

Full Length Research Paper

Assessment of shrimp farmers viewpoint toward potential obstacles in Chabahr City, Iran

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This paper investigates the attitude of shrimp growing managers toward current problems in 2010. The region is located in Chabahar city of Sistan and Baluchistan province, Iran. The population of this study included 36 to 61 farms. Data was collected through fishery organization, cooperative department and also interviews with decision-making units (DMUs) managers. The validity of the questionnaires was evaluated by experts and faculty members of the University. Cronbach alpha coefficient was used in order to assess the reliability of questionnaire scale, which measured as an acceptable coefficient more than 0.7 in all of the parts. The managers' attitudes were investigated toward financial affairs, human resources, competitiveness, existing infrastructure, laws and government policies. At last, the main obstacles and problems were identified in these farms. Regarding the results about ranking of market and competitiveness, it is better to create domestic market by accompaniment of government, so that it could provide the producers with better conditions. Furthermore, it increases per capita shrimp consumption in country. On the other hand, to maintain and even expand competitive global markets, allocating subsidies for shrimp exports, besides improving road asphalt at non-residential Guatr and reducing the costs of shrimp production are suggested. Bad market conditions and non-optimal allocation of financial resources are drastic obstacles for developing these pools. These problems should be taken care of via low-interest loans and advertisements about shrimp consumption benefits. Moreover, improving manpower productivity is a way to reduce the gap of shrimp productivity of Iran comparing to shrimp exporters in other countries. Therefore, special training courses to boost manpower productivity in Guatr restrict are recommended.

Key words: Managers' attitude, Chabahar, production, shrimp.

INTRODUCTION

Aquaculture has an important economic role in countries which have coastal frontier and it can be a donated golden opportunity to occupation, community development, poverty alleviation, reduction in overuse of natural coastal resources, and food security (Hewitt et al., 2006). Furthermore, the shrimp culture trade provides valuable foreign exchange especially as well as creating jobs opportunities for underdeveloped countries (Primavera, 1997). Considering the well weather conditions and accessibility of space, shrimps' industry has been

developed mainly in tropical and subtropical regions (Pjez-Osuna, 2001).

Capacity of shrimp culture in southern province of Iran has provided opportunities investment for private and public sector towards shrimp production. These shrimps' farms are situated in the direction of 2,000 km coastline in the southern parts of Iran from Abadan province southwest through Bushehr province, Hormozghan province and eventually to Guatr in the southeast, near the Guatr gulf and the border of Pakistan (Salehi, 2010).

Cooperatives have an important economic role to the GDP component, increasing shrimp productivity and national income. Considering remarkable investments of shrimp cooperatives at Guatr gulf in Sistan and

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Baluchistan province, it is necessary to assess decision-making units (DMUs) and pay attention to management issues from an economic point of view. The following topic reviews an abstract of the most important research concerning the paper.

Chu et al. (2010) had a survey on stakeholders' attitude of aquaculture and implications for its future in America and Norway. The results show that there is a relationship among aquaculture stakeholders' perceptions and their subsequent actions. They indicate the perceptions of aquaculture stakeholders regarding aquaculture's social, economic, and environmental benefits, as well as impacts and constraints that can significantly affect their decisions regarding whether or not to actively support aquaculture expansion over the next three years, regardless of country.

Whitmarsh and Wattage (2006) investigated public viewpoints towards the environmental impact of salmon aquaculture in Scotland. It is expressed that the public section has an important role to reduce environmental damage from aquaculture. Furthermore, getting better product quality and keeping employment have approximately equal weights. Moreover, staying away from conflicts and ensuring fair prices like competitiveness are given the lowest priorities.

Galvão et al. (2005) had a survey on environmental awareness in shrimp culture in Rio Grande do Norte, Brazil. It investigated the viewpoint of marine shrimp producers on the environmental management impacts for improving competitiveness. Results of this survey showed that 41% of the shrimp producers believed to confront aggressive competitiveness of marketing, and that the activity produces few environmental impacts. In addition, their results proved the existence of dependence among the viewpoints of the respondents toward the environmental impacts and importance of environmental issues on consumer purchase decisions.

