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Research Article

Risk Factors Associated With Poor Shrimp Aquaculture in Egypt

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Abstract

Shrimp farming has been heralded as part of a 'Blue Revolution', capable of providing food whilst allowing wild stocks to recover from over-fishing. The industry has experienced spectacular growth in recent years. Today, farmed shrimp account for about one third of global consumption of shrimp, having a retail value of US$50–60 billion. Mounting evidence raises serious concerns over the environmental and economic sustainability, as well as social equity, of large parts of the shrimp farming industry.

The aim of this study was to assess the most prominent risk factors associated with poor shrimp aquaculture in Egypt. For this purpose 80 villages were selected randomly from different Dakahlia governorate districts where a questionnaire about the hypothesized risk factors was constructed.

The final multivariate logistic regression model showed, a significant association between poverty ($p<0.05$), aquaculture area tourism consideration ($p<0.05$), aquaculture area military consideration ($p<0.05$), availability of man power ($p<0.05$), carrying out individual interview for data collection ($p<0.05$), respond ability of governmental organizations in data collection ($p<0.05$) and poor shrimp aquaculture in Egypt.

According to our knowledge, this is the first paper discussing the most prominent risk factors regarding poor shrimp aquaculture in Egypt.

Keywords: Aquaculture; Egypt; Shrimp

Introduction

Large sections of Africa and the Middle East, with their rich natural heritage, high biodiversity and relatively unspoiled coastal environment, hold tremendous potential for the development of commercially viable shrimp aquaculture. More than a dozen countries in the two regions already have some 50-100 commercial shrimp aquaculture operations up and running. These operations range from tiny, extensive artisanal operations to quite large, intensive production systems [1].

In fact, given the problems of disease (and crashing production systems) and the over development of the industry in a number of other countries, investors have begun to look seriously at Africa and the Middle East as potential areas for investment. Environmental activists are interested in preventing the negative impacts of the industry in these regions. To date, however, the perceived advantages of these two regions have been insufficient to lure significant investments in shrimp aquaculture in either region. However, investments are increasing. Madagascar, Egypt and Iran already have small, but important shrimp aquaculture industries [2].

Aquaculture production is also skewed geographically with Asia producing over 90% of global products, dwarfing Africa and Latin America at less than 0.5% and 2%, respectively. In China, with 67% of global aquaculture production, inland aquaculture production has increased at least fivefold in the past decade; it has only doubled in the rest of the world, implying large potential in other developing countries if constraints to its expansion were removed [3].

By mid-1990s, when Egypt's catch of wild-caught shrimp began to decrease in size, the government began to encourage the private sector to develop shrimp farming. The goal was to create an industry capable of producing large commercially valuable shrimp [4].

The objective of this study was to discuss different risk factors associated with shrimp aquaculture in Egypt and through the beam on the most important ones.

Materials and Methods

Demography

This study was carried out during the period from October 2011 to July 2012 at the Dakahlia governorate, Egypt (N 29° and E 25.48°) according to GPS reading (Garmin's eTrex Legend personal navigator). Dakahlia governorate is present in the east of the Delta of the Nile and covers about 3.459 km. It locates in a very strategic location overlooking Damietta branch of the River Nile and the Mediterranean Sea coast and boarded with El- Sharkia governorate from the east, El-Kharbeya governorate from the west and Damietta governorate to the North West. The weather in this area is moderate throughout the year and the rate of rains is quite higher than that of Cairo.

Questionnaire

A questionnaire was carried out to collect data about the risk factors associated with poor shrimp aquaculture in Egypt where participatory disease surveillance was the applicable method. About 200 (fishermen, fish vendors, economists and coastguard) were

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requested to fulfill the questionnaire. Fishermen and fish vendors have many data and are good experience about the study.

Statistical analysis

All data analyses were performed by using statistical software program (SPSS for Windows, Version 15.0, SPSS Inc., and Chicago, USA). Association between the occurrence of poor shrimp aquaculture and the hypothesized risk factors was firstly carried out by univariate analysis using chi square (χ2-test). Variables with significant association at P≤0.1 (two-sided) were subjected to the multivariate logistic regression model. With multivariate logistic regression, Hosmer and Lemeshow's goodness of fit statistic test greater than 0.05 was used to imply that the model's estimates fit the data at an acceptable level in multivariate analysis. The results were each expressed as p value and Odds Ratio (OR) with a 95% Confidence Interval (CI 95%). On multivariate logistic regression model, variables are considered significant at $p < 0.05$.

Composition of the field teams

Field teams surveying each village were composed of two members from General Organization of Veterinary Services (GOVS). They were responsible for interviewing peoples and data collection.

Gathering and analysis of the questionnaires from the villages

The questionnaires used contained qualitative and quantitative information on the risk factors associated with poor shrimp aquaculture in Egypt.

