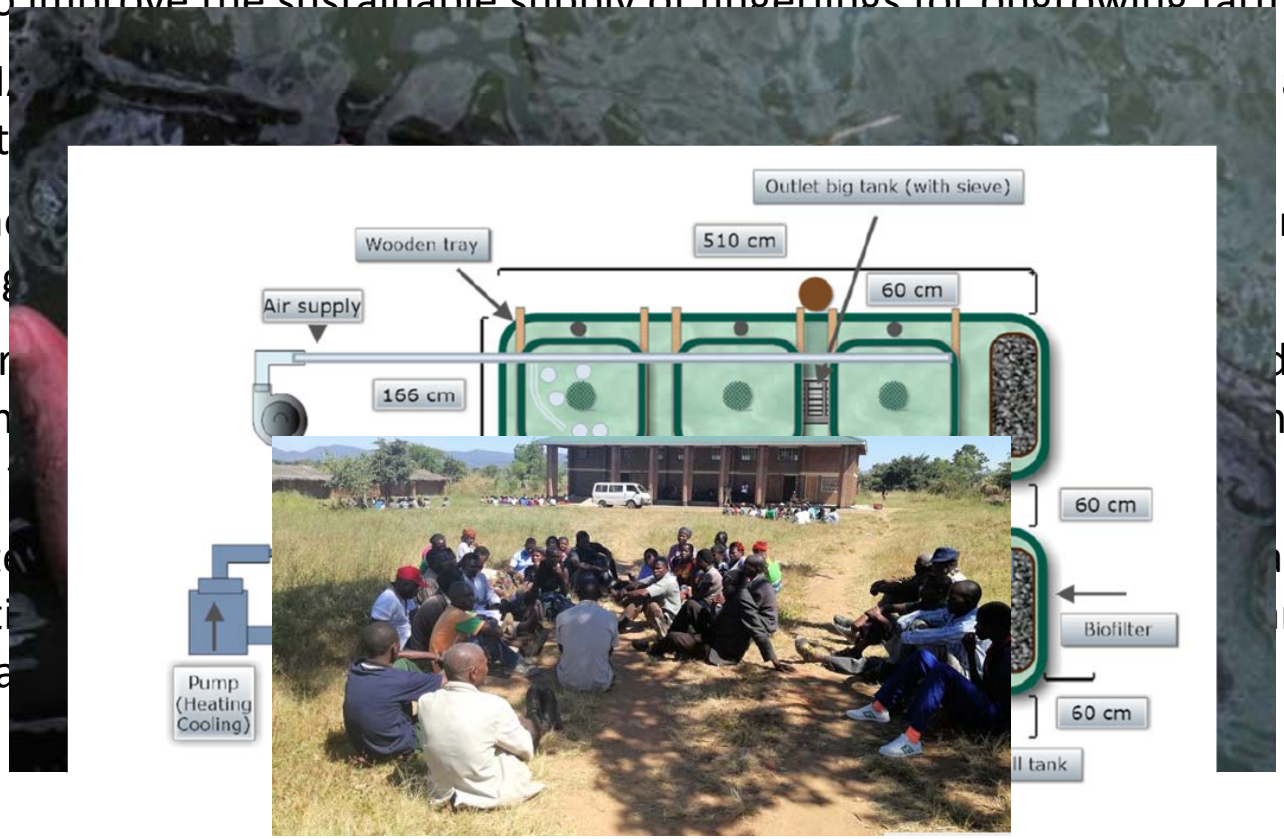
Aim of the project “Ich liebe Fisch”

- enhance the production of endemic fish species by breeding and hybridization
- establish a specialized solar powered hatchery and optimize rearing protocols, in order to improve the sustainable supply of fingerlings for ongrowing farms
- use an I and crop product
- implem rs, thus ensurin
- monitor d especially children nsure a benefit
- facilitat ge innovati rd sustaina



