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# A Study on Socio-economic conditions of the Fishermen of Cage Culture in Telangana

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**Abstract:**

A study of the socioeconomic conditions is a prerequisite for the suitable design and successful implementation of any project, training, demonstration, or government developmental programs. The present study was conducted to assess the socioeconomic characteristics namely education, employment, income levels from aquaculture, and other farm and nonfarm activities of fish farmers of Telangana, along with the status of fish farming and livelihood of the fish farmer. The fish farmers are the key stakeholders of the fisheries **sector. Cage** farming is a technology where fishes being enclosed in a net cage which allows free flow water and can be reared fish from fingerling to marketable size. Telangana is the 29$^{th}$ state (formed in 2014) mainly consists of Dams, Reservoirs, Inland tanks, Ponds and Lakes so far, research studies has not been undertaken on Reservoir cage farming in Telangana. Cage culture is an aquaculture production system where fish are held in floating net pens. Cage culture of fish utilizes existing water resources but encloses the fish in a cage or basket which allows water to pass freely between the fish and the pond permitting water exchange and waste removal into the surrounding water. Results showed the complete view of the research for socio-personal and economical as per the age is considered as an important factor in any study, as it would explain profession based on experience. Data represented that 46.67 per cent of the respondents had fisheries as their main occupation. Mainly respondent (90.00%) were married and the rest of the farmers (10.00%) were unmarried. The important to know annual income indicated that half of the respondents (58.00%) had an annual income of less than ₹ 3.0 lakhs. 50 per cent of the farmers had 2 to 4 years of experience in farming and family status clearly stated that about 55.33 per cent of the cage farmers belonged to nuclear family followed by joint family. Majority of the respondents (66.67%) had medium level of information seeking behavior followed by high level with 23.33 per cent of the farmers. It is proven that most of them had medium level of information seeking behavior and the farmers were getting information mainly by discussing with fellow cage farmers and department officials. Social participation denotes the involvement of the respondents in organizations. It would lead to interactions with various kinds

of people and results in improvement in his/her knowledge and skill, The results revealed that more than half of the surveyed cage farmers (53.33%) had medium level of social participation. Based on the findings of the study, it is concluded that most of the respondents in the study area had medium level of exposure and medium level of scientific orientation

**Keywords**: Socio-personal and economics, Cage culture, Fishermen, Telangana

## Introduction

Fisheries is an important sector in India and plays a significant role in livelihood security, and socioeconomic improvement of the country, by enhancing family income, generating gainful employment, and providing healthy food to the millions of rural people.

Dissertation have been initiated to assess the status and impact of cage culture in inland reservoirs in Telangana state. In view of CIFRI experience, The Researcher has conducted research in Telangana state where there is a huge inland water bodies. State positioned third in resources in India. It consisted of 33 districts out of it, for research selected 6 districts where the cage culture practiced. Cage aquaculture, though relatively new to the inland aquaculture scenario of the country, brings in new opportunities for optimizing fish production from the reservoirs and lakes, and also developing new skills among fishers and entrepreneurs to enhance their earnings. National Level Committee to Develop Guidelines for Cage Culture in Inland Open Waters' (NCGCC) was constituted on 25 April 2016 with a mandate (a) to assess the potential of this culture system to contribute to increased production, employment, income generation and other benefits, (b) to assess the possible environmental and socio-economic impact, (c) to suggest precautions to be taken, and (d) to suggest the modes of propagating and scaling up of this technology to optimize benefits on a sustainable manner. Although my research projects have been initiated to assess status and impact of cage culture in inland reservoirs in Telangana state. The ICAR-Central Inland Fisheries Research Institute, the Institute where most of the research on cage culture has taken place. In view of their experience i conducted my research in Telangana state where there is a huge inland water bodies. State positioned third in resources in India. It consisted of 33 districts out of it, for research selected 6 districts where the cage culture practiced.

