

COMPARATIVE SOCIO-ECONOMIC ASSESSMENT OF MEN AND WOMEN AQUAPRENEURS

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ABSTRACT

West Bengal is a state blessed with plenty of water resources, the majority of which are still untapped. In this regard, the government of West Bengal has developed a fisheries investment policy and also promoted various entrepreneurship development schemes to involve more actors in the aquaculture value chain. To initiate an all-round development of a sector first we need to know the status of development of the recipients of the sector. Aquapreneurs are the key recipients of the aquaculture sector. In this era of equality and equity, the government is promoting both the men and women aquapreneurs. Henceforth, to understand the status of development among the men and women aquapreneurs the present study was conducted. The study was conducted in three districts namely Murshidabad, Nadia, and North 24 Parganas due to their high fish production and concentration of a greater number of women aquapreneurs. Purposive convenience sampling and snowball sampling were used to select 245 respondents comprising 170 men aquapreneurs and 75 women aquapreneurs. The findings of the study indicated that the majority of the men aquapreneurs belonged to the middle age category (41-60 yrs.) whereas women aquapreneurs were mostly in the young age category (21-40 years). The men aquapreneurs had a higher educational qualification, total area holding, and social participation as compared to women aquapreneurs. The socio-economic determinants affecting income were found to be total area holding, educational qualification, and social participation in the case of men aquapreneurs, however, in the case of women it was only experience. The findings of the study indicate that women aquapreneurs are at their initial stages of development and are in a disadvantaged position in many indicators concerning men aquapreneurs. The study suggests women targeted approaches need to be implemented by the government to promote and boost women entrepreneurs.

Keywords: socio-economic profile, aquapreneurs, income, aquapreneurship

INTRODUCTION

Aquaculture is the fastest growing animal-production industry with hundreds of billion-dollar industries worldwide contributing significantly to food and nutritional security, and agricultural exports as well, and is engaging about fourteen million people in different activities (FAO, 2016). Aquapreneurship is a viable and promising venture for the next generation of entrepreneurs concerning livelihood, profitability, and sustainability (Dey and Nanda, 2020). India tops the inland fish production and is the second largest aquaculture nation in the world (FAO, IFAD, UNICEF, WFP and WHO., 2021). The total fish production during 2021-22 is at 16.24 million metric tonnes (MMT) with a contribution of 12.12 MMT from the inland sector and 4.12 MMT from the marine sector (DoF, 2022). Among the different states of India West Bengal is the fastest growing state in fish production

after Andhra Pradesh. Keeping pace with the growth of Indian fisheries West Bengal has made considerable progress in the field of fish seed production, fish culture, and capture. The state accounted for 13% of the country's total fish production at 17.82 lakh metric tons in 2019-20 (DoF, 2021) and total exports of marine products were \$ 695.84 million implying 8.83% of the total marine products exports from India (MPEDA, 2021). West Bengal has a lot of untapped and hitherto potential fisheries resources that need to be explored and harnessed to utilize them effectively and efficiently. Aquapreneurship is at a proliferating stage with regards to men while women aquapreneurship is still at a growing and nascent stage in the state. Furthermore, the government of West Bengal is promoting several entrepreneurship development schemes such as RMRC (Rangeen Mach Rangeen Chas), Jol Dhoro Jol Bhoro (JDJB), etc., to attract a greater number of entrepreneurs in the aquaculture sector

(DoF, 2014-15). Women are merely engaged in low-income areas of fishing activities and men dominate the fisheries sector in the state (Nandy, 2023). The existing literature in the area of socio-economic status merely focuses specifically on men fish farmers (Rahaman *et al.*, 2022; Majhi, 2020; Bera and Maity, 2023) and a rare literature exists on women fish farmers. However, the proliferation of aquapreneurship schemes by the government has resulted in increased participation of men and women entrepreneurs, which calls for an assessment of their status of development and suggesting suitable measures for their further prosperity in the field of aquapreneurship. Furthermore, merely any literature on comparative assessment of men and women aquapreneurs were found and this proves the need and impetus for the study with the below mentioned objectives:

OBJECTIVES

- (1) To conduct a comparative analysis of the various parameters of socio-economic profile of the men and women aquapreneurs.
- (2) To identify the determinants affecting their income for suggesting suitable measures for promoting aquapreneurship development.