Baticados (2004) assessed fishing cooperatives' participation in managing near-shore resources in Capiz. It showed that in the absence of official resource management plans, members of cooperatives can choose some detailed plans for achieving success that are based on self-management, in order to protect the resources if only the sustainability of livelihood of farmers is severely threatened. They indicated fishing cooperatives, however, fail as a source of information on regulation and conservation education of members, but if they were to undertake more education and training programs on near-shore management, cooperatives may become an effective social force in changing the present fisheries management system.

Sanchez and Muir (2003) investigated fishermen viewpoint on the resources management and aquaculture development in Tabasco, Mexico. It is deduced that situations of these fisheries have worsened; insomuch collective aggregation no longer is producing a positive consequence for the local communities.

Robertson and Carlsen (2001) investigated the effect of balanced information on attitudes to open ocean aquaculture development in New England. It is concluded that the majority of participants were not familiar with aquaculture. Furthermore, more than 70% of participants had positive attitudes towards aquaculture development. Finally, it is expressed that acquaintance has had an effect on attitudes of participants who familiar with aquaculture were having more positive attitudes towards it than respondents who are strange or uncertain of their familiarity.

Subasinghe et al. (1999) had a thematic review management strategy in shrimp aquaculture. This paper discusses on management strategies in shrimp aquaculture. It summaries 15 countries review papers on the impacts of socioeconomic as well as the assessment of failures and achievements in both public and private sector interventions to solve major problems of management for sustainable shrimp culture industries.

Sinchipanich and Wongsanga (1999) assessed the viewpoints of local resident toward aquaculture in Mahasarakarm. Results showed that 14% of respondents totally agreed with the project, 14.8% partially agreed, 7.3% partially disagreed, and 6.8% strongly disagreed. They expressed that the most frequently mentioned recommendations for improvement were extent of public relations; fish stocking density, market strategy, and income from activity; and type of fish cultured, pond size, and pond layout. They found out that none of the samples had engaged in any fish culture activities. Their study's results indicated that the frequency of being visited by DOF staff was significantly related to the perception of project existence. Furthermore, it is found that perception of project existence is related to respondent's attitude toward the demonstration project itself.

Baticados et al. (1998) surveyed fishing cooperatives and their importance in managing fishery resources in Capiz, central Philippines. They concluded fishery cooperatives can co-manage coastal fishery resources, help improve the living conditions of small-scale fishers, and slow down the rapid depletion of these resources.

In this study, attitude of shrimp farms managers was investigated to be the most important problems in Guatr Gulf, Iran. The Importance of shrimp production for regional farms as well as necessity of solving units problems resulted to this study. Finally, after analyzing viewpoint of farms managers to different issues, some solutions have been offered.

METHODOLOGY

The present study assesses viewpoint of shrimp managers toward current problems. Perceptions cannot be observed unless from self-reported responses or inferred from explanation of behavior (Heberlein et al., 2005; Chu et al., 2010). Therefore, a questionnaire was used to determine managers' attitude toward current problem in Guatr Gulf, Iran.

Required data of shrimp farms were collected by means of questionnaires. Validity of the questionnaire was achieved by Faculty members of the University of Agricultural Extension and Education as well as experts of fishery organization. To determine the reliability of the questionnaire, it uses Cronbach alpha, so that coefficient of acceptable-more than 0.7 in all of parts- was achieved. The statistical population consisted of shrimp cooperatives and non-cooperative that were gathered through interview managers which were activated in 2006. Due to the disease and Gonu cyclone, in the recent years, the number of population was only 25 in 2009; therefore a census of active population performed in 2006. The population surveyed through census (N = 61). Afterwards, 36 out of 61 questionnaires were collected. Finally, the managers' attitude was investigated toward financial issues, human resources, competitiveness and existing infrastructure.

Descriptive statistics

The analysis of descriptive statistics showed all the respondents were male. Eight percent of respondents had elementary education. Approximately forty-two percent of the respondents had high school diploma. Fifty percent of them were graduates from college. The average of production was 2.36 ton/ha. The yield of 11.1% of the participants was less than 1.5 ton. Twenty five percent had 1.5 to 2 tons and 25% had 2 to 2.5 tons besides 13.9% of them had 2.5 to 3 tons. Twenty five percent had more than 3 tons. Background explains the number of periods that the participants had produced shrimp. The average of this variable was 4.33 periods. Other characteristics are shown in the Table 1.