Telangana is the 29$^{th}$ state (formed in 2014) mainly consists of Dams, Reservoirs, Inland tanks, Ponds and Lakes. So far, research studies have not been undertaken on Reservoir cage farming in Telangana. Due to lack of data on reservoir cage farming technology adoption, I have chosen this line of research. This study will help to identify

and document the adoption practices in reservoir cage farming and suitable policy measures could be drawn which benefits the farmers as well as state government for implementing various development programmes

A study of the socioeconomic conditions is a prerequisite for the suitable design and successful implementation of any project, training, demonstration, or government developmental programs. The present study was conducted to assess the socioeconomic characteristics namely education, employment, income levels from aquaculture, and other farm and nonfarm activities of fish farmers of Telangana, along with the status of fish farming and livelihood of the fish farmer. The fish farmers are the key stakeholders of the fisheries sector

**Scope of the study**

The findings of the study would reflect the socio-economic condition of reservoircage farmers. It would bring to light aware the study on extent of technology for promoting and strategies in reservoir cage farming and culture aspects as well. The study will document the culture practices, production levels, funding sources, and income earnings. It investigates the constraints faced by the reservoir cage farmers and suggests policy recommendations for improving the socio-economic and livelihood status of reservoir cage farmers in selected district such as Khammam, Karimnagar, Mahaboobnagar, Nirmal, Nizambad, Sangareddy of Telangana state.

## Materials and Methods

Sources of data

During the collection of data, both primary and secondary sources has been Used Primary data were collected from fish farmers whereas secondary information was procured from fishery offices.

Socioeconomic research variables Different variables were identified in socio-domain viz., the profile of fish farmers - personal, socioeconomic, psychological, communication, and situational characteristics was included. A structured interview scheduled was developed integrating all the queries to achieve the objectives set for the study. The collected data was tabulated for statistical analysis.

**Selection of the respondents**

Total number of cages sanctioned 240 for which available and registered farmers 740 fishermen in that actively involved in the management of cages 15 fishermen, which are selected from six districts, 150 progressive respondents were selected randomly to collect the primary data as per the objectivesof the study and the reservoir-wise sample size details (Table 3) are given as below:

Statistical analysis

Percentage calculated by using mean statistical tool like MSExcel was used.

**Table 1. District-wise distribution of selected respondents for the study**

***(n=150)***

| SI. No. | Districts | Total number of cages Sanctioned | Number of respondents selected |
|---|---|---|---|
| 1 | Khammam | 80 | 34 |
| 2 | Karimnagar | 40 | 12 |
| 3 | Mahabubnagar | 20 | 12 |
| 4 | Sangareddy | 30 | 26 |
| 5 | Nizamabad | 30 | 54 |
| 6 | Nirmal | 40 | 12 |
| | Total | 240 | 150 |

**Table 2.**

**Reservoir-District wise distribution of selected respondents for the study**

***(n=150)***

| SI. No. | Name of the Reservoir | District | Total number of Fishermen under cage unit | Number of respondents selected |
|---|---|---|---|---|
| | Lower Manair Dam | Karimnagar | 100 | 12 |
| | Palair reservoir | Khammam | 80 | 12 |
| | Lankasagar reservoir | Khammam | 80 | 10 |
| | Wyra | Khammam | 100 | 12 |
| | Singoor reservoir | Sangareddy | 40 | 12 |
| | Bogulampally, Husnabad reservoir | Sangareddy | 40 | 14 |
| | Alisagar reservoir | Nizamabad | 40 | 15 |
| | Gangicheruvu (Renchal) | Nizamabad | 40 | 12 |
| | Ooracheruvu (Velmal) | Nizamabad | 40 | 12 |

| | | | | |
|---|---|---|---|---|
| | Ashoksagar | Nizamabad | 40 | 15 |
| | Koilsagar reservoir | Mahabubnagar | 100 | 12 |
| | Kadam Project | Nirmal | 40 | 12 |
| **Total** | | | **740** | **150** |

