



FOOD & BUSINESS APPLIED RESEARCH FUND

The application of Lemna and biodigestate to enhance profitability of sustainable integrated farming (PROFARM), Indonesia

CONSORTIUM MEMBERS

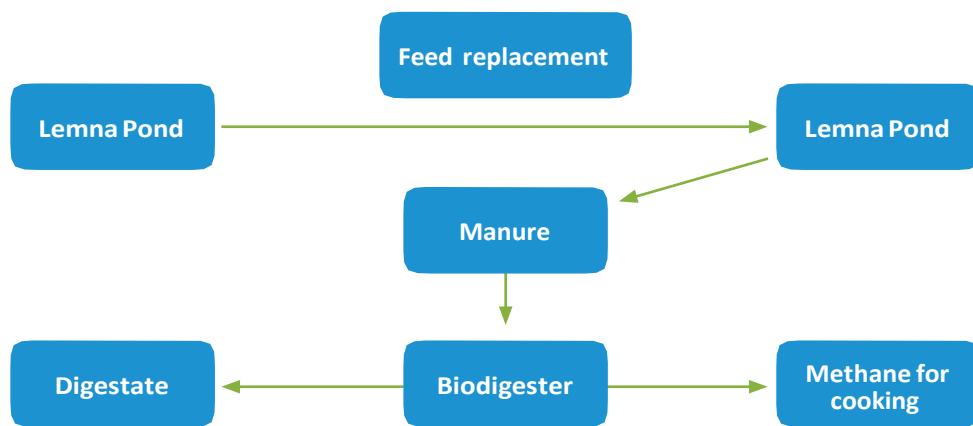
Hivos: Robert de Groot (Coordinator Green Energy Hivos SEA), Husnul Maad (Programme Manager Hivos SEA)
Rumah Energi: Lina Moeis (Executive Director)
Wageningen University & Research: Dr. Ingrid van der Meer (Senior Scientist and Mgr Business Unit Bioscience), Dr. Adrie van der Werf (Senior Researcher)
Padjajaran University: Dr. Ir. Iskandar, M.Si (Dean of Fisheries and Marine Science).

PROJECT DESCRIPTION

PROFARM aims at the application of *Lemna* sp. (floating waterplant also known as Duckweed) and biodigestate to enhance profitability of sustainable integrated farming in Indonesia. This high protein aquatic plant will be introduced to five farming households in combination with a bio-digester and a fish pond to assess the profitability of producing *Lemna* sp. (duckweed) to enhance the growth and product quality of animals (cows and fish) and the quality of biodigestate to increase crop yields. To optimize all streams within the integrated farming system *Lemna* sp. and bio-digestate will be analysed in labs and yields will be monitored while the research results will be used to guide farming families through the process in order to reach a profitable, sustainable mixed farming system.

OPPORTUNITIES AND CHALLENGES

Integrated Lemna Framing Systems in Indonesia



Optimize all streams of the integrated farming system

1. Quality and quantity of Lemna biomass
2. Quality and quantity of applied biodigestate
3. Quality and quantity of animal products

Replace 5-20% of commercial feed with protein-rich Lemna biomass, and so increase annual income of small scale farmers

First steps towards Lemna as a major food source for humans

IMPACT ACTIVITIES AND PRELIMINARY RESULTS

When grown under Dutch conditions Lemna may produce 15-20 ton dry weight per ha per annum with a protein concentration of 30-40% of dry weight.

Protein productivity per hectare is far higher than that of soybean.

Amino acid composition is comparable or even better than that of soybean.

Biodigestate grown Lemna gave similar productivities than when grown on nutrient solution.

Based on literature data and the prevailing climate, it is expected that productivity of Lemna in Indonesia will be far higher than in The Netherlands.

Preliminary results obtained in The Netherlands are now being used to advise small scale farmers in Indonesia on biodigestate application and harvest regimes.

First reactions of farmers look promising: 1) more milk productivity when Lemna is applied daily to cows, 2) Egg yolk color is improved.

The farmers in four provinces are enthusiastic in growing lemna in their ponds as it will reduce their cost on commercial fodder and increase of the quality of animal products.