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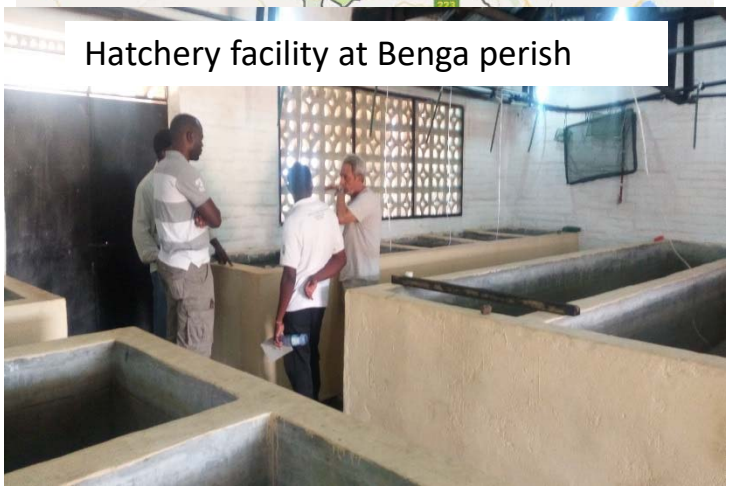
Site selection

- Two geographically and ecologically distinct sites and two villages, respectively, were selected
  - Mchinji: inland site, without connection to lake or river
    - Chisamba- Matidzi village (good water availability, but no fingerlings available)
    - Kawele Village (most lakes were affected by drought)
  - Nkhotakota: site at the Malawi lake
    - Mwansambo village (Water scarcity due to drought)
    - Kachere village (good water availability, at Lake Malawi shore)



Hatchery facility at Benga perish

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Results of the baseline survey

- Intervention group: 98 fish farming households in Mchinji and 88 households in Nkhotakota
- Control group: 101 households in Mchinji, and 99 households in Nkhotakota
- Respondents largely females (69%), households headed by males; Mean/median age: 19
- Land ownership was slightly higher in Mchinji than it was in Nkhotakota in both intervention (94.8% vs.81.8%) and control groups (89.1% vs. 83.8%)
- Fish production: less than 3% personal ponds; mainly through clubs; 8 clubs in Mchinji; 16 clubs in Nkhotakota

Results of the baseline survey

- Most commonly farmed species:
  - Mchinji: *T. rendalli* (Chilunguni) (57.1%), *O. Karongae* (Chambo) (42.9%) and *O. Shiranus* (Makumba) (34.7%)
  - Nkhotakota: *O. Shiranus* (Makumba) (44.3%) and *O. karongae* (25%)
- Food insecurity severe in both Mchinji and Nkhotakota districts
- Mean age for children: 33.6 months (intervention group) vs. 31.4 months (control group)
- Mean weight and height: 86.1cm and 15kg (intervention group) vs. 84.5cm and 14.8kg (control group)
- Stunted children in Mchinji vs. Nkhotakota: 34.1% vs. 30.3%
- Prevalence of stunting lower than the national prevalence of 37% (2015 Malawi Demographic and Health Surveys)