**Table 3. Selected variables and their empirical measurements**

| SI. No. | Variable | Reference for measurement |
|---|---|---|
| **A.** | **Independent variables** | |
| 1. | Age | Scoring procedure followed by Nithya (2015) |
| 2. | Educational status | Scoring procedure followed by Bhargavi (2019) |
| 3. | Occupational status | Scoring procedure followed by Harsha (2016) |
| 4. | Marital status | Scoring procedure followed by Chathurna (2017) |
| 5. | Annual income | Scoring procedure followed by Bhargavi (2019) |
| 6. | Annual Expenditure | Scoring procedure followed by Balaji (2013) |
| 7. | Annual Saving | Scoring procedure followed by Balaji (2013) |
| 8. | Experience in cage farming | Scoring procedure followed by Harsha (2016) |
| 9. | Family status | Scoring procedure followed by Vigneshwaran (2017) |
| 10. | Information seeking behavior | Scoring procedure followed by Vigneshwaran (2017) |
| 11. | Social participation | Scoring procedure followed by Singh (2009) |
| 12. | Mass media exposure | Scoring procedure followed by Balaji (2013) |
| 13. | Risk orientation | Scoring procedure followed by Bhargavi (2019) |
| 14. | Innovativeness | Scoring procedure followed by Balaji (2013) |

| | | |
|---|---|---|
| 15. | Contact with the Extension Agency | Scoring procedure followed by Nithya (2015) |
| 16. | Scientific orientation | Scoring procedure followed by Vigneshwaran (2017) |
| 17. | Decision making behavior | Scoring procedure followed by Bhargavi (2019) |
| 18. | Trainings participated | Scoring procedure followed by Vigneshwaran (2017) |
| 19. | Economics Motivation | Scoring procedure followed by Balaji (2013) |
| 20. | Perception about cage farming | Scoring procedure followed by Balaji (2013) |
| 21. | Knowledge level of the fisherfolk on cage farming | Scoring procedure followed by Balaji (2013) |
| **B.** | **Dependent variable** | |
| 1. | Impact on cage farming practices by fishermen | Scoring procedure developed for this study |

## Results and Discussion

### Socio-Personal and Economic Profile of Reservoir Cage Fishermen

The socio-personal and economic characteristics of reservoir cage farmers will give a profound influence to determine the livelihood status and background development progress among the respondents. About 15 variables have been selected based on judges' opinion and the results are discussed below.

**1. Age**

Age is considered as an important factor in any study, as it would explain one's profession based on experience. It is stated that the age of the respondent may havedefinitive influence on dependent variables. According to their age, the distribution of the respondents are presented in Table 4.

**Table 4. Distribution of the respondents according to their age**

***(n=150)***

| SI.No. | Category | Number | Percentage |
|---|---|---|---|
| 1. | Young (up to 35 years) | 40 | 26.67 |
| 2. | Middle (36 - 45 years) | 46 | 34.67 |
| 3. | Old (above 45 years) | 58 | 38.67 |
| **Total** | | **150** | **100.00** |

**SOURCE:Primary data**

The data presented in the Table 4. indicated that about 38.67 per cent of the respondents were of old age category, followed by the middle (34.67%) and the young (.67%) age categories. The findings of this study is in accordance with Mohan Maloth et al. (2020) who concluded that majority of the fish farmers belonged to old age category.

**2. Educational status**

Educational status of the respondents is considered to be a critical factor based on profound influence on the dependent variable. Data gathered have been distributedand listed in the Table 5. and Fig 1.