RESULTS

Managers' attitude toward cooperation and cooperative

Ranking of managers' attitude toward cooperation and cooperative are shown in Table 2. Regarding the means, the items of "Producers have a positive approach about plans of cooperative management" (M = 3.45) got maximum level of agreement. The results of this issue are very similar to outcomes of Perez-Sanchez and Muir's study (2003). They concluded that "this Agreement was highly significant amongst respondents when asked about the importance of the reorganisation of cooperative institutions".

The result show cooperatives' managers did not agree "There is a competition between cooperatives and non-cooperatives farms".

Managers' attitude toward management and manpower

Table 3 shows cooperatives managers' attitude toward management and manpower. Regarding the mean of this variable, "Employ permanent employee, increases the margin (M = 3.67)" and "Academic education increases productivity (M = 3.44)" achieve the high level of agreement. Furthermore, "Employ of Journeyman reduces

variable costs (M = 1.94)" and "Guatr shrimp farms have less comparative productivity" got the least agreement.

Managers' attitude toward financial affairs

Table 4 shows cooperation's manager attitude toward financial affairs. Regarding the means, the item of "Managers have sufficient knowledge about turnover (M = 4.44)" got the maximum level of agreement. Moreover, "Shrimp farms have adequate internal resource for investment (M = 2.44)" and "All of the loans that had been paid by the government were invested at the shrimp farms (M = 2.47)" got the most agreement.

Managers' attitude toward market and competitiveness

Table 5 shows cooperatives manager attitude toward market and competitiveness. Using means as an indicator, the item of "Shrimp farms are at the global competitiveness market (M = 4.03)" got the most agreement. In fact, inappropriate market conditions and non-optimal allocative financial resources are the major obstacles of developing in these farms. Furthermore, the item of "There is a good proportion between domestic supply and demand (M = 2.11)" got the minimum level of agreement (maximum level of disagreement). Attitudes to market opportunities were investigated by Sanchez and Muir's research (2003) as well. They discuss fishing organisations have an important local market however; market conditions can be controlled by middlemen like pricing and distribution. According to their indicators, they concluded "The level of agreement regarding aquaculture as means of gaining new distribution networks within national and export markets" was highly significant and gain the most agreement.

Managers' attitude toward government policies

Table 6 shows managers' attitude toward government policies. Using means as indicators, the item of "Expansion of shrimp farms are based on government policies (M = 3.64)" got the maximum level of agreement. Moreover, the item of "Comparative support of government was not sufficient in comparing to other countries (M = 2.39)" got the minimum level of agreement (maximum level of disagreement).

In this context, Chu et al. (2010) investigated perceptions about negative aspects and constraints of aquaculture". One of the variables in this issue was "Lack of clear government leadership has limited aquaculture development" which it had a significantly positive effect at the 1% significance level (The definition of this variable is

Table 1. Descriptive statistics.

Variable	Levels of variable	Frequency	Percentage	Mean	SD	Max	Min
Yield	Less than 1.5	4	11.1	2.36	0.70	1.17	3.61
	Between 1.5 to 2	9	25.0				
	Between 2 to 2.5	9	25.0				
	Between 2.5 to 3	5	13.9				
	More than 3	9	25.0				
Background (period)	Less than 2	1	2.80	4.33	1.19	1	10
	Between 2 to 4	4	11.10				
	Between 4 to 6	3	8.30				
	Between 6 to 8	2	5.60				
	More than 8	26	72.20				
Education	Elementary	3	8.30	-	-	-	-
	High school diploma	15	41.70				
	Graduated	18	50.00				
Farming system	Non-cooperatives farms	26	72.20	-	-	-	-
	Cooperative	10	27.80				
Supervision type	Remote control	13	36.10	-	-	-	-
	Part-time	14	38.90				
	Full time	9	25.00				

Table 2. Ranking of managers attitude toward cooperation and cooperative.