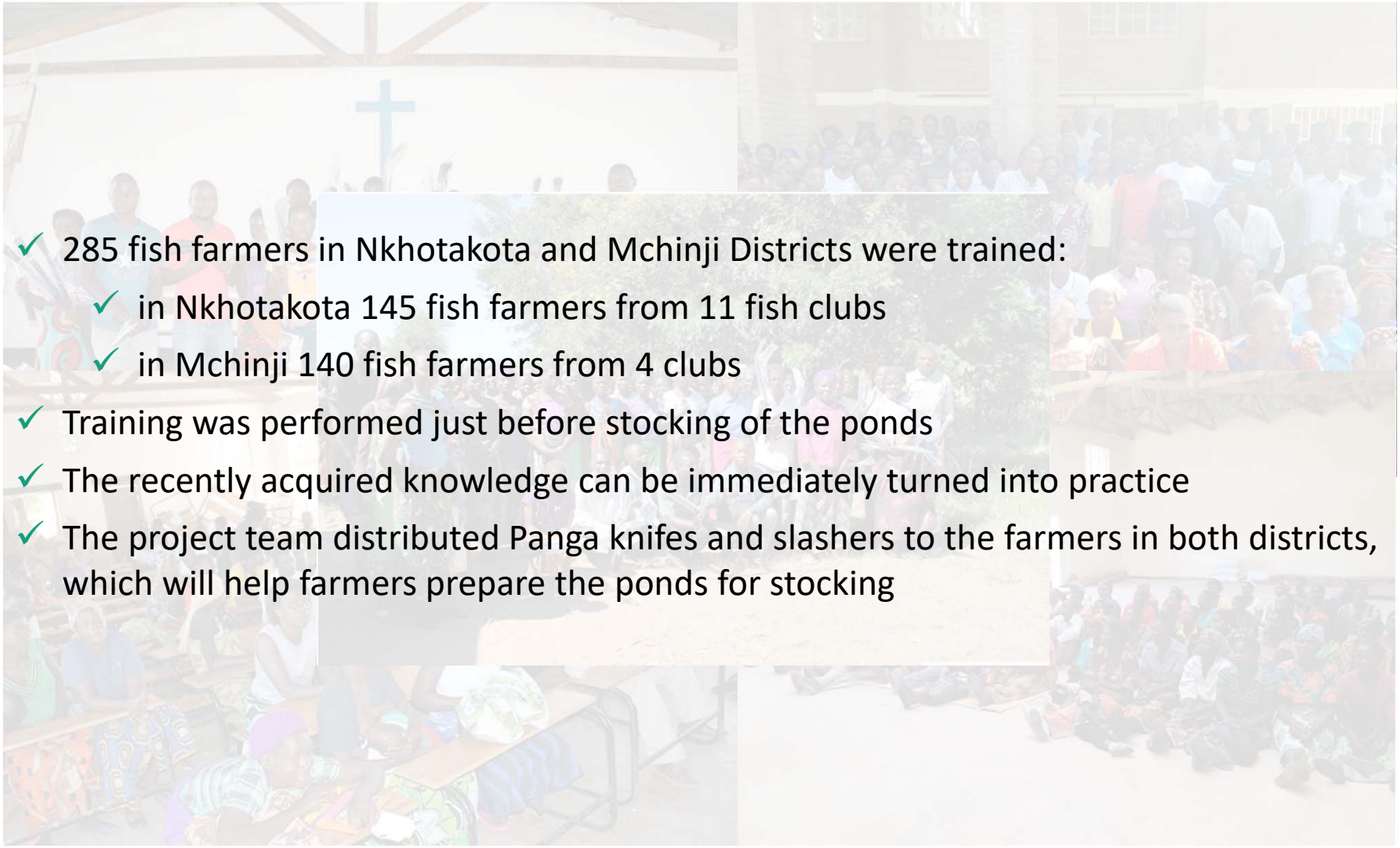
Conclusion

- Current fish production is low and not integrated in both districts. Overall, there is high production of *O. shiranus*, *O. karongae* and *T.rendalli* species. Production in Mchinji is higher than Nkhotakota but value addition is not practiced in either district.
- The results reveal higher morbidity rates and poor diversity in Nkhotakota, which generally had poorer indicators than Mchinji. However, prevalence of undernutrition, particularly stunting, was higher in Mchinji.