**Table 5. Distribution of the respondents based on educational status**

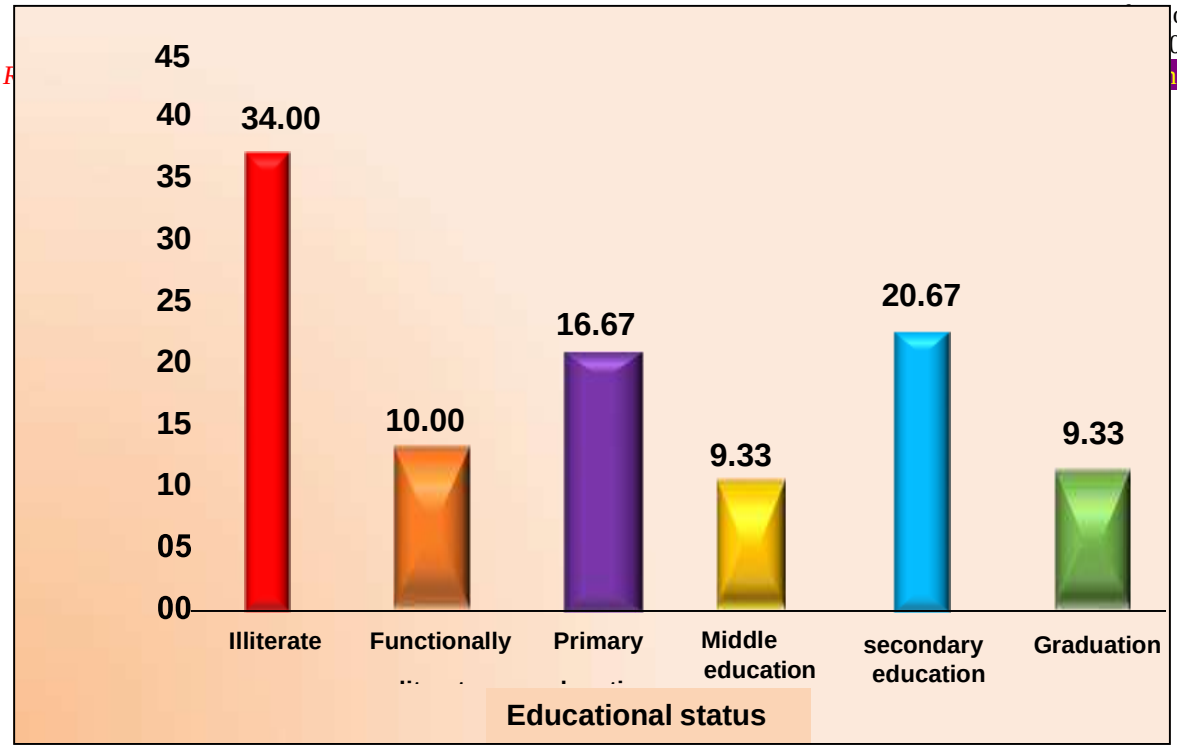
***(n=150)***

| SI.No. | Category | Number | Percentage |
|---|---|---|---|
| 1. | Illiterate | 51 | 34.00 |
| 2. | Functionally literate | 15 | 10.00 |
| 3. | Primary education | 25 | 16.67 |
| 4. | Middle education | 14 | 9.33 |
| 5. | Secondary education | 31 | 20.67 |
| 6. | Graduation | 14 | 9.33 |
| **Total** | | **150** | **100.00** |

**SOURCE:Primary data**

Data presented in the Table 5, clearly stated that about 34.00 per cent of the cage farmers were illiterates, followed by, secondary, primary education, functionally literate, middle and graduation as reported by 20.67 per cent, 16.67 per cent, 10.00 per cent, and 9.33 per cent of the cage farmers. The findingsof the study coincide with Aura et al. (2017), who reported that majority of the respondents had illiterate education level. ***(n=150)***

**Percentage**




Occupational status of the respondents is distributed based on the findings ofthis study and presented in Table 6.

**Table 6. Distribution of the respondents based on occupational status**

***(n=150)***

| SI.No. | Category | Number | Percentage |
|---|---|---|---|
| 1. | Fisheries only | 70 | 46.67 |
| 2. | Fisheries and allied activities | 35 | 23.33 |
| 3. | Others (business, marketing or government employee) | 45 | 30.00 |
| 4. | None | -- | -- |
| **Total** | | **150** | **100.00** |
| **SOURCE:Primary data** | | | |

From the Table 6, the results represented that 46.67 per cent of the respondents had fisheries as their main occupation, 30.00 per cent and 23.33 per centof the farmers had other occupations (business, marketing or government employee)and fisheries and allied activities as their main occupation, respectively. Syandri et al. (2015) observed that majority of the respondents were involved in cage farming occupation.

### 4. Marital status

**Table7.The distribution of the marital status of the respondents are presented**

***(n=150)***

| SI.No. | Category | Number | Percentage |
|---|---|---|---|
| 1. | Unmarried | 15 | 10.00 |
| 2. | Divorce | 0 | 0 |
| 3. | Widow | 0 | 0 |
| 4. | Married | 135 | 90.00 |
| **Total** | | **150** | **100.00** |
| **SOURCE:Primary data** | | | |

The results indicated that majority of the respondents (90.00%) were married and the rest of the farmers (10.00%) were unmarried. The findings of this study coincides with the findings of Ali Hassan and Veerabhadran (2006) who concluded that majority of the respondents were married.

