



Farm to Food Security: An Impact Evaluation of Tilapia Research under Thailand Research Fund

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Introduction

- Agricultural research plays an important role in addressing and solving current problems of farm and food security. Tilapia has become the third most important aquaculture fish after carp and salmon worldwide and has been the most crucial fish species in Thailand mainly for food security.
- The evolution of Tilapia aquaculture has derived from the investment in research and development under Thailand Research Fund (TRF). The impact assessment is crucial for designing the future research direction.



Source: FAO Fishery Statistics, 2006

Figure: Thailand



Objectives

- The study aims to evaluate the past investment of the Tilapia research projects.

Methods

OECD Impact Indicators

01

Relevance

- research program vs. national research policy
- research sub-projects' objectives vs. overall research program

02

Effectiveness

Reflexiveness of sub-projects' objectives to overall research programs objectives

03

Efficiency

Efficient time and resource uses under the research program

04

Impact

Magnitude of positive and negative impacts on economy, society and environment derived by the research program

05

Sustainability

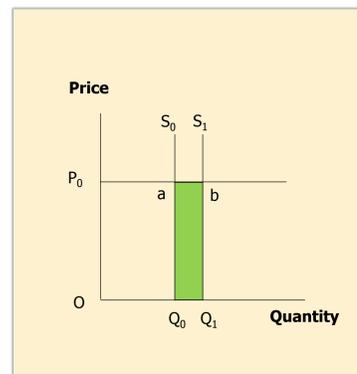
Continuity of the research program's outcomes and impacts

Source: Modified from OECD, 1992; ALNAP, 2006; Chianca, 2008

Evaluation Framework

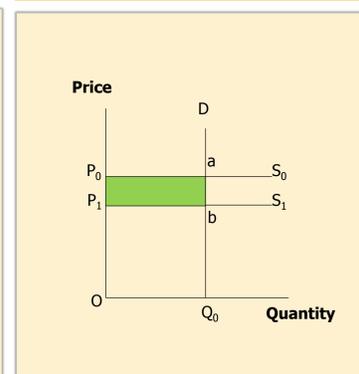
1

Value of extra production



2

Value of inputs saved



Source: Alston, J.M., G.W. Norton and P.G. Pardey. (1998)

Data

The data collected from 33 Tilapia research projects under the TRF's supports are assessed. In addition, the 8 case studies are evaluated intensely.

Research Investment Indicators

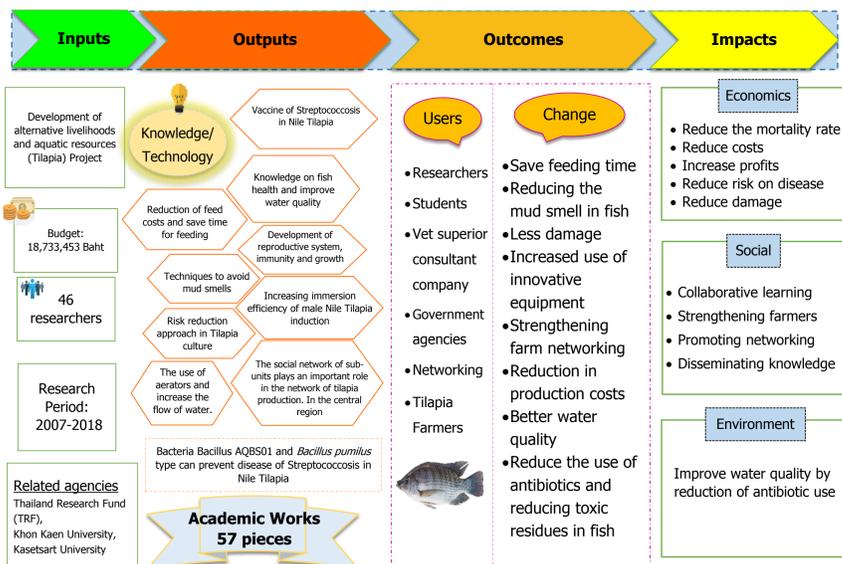
$$NPV = \sum_{t=0}^n \frac{(B_t - C_t)}{(1+r)^t}$$

$$BCR = \frac{\sum_{t=0}^n B_t(1+r)^{-t}}{\sum_{t=0}^n C_t(1+r)^{-t}}$$

$$\sum_{t=0}^n \frac{(B_t - C_t)}{(1+IRR)^t} = 0$$

Results

Research to Impact Pathway



Research to Impact Pathway of Research and Development of Tilapia

Project	Project name	OECD Indicators				
		Relevance	Effectiveness	Efficiency	Impacts	Sustainability
1	Vaccine of Streptococcosis in Nile Tilapia in the N-E of Thailand	✓	✓	✓	-	-
2	Application of Bacillus AQB501 to protect Streptococcosis in Tilapia	✓	✓	✓	**	✓
3	Development of Tilapia fish farming management	✓	✓	✓	*	✓
4	Optimization of infiltration method of male Tilapia fish	✓	✓	✓	-	-
5	Social network analysis and production index of black Tilapia in Samut Prakan, Nakhon Pathom, Ratchaburi, Chai Nat, Suphan Buri and Kanchanaburi	✓	✓	✓	→	✓
6	Study and evaluate the impact of risk factors on Tilapia (<i>Oreochromis niloticus</i>) industry of Thailand	✓	✓	✓	***	✓
7	Analysis and synthesis of knowledge from Tilapia cultivators for sustainable development of Tilapia culture	✓	✓	✓	*	✓
8	Cost and return analysis of Nile tilapia between developed and semi-developed systems: A case study of Banghug Aquaculture Club, Chonburi province	✓	✓	✓	*	✓
Program on Development of Alternative Livelihoods and Aquatic Resources (Tilapia)		✓	✓	✓	***	✓

Remark: *, **, *** = low, medium, high impacts; → = potential impact; \$ = need more investment



Source: Agriculture - A Tip of Knowledge (2017)

Ex-post Impact Evaluation of Tilapia Research Projects

NPV

163,288,270 Baht or 4,948,129 US\$ (in 2018)

BCR & IRR

BCR = 6.18 IRR = 53 %

Conclusion and Suggestion

Conclusion

- The past Tilapia research under TRF supports are worthwhile invested.
- The impact evaluation indicates that most Tilapia research met the OECD impact criteria on relevance and effectiveness.
- To come across with the efficiency and impact indicators, users and adoption must play an important role.
- The sustainability is a critical issue while farmers dis-adopt technology quickly after the project ended.

Suggestion

- In order to extend the impacts from farm to global food security, future research projects on Tilapia should be engaged more on target users' adoption to initiate higher economic impacts throughout the value chain.

Main References

Alston, J.M., G.W. Norton and P.G. Pardey. (1998). Science under Scarcity Principles and Practice for Agricultural Research Evaluation and Priority Setting. ISNAR, CAB International, UK. 585 pp.
Organization for Economic Cooperation and Development (OECD). 1992. Development Assistance Manual: DAC Principles for Effective Aid. Paris: OECD.

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