Indicator	M*	SD	Rank
Producers have a positive approach about plans of cooperative management.	3.45	1.2	1
Cooperative management was a good bankroll for continuation of activities.	3.22	0.96	2
State institutions had important role to persuasion of private units to form cooperative	2.83	0.84	3
Private units have sufficient awareness about cooperative units.	2.81	1.06	4
Cooperative units are more effective and productive.	2.67	1.37	5
There are competition between cooperative and non-cooperatives farms	2.25	0.97	6
Total	2.87	0.62	-

* Scale: 1 = Strongly disagree; 2= disagree; 3 = no opinion; 4 = agree; 5 = strongly agree.

very similar to second item in Table 6 which is significant as well).

Comparison of managers attitude between cooperatives and non-cooperative farms (Mann-Whitney test)

Mann-Whitney test was applied to compare managers' attitude on both cooperative and non-cooperative units which is shown in Table 7. The result showed that there is a significant difference between cooperatives and non-cooperative in relation to financial affairs ($U = 73.00$, $Z = -$

2.03 , $\text{sig} = 0.04$). In other words, attitude of non-cooperative farms (mean rank = 20.69), was more favorable than cooperative farms (mean rank = 18.80). Furthermore, there is a significant difference between these units toward market and competitiveness. Meanwhile there were no significant differences between other attitudes.

Comparison of managers' attitude by supervision type (Kruskal-Wallis test)

In order to compare mean of "supervision types" in

Table 3. Ranking of managers attitude toward management and manpower.

Items	M*	SD	Rank
Employ permanent employee increases the margin.	3.67	0.96	1
Academic education increases productivity.	3.44	1.21	2
The base of production is management.	3.42	1.27	3
The margin can be increased by application of new management techniques.	3.39	1.13	4
The margin can be increased by profit sharing with a permanent wage.	3.28	0.97	5
Increasing manpower wages can supply more profits.	2.94	1.29	6
The management of shrimp farms is not acceptable.	2.78	1.44	7
Guatr's manpower has less skills and experiments than others regions.	2.39	1.18	8
The margin can be increased by employing experts.	2.24	1.22	9
Guatr shrimp farms have less comparative productivity.	2.22	1.12	10
Variable costs reduces journeyman employee.	1.94	0.95	11
Total	2.88	0.61	-

*Scale: 1 = Strongly disagree; 2 = disagree; 3 = no opinion; 4 = agree; 5 = strongly agree.

Table 4. Managers' attitude toward financial affairs.

Items	M*	SD	Rank
Managers have sufficient knowledge about turnover.	4.44	0.81	1
Related organizations have acceptable cooperation with shrimp farms to improve their efficiency.	3.89	1.14	2
There is a favorable profit rate in farm unites.	3.58	1.48	3
There is a little investment risk in Guatr district.	3.50	1.46	4
Loan payments are adequate for production process.	3.33	1.33	5
There is no postponement at payment of loans.	3.14	1.17	6
Loan interest rate was appropriate so that managers could pay their debt.	3.03	1.38	7
Variable cost like feed cost was expected.	2.81	1.58	8
All of the loans that had been paid by the government were invested at the shrimp farms.	2.47	1.05	9
Shrimp farms have adequate internal resource for investment.	2.44	1.52	10
Total	3.26	0.37	-

*Scale: 1 = strongly disagree; 2 = disagree; 3 = no opinion; 4 = agree; 5 = strongly agree.

relation to managers' attitude, Kruskal-Wallis test was employed as shown in Table 8. The findings show that the mean of respondents' attitude toward the manager attitude significantly was different when examined by the type of their supervision for indexes of "managers' attitude toward cooperative ($\chi^2 = 8.76$, sig = 0.01)" and "managers' attitude toward financial affairs ($\chi^2 = 10.27$, sig = 0.006)" and "manager attitude toward market and competitiveness ($\chi^2 = 8.45$, sig = 0.02)".