**5. Annual income**

Annual income denotes the status of an individual or respondent in the social system and it refers to the income earned by the respondent through fisheries and aquaculture practices, and also the wages from agriculture or allied business activities.The collected data was assessed and presented in Table8.

**Table 8. Distribution of the respondents based on annual income**

***(n=150)***

| SI.No. | Category | Number | Percentage |
|---|---|---|---|
| 1. | Below ₹ 3 lakhs | 87 | 58.00 |
| 2. | ₹ 3 to 5 lakhs | 63 | 42.00 |
| 3. | ₹ 5 to 8 lakhs | 0 | 0 |
| 4. | ₹ 8 to 10 lakhs | 0 | 0 |
| 5. | ₹ Above 10lakhs | 0 | 0 |
| **Total** | | **150** | **100.00** |
| **SOURCE:Primary data** | | | |

The results presented in the Table 8. indicated that half of the surveyed respondents (58.00%) had realized an annual income of less than ₹ 3.0 lakhs, 42.00per cent of the farmers generated an income of ₹ 3.0 lakhs to ₹ 5.0 lakhs per annum and the results matched with the findings of Roy (2012), where majority of the respondents had ₹ 30,000 to ₹ 40,000 as the annual income.

### 6. Experience in farming

Through experience in fish farming sector, the farmers might have better knowledge and capability in handling the cage which in turn determines the success in farming as well as improvement in livelihood status. The findings of the study are presented in the Table 9.

**Table 9. Distribution of the respondents according to experience in farming**

***(n=150)***

| SI.No. | Category | Number | Percentage |
|---|---|---|---|
| 1. | Up to 2 years | 50 | 33.33 |
| 2. | 2 to 4 years | 75 | 50.00 |
| 3. | Above 4 years | 25 | 16.67 |
| **Total** | | **150** | **100.00** |

**SOURCE:Primary data**

The results (Table 9.) showed that more than 50 per cent of the farmers (50.00%) had 2 to 4 years of experience in farming, 33.33 per cent of the reported farmers had 2 years of experience and 16.67 per cent of the respondents experiencedabove 4 years of farming. A similar study was carried out by Pandey et al. (2013) whoconcluded that majority of the respondents had medium level of experience in farming.

***(n=150)***

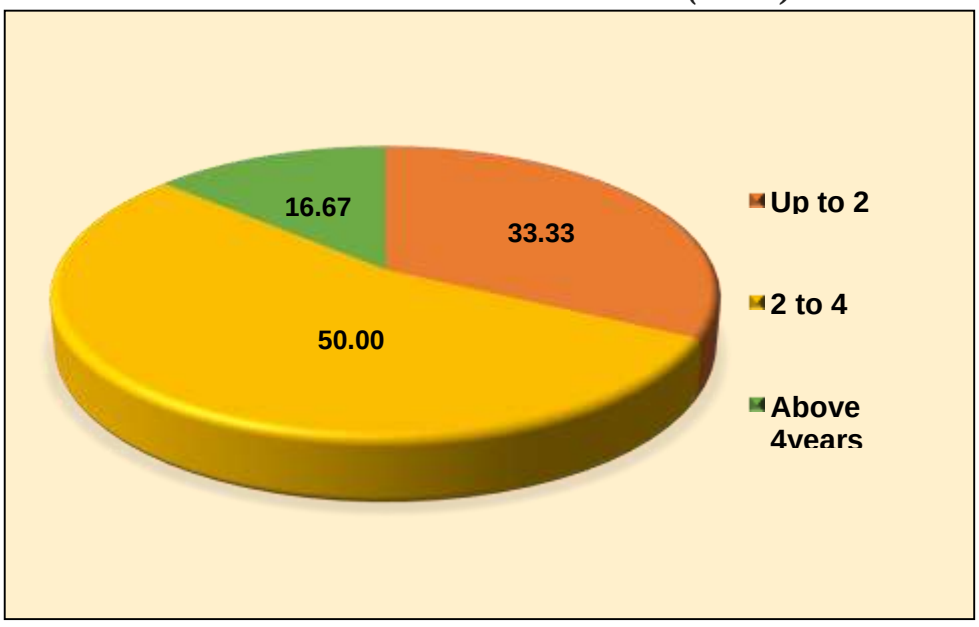



**Fig 2. Experience in farming**

### 7. Family status

The term family status denotes the nature and existence of the respondent in asocial structure i.e. nuclear or joint family. The findings of this study are presented in Table 10.

