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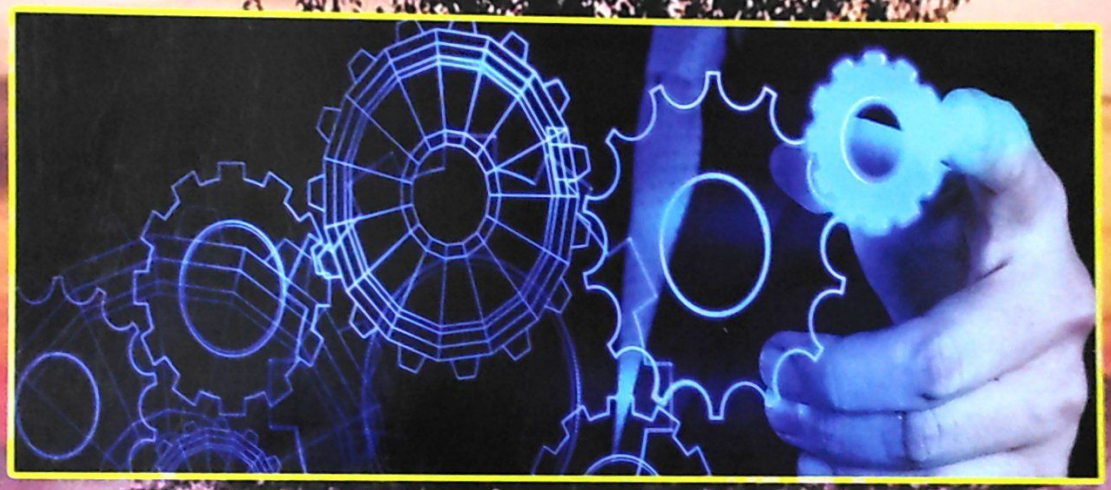

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Social License for Aquaculture: A Case Study of Tundurru Village of West Godavari District, Andhra Pradesh (India)

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Abstract

The present paper is an attempt to study the opinions of the villagers on the expansion of aquaculture in the village of Tundurru and understand the larger view of the village on the establishment of food parks in the area. A sample of 172 villagers were administered a structured questionnaire, and the data was collected, quantified, analyzed, and interpreted. The study reveals that the villagers are against the negative impact of aquaculture on environment though they are all aware of the economic benefits of the sector. Hence, it is suggested that social license must be the first requirement to be fulfilled before establishing new development projects. The Governments/Managements need to precheck all likely challenges before embarking on a project.

***Key words**: aquaculture, establishment, environment, social license, negative impact.*

Introduction

Aquaculture is one of the fast-growing sectors in India. Both the Central and the State Governments focus on the horizontal expansion of aquaculture. A large number of entrepreneurs, business people and corporate companies, besides regular farmers, have entered the field for its promising returns in a short span. Global fish production peaked at about 171 million tonnes in 2016. India had a contribution of 7.1% with 5700 thousand tonnes of production by 2016 (FAO, 2018). The value of Indian aqua exports grew from 1763 million USD in 2006 to 5546 million USD in 2016. In 2016-17, the overall shrimp production reached 600,000 tons. India targets one million MT of shrimp production by 2020 (Harkell, 2018). The aqua sector undoubtedly contributed to the growth of both income and employment opportunities in the country. However, its adverse impact on environment is decried by all sections of the people.

Context of the Study

The robust growth of the sector does not signify the grant of 'social license' which is defined as "the ongoing approval within the local community and other stakeholders, ongoing approval or broad social acceptance and, most frequently, as ongoing acceptance" (Sociallicense.com). Lack of social license can escalate into a greater issue of human rights, environmental irresponsibility or anti-poor or a suite of interlinked issues that could be more intractable and expensive to respond or a class action, for example, what started as public criticism from an environmentalist in India on a single issue – water abstraction – ended in the Honorable Supreme Court ordering the closure of brackish water shrimp aquaculture (Bueno, 2008). In many areas where aquaculture is intensively taken up, there is an undercurrent of unrest brewing against aqua farming for various reasons, of which the negative impact on environment is a major one. In some places like Tundurru village of West Godavari District in Andhra Pradesh, open agitations against the establishment of food parks are taken up. In the midst of a rift between the State Government which has granted permission to establish the Park and the people of the village who are worried about its adverse impact on environment, the issue hit the headlines of state and national dailies for a period of time.

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The researcher who hails from the same district was drawn to the issue, and an attempt was made to find out why the people of Tundurru are against development projects in the village and what their views on the expansion of aquaculture are.

Methodology

Sample: For the purpose of the study, a random sample of 172 people from Tundurru, Bhimavaram Mandal, West Godavari District were consulted.