Correlation analysis

The correlations among the variables in Table 9 reveals that "managers' attitude toward financial affairs"

are significantly related to "managers' attitude toward cooperative" ($r = 0.510$ and sig = 0.001). Furthermore, there was a significant relation between "managers' attitude toward government policies" and "managers' attitude toward financial affairs" ($r = -0.47$ and sig = 0.004). The index of "manager attitude toward management and manpower" had a significant relation with "academic education ($r = 0.57$ and sig = 0.00)" and "academic education" significantly related to "yield" ($r = -0.370$ and 0.030). Moreover, variable of "background" significantly related to "manager attitude toward cooperative ($r = 0.360$ and sig = 0.03)", "manager attitude toward financial affairs ($r = 0.580$ and sig = 0.00)", "manager attitude toward government policies ($r = -0.35$ and sig = 0.037)", "yield ($r = 0.47$ and sig = 0.004)" and

Table 5. Managers' attitude toward market and competitiveness.

Items	M*	SD	Rank
Shrimp farms are at the global competitiveness market.	4.03	0.94	1
Export market is one of the important challenges in Guatr district.	3.58	1.34	2
Advertisement has an important effect in domestic marketing.	3.08	1.27	3
Managers have sufficient knowledge about international markets.	2.81	1.17	4
Expensive new technologies reduce competitiveness of shrimp farms.	2.80	1.33	5
There is a good proportion between domestic supply and demand.	2.11	1.06	6
Total	3.07	0.36	-

*Scale: 1 = strongly disagree; 2 = disagree; 3 = no opinion; 4 = agree; 5 = strongly agree.

Table 6. Managers' attitude toward government policies.

Items	M*	SD	Rank
Expansion of shrimp farms are based on government policies.	3.64	0.76	1
Policy decisions of related organizations to aid shrimp units, did not improve their productivity.	3.00	1.22	2
Allocated credits and incentives to shrimp breeding units are not effective enough to improve their activities.	2.83	1.40	3
Creation Domestic and abroad markets are not possible without government aides.	2.72	1.45	4
Support of government was not sufficient in comparing with the other countries.	2.39	1.48	5
Total	2.91	0.47	-

*Scale: 1 = Strongly disagree; 2 = disagree; 3 = no opinion; 4 = agree; 5 = strongly agree.

Table 7. Comparison of managers' attitude between cooperatives and non-cooperative units (Mann-Whitney test).

Attitudes	Farming system		Mann-Whitney U	Z	Sig.
	Non-cooperatives farms (n=26)	Cooperatives (n=10)			
	Mean rank	Mean rank			
Attitude toward cooperative	18.35	18.90	126.00	-0.14	0.90
Attitude toward management and manpower	19.33	16.36	108.50	-0.76	0.45
Attitude toward financial affairs	20.69	12.80	73.00	-2.03*	0.04
Attitude toward market and competitiveness	20.58	13.10	76.00	-1.93	0.06
Attitude toward government policies	16.90	22.65	80.50	-1.48	0.14

*p ≤ 0.05.

finally "academic education(r = 0.33 and sig = 0.048).

DISCUSSION

Ranking of managers' attitude to cooperation and cooperative showed two items included "Producers have a positive approach about plans of cooperative management" and "Cooperative management was a good bankroll for continuation of activities" achieved the most agreement (like Sanchez and Muir's (2003) research as was mentioned); While the two items "cooperative units are more effective and productive than

private units" and "there is a competition between cooperative and non-cooperatives farms" expressed the most disagreement. Hence, paying attention to cooperative benefits could be offered considering some programs, Such as briefing sessions with content cleared benefits of cooperatives. However, due to the recent problems, including white spot disease of shrimp and the tropical storm-Cyclone Gonu-a significant number of regional cooperatives have been inactive in recent years and some cooperatives managers' debt from banks is led to make this attitude that the efficiency of cooperative units is not more than non-cooperative units. In this regard, it is suggested that according to government

Table 8. Comparison of managers' attitude by supervision type (Kruskal-Wallis test).

Attitude	Mean rank of supervision type			Chi-square	Sig.
	Remote control (n=13)	Part time (n=14)	Full time (n=9)		
Attitude toward cooperative	24.96	13.07	17.61	8.76**	0.01
Attitude toward management and manpower	14.27	19.18	23.56	4.25	0.12
Attitude toward financial affairs	25.65	15.96	12.11	10.27**	0.006
Attitude toward market and competitiveness	13.5	24.71	16.06	8.45*	0.02
Attitude toward government policies	19.12	15.89	21.67	1.74	0.42

*p ≤ 0.05; **p ≤ 0.01.