**Table 10. Distribution of respondents based on family status**

***(n=150)***

| SI. No. | Category | Number | Percentage |
|---|---|---|---|
| 1. | Nuclear family | 83 | 55.33 |
| 2. | Joint family | 67 | 44.67 |
| **Total** | | **150** | **100.00** |

**SOURCE:Primary data**

which clearly stated that about 55.33 per cent of the cage farmers belonged to nuclear family followed by joint family for 44.67 per cent of the respondentsin the study area. The findings are in accordance with Ashwinikumar (2014), who stated that majority of the respondents (70%) belonged to nuclear family.

## 8. Information Seeking Behavior

To find out the information seeking behavior of the respondents on reservoir cage farming, details were collected and analyzed. The results of this study are presented in Table11.

**Table 11. Distribution of the respondents based on information seekingbehavior**

***(n=150)***

| SI. No. | Level | Number | Percentage |
|---|---|---|---|
| 1. | Low (up to 4.96) | 15 | 10.00 |
| 2. | Medium (4.97 - 7.03) | 100 | 66.67 |
| 3. | High (above 7.03) | 35 | 23.33 |
| **Total** | | **150** | **100.00** |
| **SOURCE:Primary data** | | | |

Based on the data presented in Table 11, majority of the respondents (66.67%) had medium level of information seeking behavior followed by high level with 23.33 per cent of the farmers. It is proven that most of them had medium level of informationseeking behavior and the farmers were getting information mainly by discussing with fellow cage farmers and department officials. This is in line with the findings of Balaji (2013), who revealed that 98.33 per cent of the fish farmers sourced their information through Television, NGOs and newspapers, respectively.

