

Effectiveness of a participatory approach for collection of economic data in aquaculture systems at farm level in Brazil

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1 Introduction

The lack of economic information at farm level is one the most important bottlenecks in aquaculture sector, especially in developing and emerging countries (Flores & Pedroza Filho, 2014). This kind of information is crucial for decision making process at producer level and also concerning public institutions related to issues like insurance, credit, support policies, research, technology transfer and extension actions. However, gathering economic data in agricultural systems at farm level requires a substantial methodology in order to ensure reliability of results. This paper aims to evaluate the effectiveness of a participatory approach which is currently being applied by the Brazilian Agricultural Research Corporation (Embrapa) and Brazilian Confederation of Agriculture and Livestock (CNA) in aquaculture sector in Brazil.

2 Materials and Methods

Methodology consists in the collection and analysis of technical parameters, production costs and other economic data by applying panel method with producers of one specific region. Variables are obtained through consensus among participants of the panel (generally between 10 and 20) by using the criteria of the most frequent features of the fish farms (“modal or typical producer”). At the end of the panel, all collected data are analyzed and presented to producers in order to correct errors and to improve participants’ comprehension about their economic performance in aquaculture business. One panel is promoted in each production zone selected and later data is updated in a regular basis by calling input suppliers, fish farmers and wholesalers in order to monitor prices and inputs costs variation. The information is disseminated via newsletters on website periodically. Besides, participants receive the spreadsheet filled in panel for their own use in the farm as feedback. Data released consist of: costs of production, analysis of economic viability (e.g. net margins, net present value, effective operative cost), inputs and fish price index (Matsunaga *et al*, 1976).



Fig. 1. Panels with fish farmers in Brazil

This methodology is being used by several institutions in Brazil for collecting economic data at farm level in many different sectors as poultry, pork, cattle, soybean, cotton, sugarcane.

3 Discussion

The collection of economic data at farm level is critical because it is very dependent of producer’s capacity in providing reliable information. This capacity in offering reliable information is directly related to producers’ knowledge about all costs concerned to fish farming production. Often, producers have difficulty to describe all items because some costs are indirect (e.g. energy) or it depends on the assessment of other technical parameters (e.g. feed conversion ratio-FCR). Furthermore, sometimes these information are related to data which is strategic and, consequently, confidential. Therefore, producers may provide this sensible information in biased way.

Table 1. Zootechnical information and indicators used in the panels – Modal fish farmer of Tilápia in cage culture / São Francisco Valley, Bahia state.

Indicators	Unit	Quantity
Size of land for support area	hectares	3
Number of cage culture (6m ³)	Unit	250
Duration of cultivation cycle of fish	days	180
Final feed conversion ratio	Kg of feed/kg of fish	1,61
Final density	Kg of fish/m ³	144
Initial weight of fingerlings	g	25
Final weight of fish (harvest)	g	1.100

Thus, one of the challenges is to find a methodology able to overcome these barriers and assure reliable data. The panel methodology was chosen because it offers the possibility of solving this problem by using a participatory approach. In this methodology, the consistency of collected data is assured by a triangulation process in which each information must be confirmed by the majority of participants in a consensus process. Furthermore, the presence of agents from different segments of the productive chain (i.e. feed and fingerlings suppliers, fish farmers, processors, wholesalers, policy makers) reinforces the validation of the information.

Table 2. Economic indicators used in the panels – Modal fish farmer of Tilápia in São Francisco Valley/Bahia state.

Indicators	Unit	Quantity
Price of tilapia (gross profit)	R\$/kg	R\$ 5,50
Efective Operational Cost	R\$/kg	R\$ 3,50
Total Operational Cost	R\$/kg	R\$ 3,77
Gross profit margin	R\$/kg	R\$ 1,95
Net profit margin	R\$/kg	R\$ 1,73

Additionally, since the methodology is applied in several production regions, it is possible to compare the economic viability of diferent species in several geographical zones.

Table 3. Comparison between economic indicators of three production zones in Brazil

Production zone	Specie	Net profit margin (R\$/kilo)
São Francisco Valley/Bahia State	Tilapia	1,73
Northern region of Mato Grosso State	Amazonian catfish	1,13
Central region of Tocantins State	Tambaqui (<i>Colossoma macropomum</i>)	0,18

4 Conclusions

As positive aspects, the methodology shows a strong reliability of data because information is directly provided by a representative sample of producers. Moreover, data collection presents a low cost compared to individual visits to producers or to surveys method. Continuous updating of database and the high level of participation of producers are other assets of this methodology. Despite its effectiveness, the method also presents some challenges as: (a) Heterogeneity of producers' profile and consequent difficulty in standardizing data; (b) Logistic requirements related to team travel and organization of panels; (c) Producers' mobilization in order to assure their presence in panels.

One important advantage is the possibility to cover a large number of production zones, which is crucial in a large country like Brazil. For example, in large states like Mato Grosso (903.366,192 km²) it is possible to collect data in 3 fish farming regions in one week. Other advantage of this methodology refers to its low cost compared to other methods as census research, for example. Basically, the main cost for data collection consists in one travel into the production zone for a team of 3 people. This travel includes one panel with duration of about 4 to 5 hours and field visits in 1 to 2 fish farmers. In order to ensure the updating of the economic data, a trainee is in charge of monitoring inputs costs and fish prices by calling suppliers and producers by phone.

References

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