Table 9. Correlation analysis.

Variable and dependent variable		Correlation coefficient and P-value							
		1	2	3	4	5	6	7	8
1	Attitude to cooperative	1	-	-	-	-	-	-	-
2	Attitude to management and manpower	0.070	1	-	-	-	-	-	-
3	Attitude to financial affairs	0.510**	-0.003	1	-	-	-	-	-
		0.001	0.970						
4	Attitude to market and competitiveness	-0.180	-0.112	-0.007	1	-	-	-	-
		0.280	0.520	0.970					
5	Attitude to government policies	-0.240	-0.320	-0.47**	0.160	1	-	-	-
		0.150	0.060	0.004	0.360				
6	Yield	0.280	-0.280	0.520**	-0.370	-0.120	1	-	-
		0.0950	0.090	0.001	0.830	0.480			
7	Academic education	0.0150	0.570**	-0.130	-0.205	-0.105	-0.370*	1	-
		0.930	0.000	0.440	0.230	0.540	0.030		
8	Background	0.360*	0.310	0.580**	0.065	-0.350*	0.470**	0.330**	1
		0.030	0.060	0.000	0.700	0.037	0.004	0.048	

*p ≤ 0.05; **p ≤ 0.01.

legislation in 2008, be given late repayment penalties loans shrimp, so that, be an incentive to non-actives units on the one hand and be a strategy towards sustainable development in the shrimp industry on the other hand.

Results regarding to rank of managers' attitude to management and manpower showed "Employ of permanent employee, increase the margin", "Academic education increase productivity and efficiency" and "Management is the pillar of production" achieved the most agreement. While the two items "Guatr shrimp farms have less comparative productivity" and "Employ of Journeyman reduce variable costs" is expressed as the

most disagreement. Improving manpower productivity is one way to reduce the gap of shrimp industry productivity of Iran to the most shrimp exporters. There fore, it is recommended for conducting training courses to improve manpower productivity in Guatr restrict by Department of Cooperatives and Fisheries Organization.

Regarding the rank of financial affairs, "Managers' have sufficient knowledge about turnover" and "Related organizations have acceptable cooperation with shrimp farm to improve their efficiency" achieved the most agreement, while, the items of "All of the loans that has been paid by government was invested at the shrimp

farms" is allocated the most disagreement. These ranking distinguish that the supervision of government on financial affairs should be increased regarding the high cost of production, including food costs - mostly imported - and lack of access to technology, such as aeration systems in the fields. Overall, Sanchez and Muir (2003) concluded that having access to technology has important ecological and economical dimensions. They expressed having access to technology acquired highly significant the level of agreement in aquaculture development.

Regarding the results about ranking of market and competitiveness, it is recommended for creating domestic market by the assistance of government so that it improves the state of producers on the one hand and increases per capita shrimp consumption in the country on the other hand. To maintain and even expand competitive global markets, it is suggested boosting the status of the road infrastructure at the restrict of non-residential and remote Guatr as well as current aid subsidies to exporters - shrimp exports, so that by using this way, it is reduced the cost of shrimp. Inappropriate market conditions and non-optimal allocation financial resources are the major obstacles of developing in these farms. The problems should be solved via low-interest loans and propagation of increasing shrimp consumption.

The results of managers' attitude toward government policies showed "Allocated credits and incentives to shrimp units were not effective enough to improve their activities" is achieved the less disagreement. Therefore, recent incentives and credits cannot satisfy managers. They need more credits for this industry. In this direction, government agencies should motivate them to improve production process by giving award and credit for a specific and the expected level of production.

The results of Mann-Whitney test indicated that there is a significant difference between cooperatives and non-cooperative in relation to financial affairs, so that attitude of non-cooperative was more favorable than cooperative farms. It can be the consequences of better status in financial affairs. Moreover, there was a significant difference between these units in regard to market and competitiveness. It may be the consecution of dissimilar structure of cooperative such as participation and the number of members. However, these indifferences can be positive so that it can help with improving and growth of shrimp's industry.