*(n=120)*

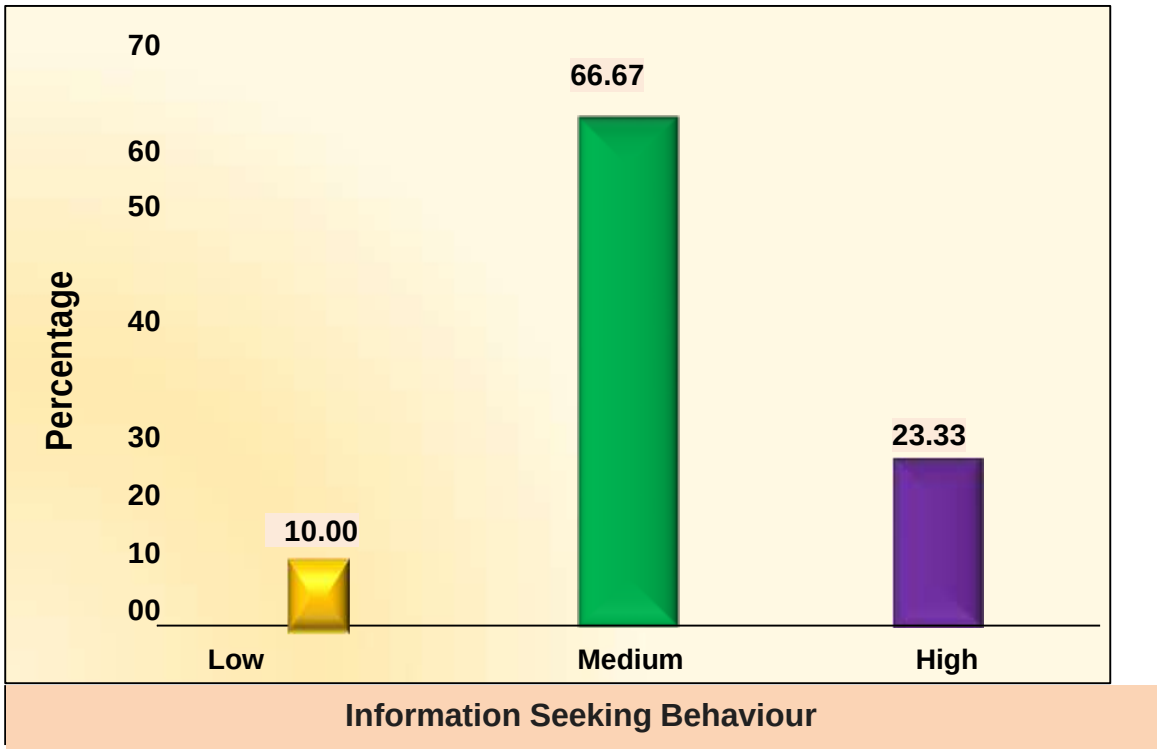



**Fig 3. Information Seeking Behavior of the Reservoir Cage Farmers**

## 9. Social Participation Status

Social participation denotes the involvement of the respondents in organizations. It would lead to interactions with various kinds of people and results in improvement in his/her knowledge and skill. To find out the trend in this factor, social participation status was studied and the details are furnished in Table 12.

**Table 12. Distribution of the respondents according to the social participation**

*(n=150)*

| SI. No. | Level | Number | Percentage |
|---|---|---|---|
| 1. | Low (up to 21.90) | 45 | 30.00 |
| 2. | Medium (21.91 - 28.00) | 80 | 53.33 |
| 3. | High (above 28.00) | 25 | 16.67 |

| | | |
|---|---|---|
| **Total** | **150** | **100.00** |

**SOURCE:Primary data**

The results revealed that more than half of the surveyed cage farmers (53.33%) had medium level of social participation, 30.00 per cent and 16.67 per cent of the farmers had low and high level of social participation, respectively. From the above findings, it is clearly stated that most of the respondents in the study area had mediumlevel of social participation and the results are in accordance with the findings of Mohan Maloth et al. (2020), who concluded that majority of the respondents had medium level of social participation.

**10. Mass Media Exposure**

It is a known fact that, if a farmer is exposed to mass media like television, radio, newspaper, magazine and mobile phones, he/she could be able to collect more information and technical knowledge related to cage farming practices. Through this, they can share and communicate the latest information from one hand to another. The information pertaining to the respondents' exposure to mass media ispresented in the Table13.

**Table 13. Distribution of the respondents based on mass media exposure**

***(n=150)***

| **SI. No.** | **Level** | **Number** | **Percentage** |
|---|---|---|---|
| 1. | Low (up to 10.74) | 25 | 16.67 |
| 2. | Medium (10.75 - 17.25) | 92 | 61.33 |
| 3. | High (above 17.25) | 33 | 22.00 |
| **Total** | | **150** | **100.00** |
| **SOURCE:Primary data** | | | |

It is keen to note that about 61.33.84 per cent, 22.00 per cent and 16.67 per cent of the respondents had medium, low and high level of mass media exposure, respectively. Based on the findings of the study, it is concluded that most of the respondents in the study area had medium level of exposure. The findings of the studysupport the line of Alagappan and Kumaran (2020), who stated that farm publicationsand online resource were referred by 11.25 and 8.75 per cent of the fish farmers. Farmliterature in the form of manuals, booklets, journals were preferred.

**11. Scientific Orientation**

The term scientific orientation refers to the degree by which the respondent oriented towards the use of advanced scientific methods and practices in cage farming and the results are presented in Table 14.

**Table 14. Distribution of the respondents based on scientific orientation**

***(n=150)***

| **Sl. No.** | **Level** | **Number** | **Percentage** |
|---|---|---|---|
| 1. | Low (below 20.55) | 47 | 31.33 |
| 2. | Medium (20.56 – 29.44) | 83 | 55.33 |
| 3. | High (above 29.44) | 20 | 13.33 |
| **Total** | | **150** | **100.00** |
| **SOURCE:Primary data** | | | |

Data furnished in the Table 14. clearly showed that more than fifty per cent ofthe cage farmers (55.33%) in the study area had medium level of scientific orientation,followed by low and high level of orientation for 31.33 per cent and 13.33 per cent of the reported respondents, respectively. The findings of this study are on with the study undertaken by Immanuel (2004) and Cyril et al. (2013) who revealedthat most of the respondents had medium level of scientific orientation.