Results

Table 1: Classification and levels of risk factors suggested to affect the prevalence of poor shrimp aquaculture in Egypt.

Variable	Levels
Number of visits to each village to collect data	One visit=1; two visits=2; three visits=3
Availability of land as feddan	Present=1; not present=0
Respond ability of nongovernmental organizations in data collection	Good response =1; poor response = 0
Respond ability of governmental organizations in data collection	Good response =1; poor response = 0
Number of interviews in each visit	One interview=1; two interviews=2; three interviews=3
Presence of key informants	Not present =0 ; present = 1
Carrying out individual interviews for data collection	Yes = 1; No=0
Carrying out group interviews for data collection	Yes =0; No =1
Suitability of agricultural seats	Present =1; not present =0
Presence of water supplies	Present =1; not present =0
Presence of high salinity	present =1 ; Not present =0
Aquaculture area tourism considerations	Not present =0; present =1
Aquaculture media	Present =1; not present=0
Season	Winter=1; summer=2; autumn=3; spring=4
Species	Small species=1 ; large sized species=2
Availability of hatcheries	Not present=0 ;Present=1
Education level of farm owners	Illiterate=1; primary=2; metric=3; graduate=4; post graduate=5
Presence of nursery farms	Not present=0; present=1
Presence of live planktons	Not present=0; present=1
Poverty	Not present=0; present=1
Contamination	Not present=0; present=1
High cost	Not present=0; present=1
Availability of environmental data	Not present=0; present=1
Availability of research	Not present=0; present=1
Competition and restrictions on coastal lands	Not present=0; present=1
Availability of manpower	Not present=0; present=1
Availability of specialized feed	Not present=0; present=1
Farming system	Extensive=0; semi-intensive=1; intensive=2

Table 2: Distribution of risk factors in poor shrimp aquaculture and good aquaculture.

			Good aquaculture	Poor aquaculture
Variable	Number (20)	%	Number(60)	%
Number of visits to each village to collect data				
1	0	0	39	65
2	0	0	16	26.66
3	20	100	5	8.334
Availability of land as feddan				
0	0	0	26	43.333
1	20	100	34	56.667
Respond ability of nongovernmental organizations in data collection				
0	0	0	0	0
1	20	100	60	100
Respond ability of governmental organizations in data collection				
0	5	25	33	55
1	15	75	27	45
Number of interviews in each visit				
1	0	0	34	56.667
2	0	0	26	43.333
3	20	100	0	0
Presence of key informants				
0	0	0	21	35
1	20	100	39	65
Carrying out individual interviews for data collection				
0	6	30	7	11.67
1	14	70	53	88.33
Carrying out group interviews for data collection				
0	4	20	0	0
1	16	80	60	100
Suitability of agricultural seats				
0	0	0	0	0
1	20	100	60	100
Presence of water supplies				
0	0	0	0	0
1	20	100	60	60
Presence of high salinity				
0	4	20	10	17.67
1	16	80	50	83.33
Aquaculture area tourism considerations				
0	17	85	51	85
1	3	15	9	15
Aquaculture area military considerations				
0	16	80	10	17.67
1	4	20	50	83.33
Aquaculture area environmental considerations				
0	12	60	7	11.667

1	8	40	53	88.333
Aquaculture media				
0	12	60	7	11.667
1	8	40	53	88.333
Season				
1	0	0	27	45
2	0	0	6	10
3	14	70	27	45
4	6	30	0	0
Species				
1	0	0	21	35
2	20	100	39	65
Availability of hatcheries				
0 1	0 20	0 100	40 20	66.667 33.333
Education level of farm owners				
1	7	35	11	18.333
2	9	45	30	50
3	4	20	16	26.557
4	0	0	3	5
5	0	0	0	0
Presence of nursery farms				
0	0	0	0	0
1	20	100	60	100
Presence of live plankton				
0	0	0	0	0
1	20	100	60	100
Poverty				
0	0	0	25	41.666
1	20	100	35	58.334
Contamination				
0	0	0	0	0
1	20	100	60	100
High cost				
0	0	0	0	0
1	20	100	60	100
Availability of environmental data				
0	0	0	21	35
1	20	100	39	65
Availability of research				
0	0	0	0	0
1	20	100	60	100
Competition and restrictions on coastal lands				
0	20	100	30	50
1	0	0	30	50

Availability of man power				
0	0	0	17	28.333
1	20	100	43	71.67
Availability of specialized feed				
0	20	100	57	95
1	0	0	3	5
Farming system				
0	13	65	32	53.333
1	6	30	18	30
2	1	5	10	46.667

Table 3: Final multivariate logistic regression model for risk factors associated with poor shrimp aquaculture in Egypt.