The results of Kruskal-Wallis test expressed that the attitudes toward "cooperation and cooperatives", "financial affairs" and "market and competitiveness" is affected by supervision. It is concluded that more accurate monitoring of the farms can lead to improve the financial affairs.

The results of correlation's table showed that there is a positive correlation between backgrounds and cooperative, financial affair as well as governments' policy. So that, more experience led to improve attitudes toward these indexes.

Education significantly had a positive relation toward management and human resources. However, unexpectedly, there was a reverse relation between education and yield.

"Managers' attitude toward financial affairs" had a significant relation to "managers' attitude toward cooperative". There was significantly a relation between "managers' attitude toward government policies" and "managers' attitude toward financial affairs". Furthermore, "manager attitude toward management and manpower" had a significant relation with "academic education and academic education". Moreover, the variable of "background" significantly had a relation with "manager attitude toward cooperative", "manager attitude toward financial affairs", "manager attitude toward government policies", and finally "academic education. Considering population and managers characteristics, the fewer yields of educated managers' farms was the consequence of less their experience. Comparing the level of correlation between the yields on the one hand, and education as well as experience on the other hand, it can be concluded that experience is more important than education. Therefore, as Baticados (2004) mentioned, conducting courses alongside transferring experiments to new investors is suggested.

REFERENCES

- Baticados DB, Agbayania RF, Gentalb FE (1998). Fishing cooperatives in Capiz, central Philippines: their importance in managing fishery resources.
- Baticados DB, Agbayania RF, Gentalb FE (2004). Fishing cooperatives' participation in managing nearshore resources: the case in Capiz, central Philippines. *Fish. Res.*, 67(1): 81-91.
- Chu J, Anderson JL, Asche F, Tudur L (2010). Stakeholders' Perceptions of Aquaculture and Implications for its Future: A Comparison of the U.S.A. and Norway. *Mar. Resour. Econ.*, 25: 61-76.
- Galvão AKDL, Brandão TB, Júnior SM (2005). Environmental management and Competitiveness: A Survey on Environmental Awareness in Shrimp Producers in the State of Rio Grande do Norte in Brazil. *Brazilian J. Oper. Prod. Manage.*, 2 (2): 75-86.
- Hewitt CL, Campbell ML, Gollasch S (2006). Alien Species in Aquaculture: Considerations for Responsible Use, Global Marine Programme, The World Conservation Union.
- Heberlein TA, Wilson MA, Bishop RC, Schaeffer NC (2005). Rethinking the scope test as a criterion for validity in contingent valuation. *J. Environ. Econ. Manage.*, 50(1): 1-22.
- Pjez-Osuna F (2001). The environmental impact of shrimp aquaculture: a global perspective. *Environmental pollution.*, Elsevier.
- Primavera JH (1997). Socio-economic impacts of shrimp culture-Aquaculture Research.
- Salehi H (2010). The economic impacts of WSSV on shrimp farming production and export in Iran, *Aquatic animal health*, April-June 2010; 5: 2.
- Robertson RA, Carlsen EL (2001). Effect of Balanced Information Attitudes towards Open Ocean Aquaculture Development in New England. University of New Hampshire Durham NH 03824. Available on "<http://nrs.fs.fed.us/pubs/>".
- Sanchez E, Muir JF (2003). Fishermen perception on resources management and aquaculture development in the mecoacan estuary, tabasco, mexico. *Ocean Coast. Manag.*, 46: 681-700.
- Sinchpanich C, Prachongsak (1999). Assessment of perception and attitude of local resident on the DOF project on result demonstration on aquaculture: Case study at Mahasarakarm province. Published in

- International Information System for the Agricultural Sciences and Technology.
- Subasinghe RP, Arthur JR, Phillips MJ, Reantaso MB (1999). Thematic review on management strategies for major diseases in shrimp aquaculture. A Report Prepared for the World Bank, Network of Aquaculture Centers in Asia-Pacific, World Wildlife Fund and Food and Agriculture Organization of the United Nations. Consortium Program on Shrimp Farming and the Environment.
- Whitmarsh D, Wattage P (2006). Public Attitudes towards the environmental impact of Salmon aquaculture in Scotland. *Eur. Environ.*, 16: 108-121.