Comparative socio-economic profile information

Table 1 : Comparative socio-economic profile information of men and women aquapreneurs

(n=245)

Sr. No.	Variables	Men			Women		
		Frequency	Percentage	Mean	Frequency	Percentage	Mean
1	Age (Yrs)			45			35
	21-40	60	35.29		67	89.33	
	41-60	96	56.47		8	10.67	
	> 60	14	08.24		0	0	
2	Family size (no.)			6			5
	Small (≤ 5)	116	68.24		46	61.33	
	Medium (6-10)	43	25.29		29	38.67	
	Large (≥ 10)	11	06.47		0	0	
3	Family type						
	Nuclear	119	70.00		49	65.33	
	Joint	51	30.00		26	34.67	
4	Educational Qualification						
	Primary	46	27.06		17	22.67	
	Middle Level	36	21.18		29	38.67	
	Secondary	52	30.59		20	26.67	
	Higher Secondary	21	12.35		09	12.00	
	Graduate	11	06.47		0	0	
	Post Graduate	04	02.35		0	0	
5	Religion						
	Hindu	158	92.94		25	33.33	
	Muslim	12	07.06		50	66.67	

METHODOLOGY

The present study was conducted in three selected districts of West Bengal namely Murshidabad, Nadia, and North 24 Parganas due to their higher fish production and possession of a higher number of women aquapreneurs as compared to other districts of the state. Purposive convenience sampling technique and snowball sampling was employed to identify the men and women aquapreneurs. A total of 245 respondents were selected comprising 170 men and 75 women aquapreneurs. A structured interview schedule was used for the collection of data regarding the socio-economic variables. The data were analyzed using descriptive statistics, frequency analysis, and mean. Multiple regression analysis was employed to identify the socio-economic determinants of net monthly income.

RESULTS AND DISCUSSION

Socio-economic indicators are closely interrelated and are crucial for analyzing the status of a person involved in a particular farming system. Moreover, a particular indicator alone cannot reflect the status of a person. Henceforth, in the present study efforts have been made to study the socio-economic profile and the determinants affecting their income for both men and women aquapreneurs. It has been summarized and explained in the succeeding paragraphs.

Sr. No.	Variables	Men			Women		
		Frequency	Percentage	Mean	Frequency	Percentage	Mean
6	Marital Status						
	Single	10	05.88		0	0	
	Married	160	94.11		70	93.33	
	Widowed	0	0		05	06.67	
7	Total Area Holding (Ha)			1.45			0.04
	Landless(0.00 ha)	0	0		0	0	
	Marginal (0.1-1ha)	70	41.18		75	100.00	
	Small (1.01-2.00 ha)	77	45.29		0	0	
	Semi-medium (2.01-4.00 ha)	21	12.35		0	0	
	Medium (4.01-10.00 ha)	02	01.18		0	0	
	Large (> 10 ha)	0	0		0	0	
8	Land Ownership						
	Leased	34	20		63	84.00	
	Owned	136	80		12	16.00	
9	Social Participation						
	Not a member	60	35.29		13	17.33	
	Member of any association	92	54.12		62	82.67	
	Chair person	18	10.59		0	0	
10	Monthly income (₹ In lakhs)			1.98			0.08
	Low (< ₹ 50,000)	0	0		75	100.00	
	Medium (₹ 50,000-2.5 lakhs)	136	80		0	0	
	Semi- medium (2.51 lakhs-5.0 lakhs)	25	14.71		0	0	
	High (>5.0 lakhs)	09	5.29		0	0	
11	Extension Contact						
	DOF	09	05.29		0	0	
	KVK	35	20.59		0	0	
	Fisheries Institutes	18	10.59		0	0	
	Cooperatives/ SHG	09	05.29		71	94.67	
	All the above	99	58.24		04	05.33	
12	Experience (Yrs)			10.45			2.77
	0-5	34	20.00		70	93.33	
	5-10	51	30.00		05	06.67	
	10-15	67	39.41		0	0	
	>15 years	18	10.58		0	0	