Fish collection

- 1000 brooders from O. karongae, O. shiranus and O. mossambicus each were collected and brought to LUANAR
- O. karongae were collected from 5 different locations for later DNA extraction and genetic characterization:
  - Salima, Nhkotakota, Mangochi, Liwonde, Chikwawa
- 200 brooders and 400 fin clips (for DNA extraction) are waiting to be exported to Germany for further experiments

IAA training courses



- ✓ 285 fish farmers in Nkhotakota and Mchinji Districts were trained:
  - ✓ in Nkhotakota 145 fish farmers from 11 fish clubs
  - ✓ in Mchinji 140 fish farmers from 4 clubs
- ✓ Training was performed just before stocking of the ponds
- ✓ The recently acquired knowledge can be immediately turned into practice
- ✓ The project team distributed Panga knifes and slashers to the farmers in both districts, which will help farmers prepare the ponds for stocking

Next steps

- German scientists designed the solar-powered hatchery, which will be shipped to Malawi in October together with equipment needed for the aquaponics units and other experiments
- 3 week stay of German partners in Malawi; construction of hatchery, building of Aquaponics systems in school clubs
- Two Master students from Malawi will come to Germany for a 6 month period and be trained in
  - Genetic characterization of fish specimens
  - Reproduction techniques, including cryopreservation of fish sperm
  - Optimization of rearing of fish fry/larvae and feed composition
- First fingerlings will be distributed to fish farmers during the breeding season (November – March) and IAA will be implemented

The team – THANK YOU

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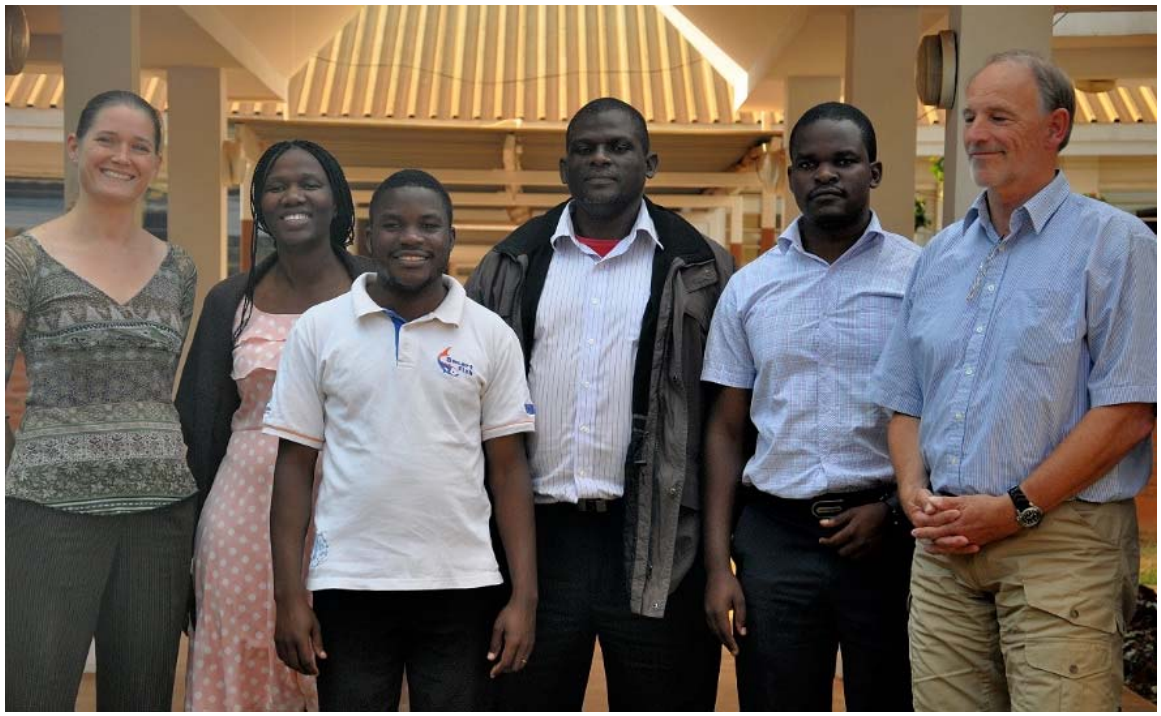

Dr. Joshua Valeta
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Bundesministerium für Ernährung und Landwirtschaft

Bundesanstalt für Landwirtschaft und Ernährung

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