

Rice-Fish farming : an opportunity to fight food insecurity and malnutrition in the highlands of Madagascar

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Madagascar: one of the poorest countries exposed to food and nutrition insecurity

- Rural population with low incomes (average 33\$ per capita per month)
 - Social heterogeneity and strong dependence relationship for land access (sharecropping)
 - Rice is the primary crop food source with low yields due to the lack of organic fertilization
 - Difficulties for cash and food access during the hunger gap
- ⇒ A situation where vulnerable smallholders cannot get out of poverty and food insecurity

The project for Sustainable Aquaculture in Madagascar (Projet Aquaculture Durable à Madagascar -PADM)

This project is part of the special initiative of German Ministry for Cooperation and Development special initiative “One world, No hunger”, implemented by GIZ in collaboration with the ministry of fisheries in Madagascar.

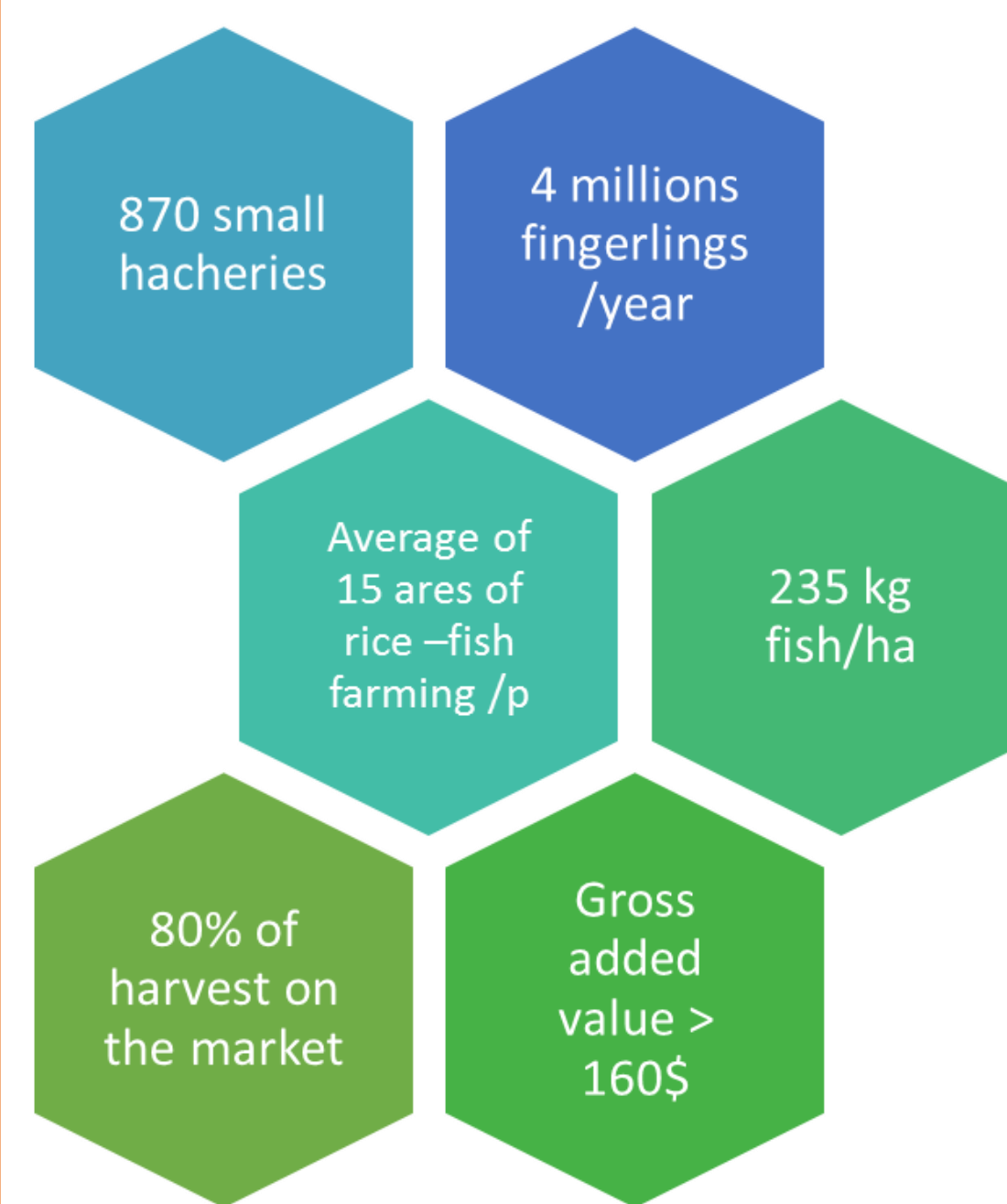
It takes place in central highlands and has 3 components :

- Rice fish farming (APDRA)
- Pond fish farming (COFAD/GOPA)
- Improve framework conditions for sustainable development of the aquaculture sector (GIZ)



Fingerlings cost represents 10% to 25% of farmed fish earning

Rice – carp association: an accessible and agroecological production system for smallholders



Wild fish are traditionally harvested in rice plots. Common carp (*Cyprinus carpio*) finds a good environment for growing under the highlands climate. With few technicality, some farmers can control carp reproduction and sell fingerlings in their neighborhood.

Rice fish farming: an agroecological way of intensification

- Generates new incomes and improves the protein consumption
- Increases rice yield (15-20%)
- Restores soil fertility when practiced during off rice season

Small hatcheries: an alternative way to make fry locally available

- A complementary supply, besides official channels (private operators having taken over from State hatcheries)
 - Cheaper fry, marketable in low quantity
 - An offer available in different seasons and sizes
- ⇒ New distribution and sales networks create new conditions for rice-fish farming development (exchanges of knowledge, sharing technical innovation...)



