

The Nutritious Pond Project

Newsletter #1

Our Objectives

Our objective is to design a *'nutritious-system'* pond concept that exploits the potential of the pond ecosystem to mineralize wastes and produce natural foods. This innovative feed-the-system concept will be developed in cooperation between industry (Nutreco Netherlands, Skretting-Vietnam and Vemedim Animal Health in Vietnam), universities and research organizations (Wageningen University, Netherlands, Can Tho University, Vietnam and WorldFish) and farmers (represented by My Thanh Shrimp Association, Vietnam). The aim is to make pond farming more sustainable and predictable.

The *'nutritious-system'* concept stimulates microbial mediated mineralization of wastes in the pond and production of high quality natural foods. We aim is to develop novel nutritious-system-feeds that provide for good shrimp nutrition, while simultaneously enhancing natural food production and waste removal. In addition, these feeds are as easy in use as standard shrimp feeds while less costly.

Our Vision



Realizing the *'nutritious-system'* concept requires better understanding of nutrient flows through the pond's food web as a base to formulate *'nutritious-system'* feeds. If successful, nutritious-system-feeds will lower production costs, reduce vulnerability and reduce environmental impacts: it will turn ponds into robust and predictable farming units, even when relying on cheaper inputs.

Project Summary

The project aims to implement a novel *'nutritious-system'* concept in aquaculture, using microbial processes for mineralisation of wastes and the production of high quality natural foods.

Research focuses on generating :

- (1) insight in which factors contribute to the transfer of essential ω 3-PUFAs through the pond food web into fish or shrimp,
- (2) ways to balance the algae (autotrophic):bacteria (heterotrophic) ratio for optimal decomposition, maintenance of water quality and nutritive value of fish or fish shrimp,
- (3) analysing and supporting the process of joint design and technology development.

Project approach



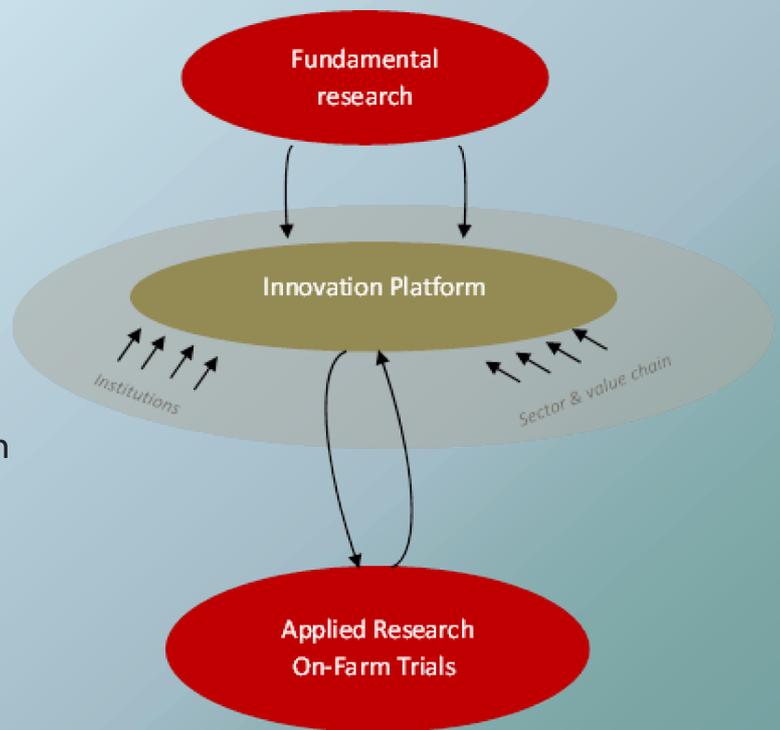
This 4 years research and development project integrates 3 components: i) fundamental research, ii) applied research with on farm trials and iii) interactive design to adapt the new system to local technological, social and institutional context.

Fundamental research will:

- i) Identify nutrient flow bottlenecks within the pond food web, with specific focus on Omega 3 fatty acid, essential to foster natural food in ponds. This research will provide recommendations for nutrient mix.
- ii) Understand mass and stoichiometric balances between autotrophic and heterotrophic processes in ponds, further referred to as algae:bacteria interactions in ponds for the production of high quality natural food.

In addition, **field research** conducted in Bangladesh by Wageningen University and WorldFish on feed composition and food web interactions in semi-intensive shrimp ponds will provide new insights that will contribute to on-farm trials in Vietnam. Findings, from fundamental research and field experiments will be integrated in the formulation of new feeds, that will be tested in Vietnam with farmers.

