

FISH-CULTURE PRODUCTION ECONOMICS IN NORTH-WEST OF IRAN

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ABSTRACT

Whatever the quantity and the rate of water utilization is, economic principles indicate that there will always be other water utilization methods which might increase the efficiency of the use of this resource. Due to the geo-climatic position of Iran, this country finds itself in a water deficit situation as compared to per capita use rates observed in the rest of the world. The scarcity of water has always been a serious, at times disastrous, problem in Iran, and this problem will likely get worse in the future. Thus, the most rational possible water resource utilization will be a permanent preoccupation of the nation, and therefore the government. One still less examined method of rationalizing water utilization in Iran is the multi-dimensional utilization of water, where fish culture takes place jointly with other previously adopted agricultural enterprises. The main question considered in this article is that of water productivity, ie. how economically do we use water in fish culture activities? The results of statistical analyses of our field research, based on questionnaire completion of a significant sample of fish-farming enterprises, reveal the fact that Iran could still improve water utilization productivity rates in these enterprises. However, wide variation in water productivity is observed. On the base of some better-operated enterprises extension proposals and policy recommendations could be made.

Keywords: fish, production, economics, Iran

INTRODUCTION

The main purpose and importance of this work lies within the holistic view of present Iranian socio-economic and perhaps political; circumstances. Where due to the geo-climatic position of Iran; in accordance with some economic principles there would always be another water utilization methods open to the economy where still there is space to increase its efficiency rate in the economy as a whole. In global comparison of average per head water resource availability, this country is relatively in water-deficit circumstances. Here, with access to 1333 cubic meter of total water per head per year, the average person has access to only 15% of world per capita per annum water access.(FAO) The scarcity of water has always been a serious issue in Iran and some times disastrous and this would be more so towards to the future. Thus the most rational water utilization would be the permanent pre-occupations of both nation and thereby the governments. One, still less examined methods of more rational water utilization method in Iran is the muti-dimentional and multi-purpose utilization of water; where the joint fish-culturing with other previously adopted agricultural enterprises come to the economic scene. Little access were to extensive literature about the case but of few articles reviewed; it reveals that; there exists extensive capacities in devising better utilization of limited water resources.

STUDY SITE

To understand the effects of field circumstances on research results, it is useful to know that this field works were carried on 66 fish-culturing villages of 32 townships, of 25 counties, of three provinces of north-west of Iran in middle east of Asia. Where environmental circumstances are mainly semi- and arid kinds with urgent water deficits. Out of average annual precipitation of 413000 million cubic meters(MCM) in 1.65 million kilometers of the surface of the country, the renewable water is about 130000(MCM) out of which some 105000(MCM) is surface water the other 25000(MCM) is ground water. Internal renewable water resources per capita of 2254 cubic meter in 1988 is to that of 1915 in 1997. With irritating rates of desertification, and alarming rates of decline in bio-diversity levels. Due to

the extensive long-standing existence of red meat consumption preferences within consumers and the rapid urbanization rate of 47% in 1976 towards that of 70% in 2000, this location envisages with over-grazing and thereby this site has some drastic soil erosion and pasture degradation problems. Furthermore, although food production per capita from 1980 to 1997 increased by 37%, within which daily per capita supply of calorie rose from 2612 kcal per day to that of 3415 kcal per day. Daily per capita supply of protein rose from 70 gr to 87 gr. Average annual per capita meats and eggs consumption from 45 kg of 1990s to that of 50 kg in 2000. In due course, total fish catch and produce increased from 235 thousand tons to 400 thousand tones, still there exist some rates of shortcomings in micro-nutrients and in the optimal composition of food items, thus increasingly it appears some mal-nutrition-based and other serious food-based diseases, which has drawn the concern of nutrition authorities of the country. With some basic development indices of gdp per capita of 1985 ppp\$ in 1960s towards 5222 ppp\$ in 1990s with annual growth rate of around 5%, of life expectancy of 50 years in 1960s towards 70 years of 2000s. With annual private consumption growth rate of 4%, and with educational enrolment ratio of 46% in 1980s towards 75% of 2000s; the country is reasonably paving the path of economic, social and trade development. In 1996, the values of HDI, GDI, GIM and HPI are 0.719, 0.542, 0.229 and 2.9 respectively.

METHOD OF STUDY

Considering the main theme of this research, the question of water productivity; i.e. how economic do we utilize the water in agriculture, including the supplementary economic activity of fish-culturing, and the fact that systematic approach would be a proper method of research; then the level of utilized water in total fish production system as an input and the level of produced fish as an output should appropriately measured in significant number of fish culture units. Thus an on-field research works based on the face to face questionnaire completion with population of managers of fish-farming enterprises of the whole aforementioned site was employed.