Some situations to be noticed :

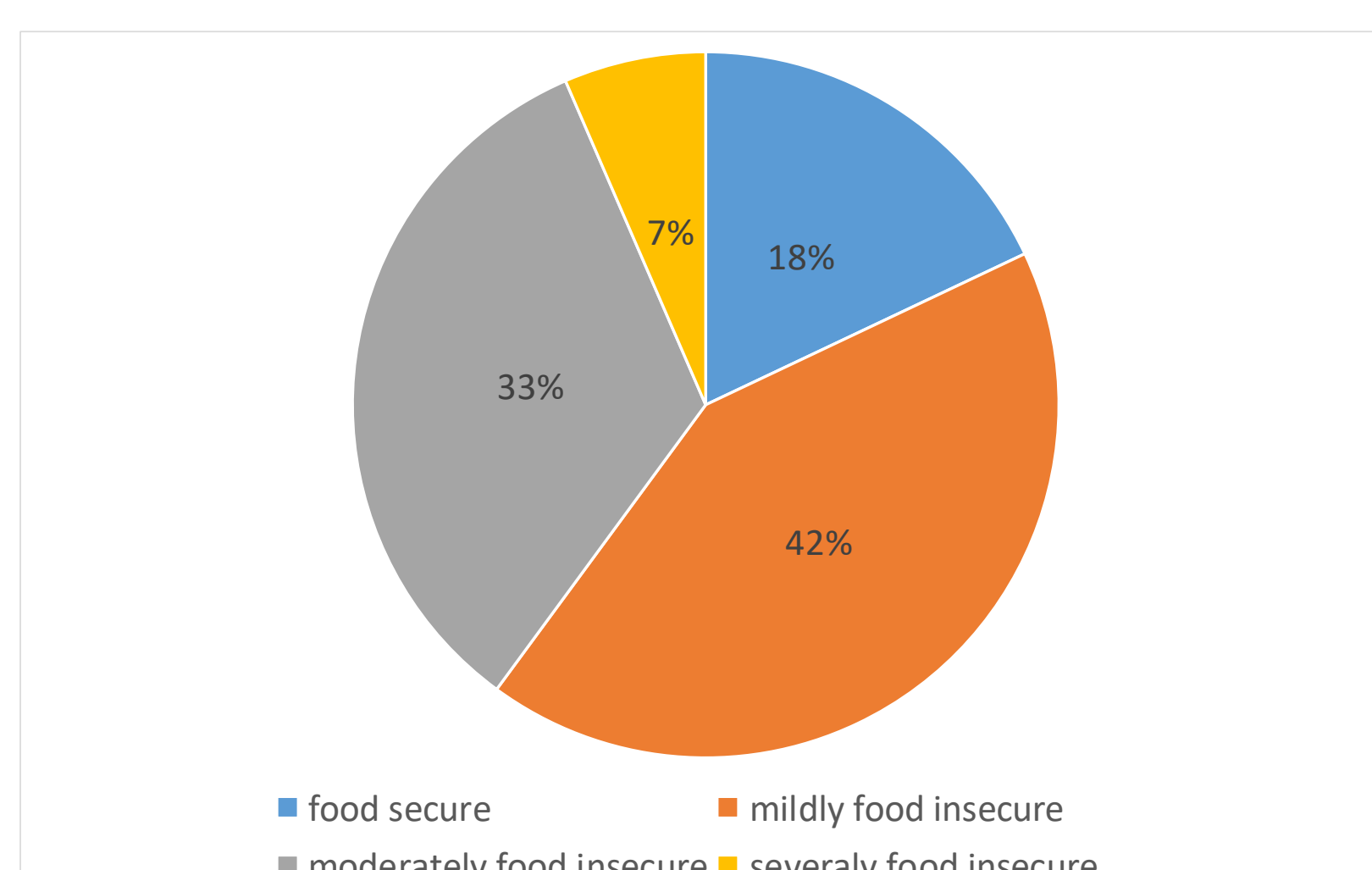
- For farmers unable to pay the fingerlings, new deals are set up with fingerlings paid at the harvest by 30 to 75% of production (a contract that answers the constraints of cash flow during the hunger gap, even if it is not fair).
- Some owners forbid fish farming in rice field. Sometimes, share croppers do fish farming behinds the owner's back.
- Allowing a neighbor to grow carps fingerlings in its rice plots reveals a good deal to ensure a constant irrigation for his rice.

Rice fish farming can diversify and increase incomes of very vulnerable smallholders. It is also a mean to improve water management collectively.

Those paths create an original context where it seems possible to set up new development taking into account barriers for the very vulnerable smallholders (for access to fingerlings, for selling...) and coping with present prescribing rules

New approach for a rice fish farming development more inclusive with food insecure population

According to the baseline survey conducted by GIZ, only 18% of population in the project area is considered food secure (Food Insecurity Experience Scale method, survey based on 1311 persons - sept 2018)



Methodological approach:

- The position of APDRA with a close support in the long term with smallholders constitutes an entry to understand rural social informal dynamics
- Specific participatory approach with poorest farmers will be set up in order to develop a larger impact of rice-fish farming on food insecurity
- New enhancement of rice-fish farming production will be defined considering the specific economic and dependence constraints of vulnerable smallholders

On a technical point of view, fish culture systems have to be revisited by:

- Promoting other species (*Carassius auratus*, *Oreochromis niloticus* / polyculture including wild species)
- Exploring the way of setting up of a collective management of fish resource to get fry access without cash exchanges
- Developing production systems where vulnerable stakeholders will keep control of their management
- Evaluate direct and indirect impacts of rice fish farming with specific benefits for vulnerable smallholders.