Because local social and institutional contexts, as well as farmers expertise and needs are key elements of new technology success, results from fundamental and applied research will be shared through an **Innovation Platform** involving partners linked to the project, local extension services, private sector, a farmers' organization representing farmers and other relevant stakeholders. This Innovation Platform will grow and evolve during the project, engaging different stakeholders and discussing results of field trials iterations over a period of 3 years and fine tune product design to facilitate future uptake of the technology by farmers.



The Consortium

Fundamental Research



Aquaculture and Fisheries Group

Innovation System Research



Knowledge, Technology and Innovation Group



Field Research



College of Aquaculture & Fisheries



The People - PhD Students and Postdoc

Devi Hermsen, The Netherlands



Before her enrolment as PhD-candidate, Devi obtained two Master degrees in Biology and in Animal Nutrition at the Wageningen University and worked for two years in the animal feed additive industry as global product manager. In her current fulltime position at the research group of Aquaculture and Fisheries, Devi focuses on managing in situ production of highly unsaturated fatty acids in aquatic systems.

The specific objectives of this PhD project are i) to verify hypothesized bottlenecks for essential ω 3 fatty acid production and transfer in shrimp ponds; and ii) develop a novel formulated nutritious-pond system shrimp feed, enhancing the contribution of natural food in the pond to the shrimp diet with special focus on in situ produced ω 3 fatty acids.

In the coming 6 months, Devi will :

- Perform the first experiment: how does inclusion of essential fatty acids in shrimp feed affects the natural food community and essential fatty acid distribution in shrimp ponds.
- Perform the second experiment: how does altering ratios between carbon, nitrogen and phosphorous in shrimp feed alters the production and transfer of essential fatty acids in the natural food web in shrimp ponds.
- Results from those experiments will inform field trials

More here: [Devi Hermsen](#)

Kabir Ahmed Kazi, Bangladesh



Kazi Ahmed Kabir is a PhD fellow from Bangladesh. His PhD is shared between Wageningen University and WorldFish. He has more than seven years working experience in aquaculture and natural resource management in both academic and development sector, focussing on improving coastal aquatic agricultural system productivity through ecologically sustainable and socially accepted approach.

His PhD research will i) investigate the contribution of formulated feed to shrimp production in different culture systems; ii) understand the indirect impact of formulated feed on shrimp production through the natural food web in different levels of culture intensity. Findings from this research will ultimately aim at improving feed formulation for valorising the contribution of natural foods to shrimp production in semi-intensive ponds.

In the coming 6 months, Kabir will:

- Analyse results of first on farm experiments looking at different C and N ratio in feed and its effect on natural food and directly consumed formulated feed to shrimp production;
- Perform a second experiment investigating the influence of fat and carbohydrates of the diet on faecal waste production and benthic route

More here: [Kabir Ahmed Kazi](#)

Tran Huu Tinh, Vietnam

Tinh is a PhD candidate in Wageningen University. Before being involved in the Nutritious pond project, Tinh obtained a Master of Science in Veterinary Pathobiology in Thailand, working on bacterial disease and antibiotics in shrimp culture and a Bachelor degree from Can Tho University (Vietnam).



His research will focus on understanding the interactions of algae and bacteria in order to find ways to balance their ratio for optimal biological processes in aquaculture environment. Ultimately this research will provide recommendations for fish and shrimp diet composition.

In the coming 6 months, Tinh will:

- Formulate his PhD proposal and design the experimental protocols
- Prepare field experiments in Vietnam

Olivier Joffre, France

Olivier is a postdoc researcher looking at innovation processes. Olivier will support the development and functioning of the innovation platform. He recently defended his PhD on shrimp aquaculture development in the Mekong Delta, at Wageningen University. He worked and lived in the Mekong Region for the last 10 years, doing research on aquaculture and fisheries management. His past experiences in the Mekong Delta include collaborations with Can Tho University, Research Institute of Aquaculture 2, GiZ and WorldFish.



Within the '*nutritious-system pond*' project he will collaborate with all the partners and other identified stakeholders to establish an innovation platform to exchange ideas and develop a better product.

After few weeks in Wageningen University in the Knowledge Technology and Innovation Group, he will settle in the Mekong Region in January 2016 and start a series of consultations with project partners and other stakeholders important to the shrimp aquaculture feed sector in Vietnam. He will also facilitate communication between project partners and support project activities in the Mekong Delta.

More here: [Olivier Joffre](#)