RESULTS

The descriptive results show special fish-culturing units, production and producers characteristics as follows. 68% of them have started their activity during 1990s and the other 20% in 2000s. On average the distance between the sites and city center is 21 Km. Table annex-1 shows fish-culturing units specifications details, where every fish culturing sites on average holds 82000 meter of land of which 32000 meter are used in production process. 89% are of cold-water-trout types, the other 10% are of warm-water-carp types; the other 1% of mixed types. In whole production systems on average they have access to 64.6 liters/second of water (with standard deviation of 88) in any production periods. In 98% of the production units water is semi-salty, in 1% it is slightly salty in other 1% it is salty. For 41% of them the water source is wells, for 27% some natural sources of kariz type, for 11% river streams, for 2% dams, and for some other 18% the different mixes of above-mentioned sources of water. Some 96% of them are of open type and other 4% are of closed systems. In trout systems on average they use some 29000 fish larva per every production period. And in other systems on average they use 17000 fish larva in any production process. 87% of them possess concrete pools; 3% clay ponds and the other 9% use dams. Table 1-annex also shows the production characteristics details where, any fish culturing production process systems on average produces 6257 kg of fish(with standard deviation of 9192) which on average is sold to 16400 Ir.Rials per kilos(with standard deviation of 3869) producing 106 million Ir Rials of nominal incomes(with standard deviation of 161). Thus table 1-annex also shows the producers characteristics details, where any producer on average has 6.15 years of work experience, 5.84 days of participation in extension classes, 26% of them holds diploma and other 26% has passed primary schools, but as little as 10.25% of them holds university degrees. And for 68% of them the fish-culturing is their main jobs and for another 32% this activity is of marginal types.

The results of statistical analyses of an on-field research works based on questionnaire completion from the population of fish-farming enterprises shows the rate of return of fish per liter per second of water is 296 kg of fish in average production period (with standard deviation of 933); and of the rate of return of nominal income per liter per second of water is 4.4 million IrRials (with standard deviation of 14). Correlation coefficient between the rates of water availability with that of price, production and that of nominal income rate is 0.54, 0.476 and 0.325. all of them significant at 1% level. Multivariate regression analyses between dependent variable of nominal income and independent variable of water availability, production rate and price levels produced regression coefficient of 0.05, 0.914 and 0.181 respectively; except that of water all of the other coefficient significant and with all statistics of t, r, DW, and F acceptable. Considering overall statistical criteria especially those of widely scattered standard deviation as compared with those of production outlets and that of small and yet insignificant water usage coefficients; have revealed the facts that still the nation could improve their water utilization productivity rates in these supplementary enterprises.

DISCUSSIONS

The simultaneous and comparative consideration of: a) main question of this article of water productivity in fish-culturing enterprises of north-west of Iran; b) the descriptive results of fish-culturing units, production and producers characteristics; and c) the results of statistical analyses of an on-field research works based on questionnaire completion of population of fish-farming enterprises show the following most valuable, new creative syntheses, at least in this site, which are to establish basic principles if and if one is serious to augment the future performance of this enterprise in Iran.

The comparative results of this research between few best-operated fish-farming units and few worst-operated ones; shows that with respect to water utilization efficiency the well operated farms are within well-aged men between 50-60 years of age. They are mainly well-educated and some holding Bsc. They have longest presence in wide extension classes. They hold this enterprise as their main occupation and at least they have 10 years of relevant production experience. Their location are closer to provincial, county and consequently to market centers. They are intelligent and clever in market and they are more proficient in marketing practices. They utilize the enterprise with their full capacity (they do not let their enterprise with excess capacity) and also use the larva(baby-fish) more extensively. They are mainly within cold-water of better quality-trout system, their water sources are a mixture of any type, and its quality is in its highest situations. Their husbandry systems are mainly concrete pools of closed types with persistent production periods, the most nurture period is around 300 days. Thus, to improve the arrangement of this enterprise in the studied site, in accordance with the results of this study, one could prepare some extensionist proposals, plans and the like. There is a serious potentials to enlarge and develop more extensive research in these enterprises.

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Table:1-Summary of descriptive results of fish-products consumption economics

Order	Variable description	Unit	Distribution criteria			Other criteria							
			Fresh south catch	Fresh north catch	Fresh River catch	Farm warm fish	Farm cold fish	Frozen south catch	Frozen north catch	Frozen River catch	frozen farm warm fish	frozen Farm cold fish	ton
1	Proportion of fish consumers	%	89			-							
2	Proportion of given fish consumers	kind	Fresh south catch	Fresh north catch	Fresh River catch	Farm warm fish	Farm cold fish	Frozen south catch	Frozen north catch	Frozen River catch	frozen farm warm fish	frozen Farm cold fish	ton

		%	6	15	29	49	22	5	3	1	4	0.5	56
3	Consum.. time period norms	Once In any	day	week	month	season		year		Occasional		Do not remember	
		%	0.5	36	34	8		3		15		0.1	
4	years of fish consumpti experience	criteria	min			average			max				
		%	0			17			72				
5	Quantity consumption norm;fsc	kg	0			1.2			30				
6	Quantity consumpti norm;fff	kg	0			1.61			50				
7	Quantity consumpti norm;frzsf	Kg	0			0.33			45				
8	Quantity consumpti norm;frzff	Kg	0			0.14			25				
9	Quantity consumpti norm;tonn	No.	0			3.3			300				
10	Quantity consumpti norm other	Kg	0			0.15			30				
11	Source of supply	name	chains	specialists	Fish market			coop	jumboos	Chikhen& fish stors	producers	Ready meals	
		%	14	2	26			9	8	28	15	0.5	