(1) Age

The results of the study indicated that the majority (56.47%) of the men aquapreneurs were in the middle age group of 41-60 years followed by the young age group (35.49%) of 21- 40 years and only 8.24% out of the total respondents were from the old age group of more than 60 years which indicates active participation of the young and middle-aged group in aquapreneurship business. Aquapreneurship is a lucrative business and encompasses high incomes and good

profit margins as a result it attracts young and middle-aged group people for establishing the venture (Ifejika *et al.*, 2015). The results of the study are in concordance with the studies conducted by Omeje *et al.*, 2021, Tripathy *et al.*, 2023 and Sen and Roy (2015) who also concluded that the majority of the fish farmers belong to the young and middle age group. The average age of the men aquapreneurs was found to be 45 years ranging from a minimum of 23 years to a maximum of 62 years.

However, the scenario for women aquapreneurs showed a little deviance from the men aquapreneurs. Women aquapreneurs constituted a majority (89.33%) of young age (21-40yrs) group members followed by 10.67% of the middle-aged group members (41-60 yrs.). The results correspond to the study conducted by Bhenderkaret *et al.*, 2017 which also depicted the fisherwomen of the young and middle age group are mostly involved in the fish business. The average age of women aquapreneurs was found to be 35 ranging from a minimum of 21 years to a maximum of 42 years.

(2) Family size

The majority (68.24%) of the men aquapreneurs belong to the small (≤ 5 members) family category followed by 25.29% in the medium category (6-10 members) and only 6.47% among them belonged to the large (≥ 10 members) family category as depicted in table 1. The study results are similar to the studies conducted by Omejeet *et al.*, 2021, Ukpe *et al.* (2017), Ogunmefun and Achike (2017), and Shitote *et al.* (2013) who also revealed that the household size of the fish farmers is mostly 1-5 persons followed by 6-10 persons. Moreover, the results of the women aquapreneurs also followed a similar trend as men. In the case of women also, the majority (61.33%) of them belonged to the small family category followed by 38.67% belonging to the medium category which follows a similar trend to the study conducted by Bhenderkaret *et al.*, 2017 revealing similar figures with regards to family size for fisherwomen.

(3) Family type

The results of the study indicated that the majority (70%) of the men aquapreneurs were from a nuclear family background followed by 30% belonging to the joint family category which follows the similar trend revealed in the study by Hossain *et al.* (2015). Moreover, similar trends were observed in the case of women aquapreneurs where 65.33% of them belong to the nuclear family followed by 38.67% belonging to the joint family category. Furthermore, the study conducted by Bhenderkaret *et al.*, 2017 on the assessment of entrepreneurship behavior in the Ratnagiri district also revealed similar results for fisherwomen.

(4) Educational qualification

Educational qualification plays a significant role in the socio-economic enhancement of an individual. The majority of the men aquapreneur had a secondary level (30.59%) of education followed by primary (27.06%) and middle-level education (21.18 %) whereas a few (8.82%) also belonged to graduate and post-graduate categories. This signifies that most of the respondents attained at least

a primary level of education and a few of them also had a higher educational status which will help them in improving and expanding their ventures inculcating the modern-day technologies in aquaculture. The studies conducted by several authors like Omejeet *et al.*, 2021, Agboola (2011), Ayelojaet *et al.*, 2021; Vinaya *et al.* (2022), also revealed a similar pattern of education among the fish farmers depicting that majority of them had secondary or tertiary levels of education. However, in the case of women aquapreneurs the pattern of education differed slightly representing the majority in the middle-level education (38.67%) followed by 26.67% in the secondary level of education and 22.67% in the primary level of education. Only a few (12%) had a higher secondary level of education but none of them had a graduate or post-graduate level of education. The results of the study are in concordance with the study of Bhenderkaret *et al.*, 2017 who also revealed that the majority of the fisherwomen possess the primary and secondary levels of education with a few belongings to higher secondary levels. They also revealed that a major share of 31% of the fisherwomen was illiterate whereas in the case of the present study all the respondents were found to be literate and so they were eager to learn more advanced aquaculture technologies to expand their venture and run it effectively.