**Table 15. Distribution of the most significance variables with Mean**

| **Sl.No.** | **Variable** | **Most Significance** | **Percentage** | **Mean** |
|---|---|---|---|---|
| 1. | Age | Old>45 | 38.67 | 33.33 |
| 2. | Educational Status | Illiterate | 34.00 | 16.67 |

| | | | | |
|---|---|---|---|---|
| 3. | Occupational Status | Fisheries only | 46.67 | 33.33 |
| 4. | Marital Status | Married | 90.00 | 37.5 |
| 5. | Annual Income | Below ₹ 3 lakhs | 58.00 | 20.00 |
| 6. | Experience In Fish Farming | 2 to 4 years | 50.00 | 38.83 |
| 7. | Family Status | Nuclear family | 55.33 | 50.00 |
| 8. | Information Seeking Behavior | Medium (4.97 - 7.03) | 66.67 | 33.33 |
| 9. | Social Participation Status | Medium (21.91 - 28.00) | 53.33 | 33.33 |
| 10. | Mass Media Exposure | Medium (10.75 - 17.25) | 61.33 | 33.33 |
| 11. | Scientific Orientation | Medium (20.56 – 29.44) | 55.33 | 33.33 |
| 12. | | | | |

**SOURCE:Primary data**

**SUGGESTION**

Socioeconomic aspects of the fish farming community should receive due attention in planning the schemes and Government subsidies for promoting aquaculture. While formulating, designing, and implementing developmental programs the socio-economic structures of fish farmers must be taken into attention. The above-mentioned Socio-economic parameters like family size, age, social participation, income level, education, and nature of ownership of pond influence fish production. Studies on these parameters not only to elucidate the socio-economic conditions of the fish farmers but also to spot the factors inhibiting the realization of the complete potential of traditional fishery and also the appropriate area for presidency intervention.

**Conclusion :**

Enlightening the socio-economic and livelihood status of reservoir cage farmers in selected district such as Khammam, Karimnagar, Mahaboobnagar, Nirmal, Nizambad, Sangareddy of Telangana state. Total number of cages sanctioned 240 for fishermen in that actually involved in the management of cages 10 fishermen which are selected from six

districts and 12 reserviours for the study, 150 progressive respondents were selected randomly to collect the primary data as per the objectivesof the study and the reservoir-wise sample size. Results and discussion showed the complete view of the reaserch for socio-personal and economical as per the age is considered as an important factor in any study, as it would explain profession based on experience. The findingsof the study coincide with Aura et al. (2017), who reported that majority of the respondents had illiterate education level. Data represented that 46.67 per cent of the respondents had fisheries as their main occupation. Mainly respondent (90.00%) were married and the rest of the farmers (10.00%) were unmarried. The social system and it refers to the income earned by the respondent through fisheries and aquaculture practices, and also the wages from agriculture or allied business activities important know annual income indicated that half of the respondents (58.00%) had an annual income of less than ₹ 3.0 lakhs. Experience in fish farming sector, the farmers might have better knowledge and capability in handling the cage which in turn determines the success in cage farming as well as improvement in livelihood data showed that the 50 per cent of the farmers had 2 to 4 years of experience in farming and family status clearly stated that about 55.33 per cent of the cage farmers belonged to nuclear family followed by joint family. Majority of the respondents (66.67%)had medium level of information seeking behavior followed by high level with 23.33 per cent of the farmers. It is proven that most of them had medium level of informationseeking behavior and the farmers were getting information mainly by discussing with fellow cage farmers and department officials. Social participation denotes the involvement of the respondents in organizations. It would lead to interactions with various kinds of people and results in improvement in his/her knowledge and skill, The results revealed that more than half of the surveyed cage farmers (53.33%) had medium level of social participation. Based on the findings of the study, it is concluded that most of the respondents in the study area had medium level of exposure and medium level of scientific orientation.

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