Variable	[1]β	[2]SE	Odds	P	[3]CI
Respond ability of governmental organizations in data collection	1.299	.578	5.054	.025	3.667
Carrying out individual interviews for data collection	-2.097-	.767	7.467	.006	.123
Poverty	1.686	.432	15.208	.000	5.399
Aquaculture area tourism considerations	-2.430-	.608	15.955	.000	.088
Aquaculture area military considerations	-1.573-	.427	13.572	.000	.207
Aquaculture area military considerations	-1.009-	.470	4.605	.032	.365

[1]β: Regression coefficient
[2]SE: Standard Error
[3]CI: Confidence Interval at 95%

Discussion

Shrimp aquaculture is an industry that has undergone more advance with relatively little planning and regulation. As a result, the expansion of shrimp aquaculture has come at a considerable cost to the natural environment. Indeed, there exist real concerns about the sustainability of shrimp aquaculture as conducted under most current systems of production [5].

Data collection from governmental organizations has a leading role through both, sharing information in a timely, open and transparent manner and building existing mechanisms of cooperation and strengthening [6].

In order to collect valuable, appropriate and detailed information; Individual interview is considered as a pioneer method especially, when there is an expected verities of different stories and where the topic to be discussed is sensitive where a respondent may be unable to tell his experience in presence of others, or where there is a possibility that the story told could contaminate other participants stories [7].

In Egypt, poverty plays a great role in shrimp aquaculture development as the majority of shrimp farmers, operators, caretakers or laborers engaged in Aquaculture are poor. The poor are often characterized by low risk bearing ability, lack of rights to reach and use the resources and weak entitlements to convert available resources into outcomes where they have access [8].

Marine protected areas in Egypt such as military and tourism areas could be a conflict in shrimp aquaculture. Many circumstances in different aquaculture areas may play this role such as bioecological, territorial and socio-economic considerations [9].

Shortage of technical manpower exists in the shrimp aquaculture industry. This includes in shrimp breeding, culture, disease detection and treatment, processing, marketing, extension, socio-economics, environment, water quality and soil profiles [10].

Conclusion

From the previous mentioned results we conclude that there were main six factors associated with poor shrimp aquaculture in Egypt which include Respond ability of governmental organizations in data collection, carrying out individual interviews for data collection, poverty, aquaculture area tourism considerations, aquaculture area military considerations and availability of man power. Further studies are needed to enhance good shrimp aquaculture in Egypt.

Refrences

1. Sadek S, Rafael R, Shakouri M, Rafomanana G, Ribeiro FL, Clay J . Shrimp Aquaculture in Africa and the Middle East: The Current Reality and Trends for the Future. Report prepared under the World Bank, NACA, WWF and FAO Consortium Program on Shrimp Farming and the Environment. Work in Progress for Public Discussion. Published by the Consortium. 2002; 42.

2. FAO. Report of the Bangkok FAO Technical Consultation on Policies for Sustainable Shrimp Culture. Bangkok, Thailand, 8-11 December 1997. FAO Fisheries Report No 572. 1998; 31.

3. FAO. 'Asia-Pacific Fishery Commission'. FAO Fisheries Report 610 of the Ad Hoc Working Group of Experts in Rural Aquaculture, Bangkok, Rome: FAO. 1999; 22.

4. World Bank. Report on Shrimp Farming and the Environment – Can Shrimp Farming be Undertaken Sustainability? A Discussion Paper designed to assist in the development of Sustainable Shrimp Aquaculture. World Bank. Draft. 1998.

5. EJF. Farming The Sea, Costing The Earth: Why We Must Green The Blue Revolution. Environmental Justice Foundation, London, UK. 2004.

6. United States National Strategy for Pandemic Influenza. 2005.

7. Onwuegbuzie AG, Leech NL, Collins KMT. 'Innovative data collection strategies', qualitative research. 2010; 15: 696-726.

8. Haylor G, Bland S. Integrating Aquaculture into rural development in coastal and inland areas. Subasinghe RP, Bueno P, Phillips MJ, Hough C, McGladdery SE, Arthur JR, editors. In: Aquaculture in the Third Millennium. Technical Proceedings of the Conference on Aquaculture in the Third Millennium, Bangkok, Thailand, 20-25 February 2000. NACA, Bangkok and FAO, Rome. 2001; 73-81.

9. FAO. Fisheries management. 4. Marine protected areas and fisheries. Publishing Policy and Support Branch, Office of Knowledge Exchange, Research and Extension, FAO, Viale delle Terme di Caracalla, 00153 Rome, Italy. 2011

10. Sadek S. Aquaculture in Egypt: Past Evolution, Present Status and Priorities for Research to Secure a Sustainable Development. European Aquaculture Society and World Aquaculture Society- AQUA 2000, Nice, France. 2000.

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