(5) Religion

The majority (92.94%) of the men aquapreneurs were Hindus, and only a few (7.06%) were Muslims due to the reason that the study areas selected had a majority of Hindu population except Murshidabad which is a Muslim dominant district. Similar trends were observed by Ray (2017) in a study conducted on the socio-economic aspects of fish farmers of Howrah, West Bengal. Furthermore, in the case of women aquapreneurs the trend was the opposite and the majority of the respondents belong to the Muslim (66.67%) category followed by 33.33% belonging to the Hindu category. The reason for such trends can be attributed to the fact that Muslim men households migrate to other states in search of labor-intensive jobs which fetches them a low salary. In this regard, it becomes difficult for the women households to bear the monthly family expenses and as a result, they are much more eager to establish aqua enterprises that fetch some amount of money that helps in bearing the family expenses rather than depending on their husbands to for meeting family and personal expenses.

(6) Marital status

The majority of the men aquapreneurs in the study area were found to be married (94.11%) and only 5.88% were found to be single, which depicts similar results to the study conducted by Omejeet *et al.*, 2021 and Olaoyeet *et al.*, 2013.

Furthermore, Fakoya(2000) and Oladoja *et al.*, 2008 asserted that marriage awakens some level of responsibility and commitment in individuals. In the case of women aquapreneurs also the share of married people was more (93.33%) followed by 6.67% belonging to the widowed category. Bhenderkaret *et al.*, 2017 also revealed that fisherwomen mainly belong to the married and widowed category.

(7) Total area holding

The majority (45.29%) of the men aquapreneurs belonged to the small aquapreneur category with an area holding of 1.01- 2.00 ha, followed by the marginal (41.18%) and semi-medium category (12.35%) with an area holding of 0.1 – 1.0 ha and 2.01 – 4.00 ha respectively. Only 1.18% of the respondents belonged to the medium category with an area holding of 4.01 – 10.0 ha and none of them were in the large (> 10 ha) category. The average area of holding was found to be 1.45 ha for men aquapreneurs which is higher than the marginal category. Ahmed and Rab (1993) in their study conducted in Bangladesh also revealed that fish farmers mostly comprise small and medium categories. However, it was observed all the women aquapreneurs belonged to the marginal category with an area holding of 0.1 -1.0 ha with an average area of 0.04 ha since women aquapreneurs are at their initial stages of developing their enterprises whereas men aquapreneurs are involved in this venture for a much longer time as compared to them. Ahmed *et al.* (2018) also revealed that women have a lesser landholding compared to men due to the prevailing patrilineal system in society.

(8) Land ownership pattern

Men aquapreneurs mostly (80%) had their own land followed by 20% practicing aquapreneurship on leased land. Similar findings were attributed by Olaoye *et al.* (2013). However, the scenario for women aquapreneurs was reverse, as the majority (84%) of them was practicing aquapreneurship in leased pond and only 16% of them had owned land. Among them, 60% women aquapreneurs has taken the lease in the name of their husbands as taking lease in the name of women is still difficult in the present-day scenario. Shelly and Costa (2002) also revealed that land ownership control is mainly dominated by men and women remains in a disadvantaged position with regards to ownership.

(9) Social participation

Majority (54.12 %) of the men aquapreneurs were found to be a member of any public/ community organisation like cooperatives, gram panchayats, etc., and also some (10.59%) of them was chairperson of such organisations which implies they had a higher level of social participation. However, a study conducted by Sen and Roy (2015)

revealed a different trend with regards to social participation depicting fish farmers have very low social participation and stays detached from organised social activities. These may be attributed to the reason that the respondents in the present study had higher level of education and extension agent contact which has resulted in improving their social participation to a greater extent. Furthermore, the majority (82.67%) of the women aquapreneurs were members of SHGs and 17.33% among them were found to be a non-member of any such associations. Bhenderkaret *et al.*, 2017 also revealed similar results with 60% fisherwomen being member and 40% of them belonged to the non-member category. The women aquapreneurs were only involved in SHGs as majority of them have started their venture through assistance from SHGs. None of the women aquapreneurs were found to be chairperson in other community organisations like cooperatives, gram panchayats, etc., as they are all men dominated positions and are run by them.

