

FIBOZOPA Policy brief

Key messages

- In Vietnam fish-borne zoonotic trematodes (FZT) are major parasites of humans. It is estimated that alone in Vietnam 26,366 “disability-adjusted life years” (DALY’s) are lost in Vietnam due to FZT.
- Globally more than 18 million people are infected with FZT.
- Traditional integrated farming systems, where fish ponds are integrated with a combination of horticulture and livestock husbandry are especially at risk for infection with FZT. The systems are referred to as VAC-systems, named after the Vietnamese words for garden (**Vuon**), pond (**Ao**), and livestock housing (**Chuong** for pigsty).
- FZT can be controlled in both intensive and extensive aquaculture systems, through improvement of good hygiene practices at farm level.
- On-farm interventions aimed at prevention of FZT in fish from aquaculture should be part of an integrated more wide focussed farm improvement program and not a stand-alone activity.
- FIBOZOPA is a good example of a One-Health approach to prevent and control an important food safety and human health hazard.
- It is possible to lower FZT infections in fish from aquaculture through implementation of on-farm interventions. Farm management interventions not including drug treatment of humans and animals can be effective and this result have promise for further development of "drug free" interventions.
- The economic aspects of the interventions should be further investigated. Cost-benefit analyses should be carried out to see the real benefits, not only for the farmers, but also in a broader public health context.

Background

Fish-borne zoonotic trematodes (FZT) are a public health concern in Vietnam. In Vietnam and Southeast Asia FZT's are major parasites of humans. Fish from aquaculture is a main source of protein and of great economic importance in both rural and urban areas. Humans and other final hosts acquire these parasites from eating raw or under-cooked fish with FZT metacercariae. Traditionally FZT in humans have been controlled by mass drug treatment, sometimes together with information campaigns about not eating raw or under-cooked fish.

This approach has lowered FZT infections in



Traditional fish pond in a VAC-farming system, Nam Dinh province, Vietnam (Photo: FIBOZOPA project)

humans, but when the drug treatment is stopped, the FZT infections in humans reoccur. Our hypothesis was that through a One-health approach we could combine drug treatment of humans and other reservoir hosts, with snail control and aquaculture management practices to reduce the FZT infections in fish. Previous risk assessment on FZT transmission in the Red River Delta of Vietnam identified carp nursery ponds as major sites of transmission.

The overall objective in FIBOZOPA II was in Vietnam to develop and successfully established an integrated pilot control program of interventions to control fish-borne zoonotic trematodes (FZT) and provide the basis for improved human health.

The project FIBOZOPA

Fish-borne Zoonotic Parasites in Vietnam (FIBOZOPA) is a research and capacity building project supported by Danish International Development Assistance (Danida) and the government of Vietnam. FIBOZOPA has conducted research and capacity building on fish-borne zoonotic parasites in Vietnamese aquaculture from 2004 to 2012. The Department of Veterinary Disease Biology at the Faculty of Health and Medical Sciences at the University of Copenhagen has been the principal responsible partner, and the Research Institute of Aquaculture No 1 in Hanoi, has been the responsible national counterpart in Vietnam.

Besides these two main responsible institutions, a number of core partners have conducted research in the project. They are: the Institute of Ecology and Biological Resources (IEBR), the Vietnam Academy of Science and Technology, Hanoi, Vietnam; the National Institute of Malariology, Parasitology, and Entomology (NIMPE), Hanoi, Vietnam; the National Institute of Veterinary Research (NIVR), Hanoi, Vietnam; the Research Institute of Aquaculture No 2, Ho Chi Minh City (HCMC), Vietnam; and the Research Institute of Aquaculture No 3, Nha Trang, Vietnam.

The main challenges identified before the project implementation were: limited institutional capacity for investigating parasites in cultured fish, primarily fish-borne zoonotic trematodes (FZT) and conducting needed risk assessment on these parasites; lack of baseline information on the prevalence and distribution of FZTs in aquaculture, and limited collaboration among stakeholder institutions.

There were two main phases of the project. In the first phase FIBOZOPA (2004-2009) addressed the main problems identified above by: (A) strengthening of institutional capacities to conduct the risk assessment research needed for control of FZT's in aquaculture; (B) guiding epidemiological research of risk factors related to transmission in aquaculture; (C) developing recommendations for sustainable control measures; and (D) establishing a national institutional network for communicating research, surveillance and sustainable control of FZTs. The main risk factors identified for transmission of FZT in aquaculture relate to FZT egg contamination of the farm environment and the fish pond, and the snail populations in the ponds.

In the second phase of FIBOZOPA (2009-2012), research and pilot trials was designed to mitigate risk factors identified in the first phase of the project. The objective was to successfully establish integrated control of FZTs in selected aquaculture systems. It was shown that improvement of farm

management practices aimed at reducing the risk factors and general improvement of hygiene at the pond level was successful in reducing the infection of FZT in fish from aquaculture. The outcome from this research will aid in the development and establishment of guidelines and strategies for integrated control of FZTs in aquaculture and facilitate the integration of these in national policies in Vietnam.



Picture of intervention pond with cement lined walls, pond is cleared for vegetation and surrounded by a mesh to keep out domestic animals like cats and dogs.

FIBOZOPA is a good example of a One-Health approach to prevent and control an important food safety hazard, in this case fish-borne zoonotic trematodes in products from aquaculture. The multifaceted nature of interventions at pond level required a multidisciplinary research approach that involved both the medical, biological and veterinary technical expertise of the core partners.

Impact and policy changes

- During the full period of FIBOZOPA a total of 7 PhD degrees and 17 Master degrees have been successfully completed, a total of 36 peer-reviewed articles have been published, and numerous presentations to a wide range of stakeholder have been done. The impact of the institutional strengthening have been that the involved research institutions now is a regional "center of excellence" within the field of FZT and the research group might be one of very few research groups having taken a true One-Health approach to combat the problem of FZT globally.

- A pilot intervention program has been developed and it has been shown that interventions are effective in reducing FZT infections in fish from aquaculture.
- Good results have been obtained using Black carp as biological control of snails in fish ponds as a supplement to on-farm interventions.
- Solutions to reduce food safety and public health impacts of of FZT are now on the agenda of the Directorate of Fisheries (D-Fish) in Vietnam. Training material and lectures on FZT have been incorporated in the curricula of Hanoi Agriculture University education on aquaculture.

Further information is available at the FIBOZOPA website: www.ria1.org/fibozopa2/

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