(10) Monthly income distribution pattern

Income is a very crucial indicator contributing towards standard of living and all other indicators affecting towards the wellbeing. In the present study, almost 80% of the men aquapreneurs belonged to medium income category (₹ 50,000 – 2.5 lakhs) followed by 14.71% in the semi-medium category (₹ 2.51 -5.0 lakhs) and only 5.29 % of them belonged to the high-income category (> ₹ 5.0 lakhs) with an average monthly income of ₹ 1.98 lakhs. Studies conducted by Sen and Roy (2015), Ray (2017), Hossain *et al.*, 2015, Vijaykumar *et al.*, 2019 also depicted similar results implying that fish farmers mostly belong to the medium income category with few in a large income category. Henceforth, it can be opined the aquapreneurship is a profitable venture and can have good returns upon its investment. In case of women aquapreneurs, the income distribution pattern showed a very low trend with an average monthly income of ₹ 8,300 due to the fact that they are new to the business and the area holdings are very less for them. Less area holding attributes to less production and in turn less income and profits. However, Bhenderkaret *et al.*, 2017 depicted a slightly different result with majority of women in medium and low-income category while a few in the high-income category, which may be due to more area holding of the women in the study area.

(11) Extension contact

Extension contact plays a very crucial role for holistic development of an aquapreneur as they facilitate them with latest information related to technologies, schemes, programs, etc., which indeed will help them in expanding and renovating their business in an effective way. Majority (58.24%) of the men aquapreneurs were found

to have contact with all the extension agents and agencies available in the district like, DoF, KVK, Fisheries research institutes or SAUs, cooperatives, which is in similar lines with inference drawn from Dutta *et al.*, 2019 about extension contact for fishing. However, it was observed that women aquapreneurs had only contact with the cooperatives/ SHG personnel and only 5.33% of the respondent had extension contact with all the extension agents and agencies. The women aquapreneurs has started their venture through SHGs and get assistances with regards to business from them, as a result they have a good rapport with them. The department officials mostly conduct trainings or field visits which are attended by men aquapreneurs as a result women remains behind with regards to having extension contact with them. Several studies conducted by Roy *et al.* (2015), Nagarajiah (2002), Bhargavi *et al.* (2020) on socio economic status of fisherwomen revealed similar results stating that women have low extension contact due to lack of women targeted programmes and due to prevalence of more men extension officers with which women are not flexible to interact always.

(12) Experience

Men aquapreneurs were found to have a good amount of experience in their occupation with an average experience of 10.5 years approximately. Majority (39.41%) of the men aquapreneurs had 10-15 years of occupational experience followed by 30% having 5-10 years of experience. Studies conducted by Ayeloja *et al.*, 2021, Omejeet *et al.*, 2021, Olaoye *et al.*, 2013 also revealed the similar results inferring that majority of the fish farmers bears a good experience ranging from 5-15 years. However, in case of women aquapreneur the trend was reverse and majority (93.33%) of them had 0-5 years of experience because women aquapreneurship is at the initial stages of development in the fisheries sector as a whole. Rekha (2018) also revealed similar findings depicting fisher women mostly have 1-5 years of experience.

Socio-economic determinants of net monthly income for men aquapreneurs

Income is a major indicator contributing towards socio-economic development of a person. Henceforth, to identify the socio-economic determinants affecting the income of the men aquapreneurs, multiple regression analysis was employed. Firstly, the variable total area holding was found to be significant at 1% level of significance. It signifies that with increase in the area holding there will be a proportionate increase in income of the men aquapreneurs. Secondly, educational qualification was found to be significant at 10% level of significance. It implies that with the increase in the level of education there will be a rise in the income which may be attributed to the fact that increase in education will

lead to grasping of new knowledge and technologies which indeed will lead to expansion of the business and fetch a high amount of income. Thirdly, social participation was found to be significant at 10% level of significance which denotes that with an increase in the social participation among the aquapreneurs there will be an increase in the income of them. The reason behind this may be attributed to the fact that increase in social participation would result in development of networks and connections which indeed will lead to expansion of business and lead to increase in the income of the respondents. Some studies conducted on identifying socio-economic determinants of income reflected age (Omejeet *et al.*, 2021; Ngeywoet *et al.*, 2015), experience (Omejeet *et al.*, 2021; Zongliet *et al.*, 2017; Adeosun *et al.*, 2019; Nyamasoka *et al.*, 2024; Anand *et al.*, 2024; Thako and Joshi, 2022), house hold size (Ifejika, 2013) were the significant factors affecting the net income of the respondents. The other variables like age, extension contact, experience was found to be non-significant. The Adj R-squared was 0.611 which means that the variables included in the model were able to influence the variation of the dependent by 61.11 % while the significance of F-statistic shows that the independent variables collectively influenced the variation of the dependent variable. The R- square value 0.61 which shows that the model is a good fit as the value is more than 0.5.

Table 2: Socio-economic determinants of net monthly income for men aquapreneurs (n=245)

Variables	Coefficients	t value	Sig.
Constant	0.405	3.030	0.003*
Total area holding	1.302	16.325	0.000*
Age	0.78	1.608	0.110
Educational qualification	0.86	1.769	0.079**
Social participation	0.082	1.715	0.088**
Extension contact	0.058	1.204	0.230
Experience	0.045	0.948	0.345
Model summary			
R-squared	0.613		
Adj. R-squared	0.611		
F- Statistic	266.518		
Prob>F	0.000*		

Note: * Significant at 1% level of significance and ** significant at 10% level of significance.

Socio-economic determinants of net monthly income for women aquapreneurs

The results of the multiple regression analysis employed to identify the socio-economic determinants of monthly income is presented in table 3. The results of the study indicated that only experience was found to be a significant variable affecting the monthly income of the

women aquapreneurs. It signifies that with increase in years of experience there will be significant rise in the income of the respondents. The finding is similar with the findings of the study conducted by Omejeet *et al.*, 2021; Zongliet *et al.*, 2017; Adeosun *et al.*, 2019 who also indicated that income is significantly affected by experience in the occupation. All the other variables included like age, educational qualification, social participation, etc., were found to be non-significant. The Adj R-squared was 0.511 which means that the variables included in the model were able to influence the variation of the dependent by 51.11 %.

Table 3. Socio-economic determinants of net monthly income for women aquapreneurs (n=245)

Variables	Coefficients	t value	Sig.
Constant	13.452	4.543	0.000*
Total area holding	17.846	0.649	0.518
Age	5.865	1.115	0.269
Educational qualification	-48.803	0.167	0.868
Social participation	5.825	1.715	0.88
Extension contact	18.891	1.274	0.530
Experience	19.823	1.834	0.071**
Model summary			
R-squared	0.581		
Adj. R-squared	0.511		
F-Statistic	1.147		
Prob>F	0.344		

Note: * Significant at 1% level of significance and ** significant at 10% level of significance.

CONCLUSION

The comparative socio-economic assessment of the men and women aquapreneurs revealed that men aquapreneurs are in a socio-economically better position than women aquapreneurs who are residing in a relatively disadvantaged position with regards to many socio-economic parameters. The findings of the study revealed that men aquapreneurs had a very high total area holding as compared to women aquapreneurs who possessed a negligible amount of area holding. This needs to be improved through organizing women targeted capacity building programs exposing them to advanced technologies and income generating activities on a larger scale. The study also revealed that women aquapreneur faced problem in owning of land which may be solved by the government on an urgent basis to urge their interest to expand their enterprise on a large scale. The extension contact for women aquapreneur was found to be very low which maybe improved through regular farm visits by the department officials, conducting FGDs with nearby women groups involved in aquapreneurship activities, organizing training

programmes at the block level, etc. The study revealed that men aquapreneurs are in a better position as compared to women aquapreneurs and a focussed attention is sinequanon for promoting women aquaprenurs more prosperously. Women aquapreneur promoting schemes, financial assistance and providing handholding support in the form of developing Micro-incubation units are the needed interventions for further prosperity and sustainability. The assistance available for women entrepreneurs under PMMSY can also act as a boon for expanding their scale of business.

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

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