Profile of the Respondents: The sample villagers include farmers (33.7%), students (16.8%), employees (23.2%), un-employees (5.2%) and businessmen (20.9%). Among the sample respondents, above 68% of are land owners while 31.3% are the landless. Again, among the land owners, 50.8% are aqua farmers, whereas 49.1% are paddy farmers. The sample covers both genders with 66.2% men and 33.8% women. They belong to different age-groups: 20-40 (56.9%), 40-60 (24.4%), and above 60 (18.6%). All are literates but their level of education varies: Primary (20.9%), Secondary (38.3%), Intermediate (5.8%), Under-graduation and above (34.8%).

Objectives of the Study:

- To study the views of the villagers on the impact of aquaculture on environment.
- To assess the opinions of the villagers on the economic benefits of aquaculture.
- To find out the reasons for the growing unrest against food parks and such developments.

Hypothesis Statements:

- The villagers agree that aquaculture is not good for environment.
- The villagers agree that there are economic benefits from aquaculture.

Research Tools: Research tools are standardized instruments that are necessary to collect data for interpretation and analysis. The present study used both conventional and statistical research tools in the process of gathering data, analyzing the results, and finally achieving the stated objectives.

The main purpose of questionnaires is to explore a specific issue by collecting opinions and attitudes of the respondents. In the current study, a questionnaire is prepared on *Likert Five-Point Scale*, which is a psychometric scale originally developed by Rensis Likert, an American social psychologist. The Scale is helpful in receiving the participants' preferences or degree of agreement or disagreement with a statement. It is a bipolar scale that measures either a positive or negative response to a statement. In a traditional Likert Scale, a declarative statement is purposefully designed to express a clearly positive or negative opinion rather than a neutral one. It contains five options – *agree, strongly agree, neither agree nor disagree, disagree,* and *strongly disagree*. Respondents are allowed to indicate their preferences by ticking or circling the chosen option.

The Questionnaire consists of three sections. Section-I gathers personal information of the sample respondents. Section-II with ten statements collects their opinions on the environmental impact of aquaculture like water pollution, water scarcity, water salinity, air pollution, loss of soil fertility, health problems, greenery disappearance, impact on wild fisheries, fecal and unused wastes, and disease transfer. Section-III with ten statements is aimed at understanding their views on the economic benefits of aquaculture such as high profits, employment creation, village development, food security, increase of asset value, infra development, industrial development, women employment, local employment, and best alternative activity.

In differential analysis, a *Z-Test* is used to test the hypothesis formulated, where the sample size is above 30. As the sample size in the present study is 172, *Z-Test* is taken for statistical analysis.

Analysis of section-II

The responses of the villagers on the statements 1-10 given in Section-II of the questionnaire are presented in Table 1 for statistical analysis and interpretation of data.

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Table 1

Farmers' Responses on Statements from 1 to 10

Sl. No.	*Likert Five-Point Scale*					Adjusted into two columns	
	SA	A	NAND	D	SD	A	D
1	103	31	0	09	29	134	38
2	137	15	2	8	11	152	20
3	122	27	0	13	10	149	23
4	129	21	10	4	8	155	17
5	63	78	4	20	7	143	29
6	94	49	0	17	12	143	29
7	94	60	4	3	11	156	16
8	71	74	6	20	1	148	24
9	130	17	8	17	0	151	21
10	138	1	6	06	21	142	30
Means	108.1	37.3	4	11.7	11	147.3=**147**	24.7=**25**

(Source: Primary data)

Note. SA = *Strongly agree*; A = *Agree*; NAND = *Neither agree nor disagree*; D = *Disagree*; SD = *Strongly disagree*.

For conducting the statistical analysis, the data in the first four columns of Table 1 are rearranged into two columns (last two). The responses received in the columns *strongly agree* and *agree* are added, and the total is considered as agreed. Likewise, the responses received in the columns *disagree* and *strongly disagree* are added, and the total is considered as disagree. The responses received in the column *neither agree nor disagree* are shared to both sides equally.

The *Z* calculated value is compared with the critical value of *Z* for verifying the Null Hypothesis. In the present context, the sample size is N = 172, the number of favorable cases is X=147, the sample proportion of the favorable cases is p = X/N = 147/172 = 0.8547, and the significance level is (1- α) % i.e. 95% α =0.05. The assumed P and Q values are 0.85 and 0.15. Therefore, the Null Hypothesis is P=0.85 (x is not significantly different from μ) while Alternative Hypothesis is P ≠ 0.85. The Z-statistic is calculated with the formula below.

$$Z = \frac{p - P}{\sqrt{PQ/n}} = \frac{0.8547 - 0.85}{\sqrt{0.85(1-0.85)/172}} = 0.171$$

Interpretation: When the calculated value of *Z* 0.171 is compared with the Z-critical value 1.96, it is proved that the calculated value of *Z* is less than its critical value ($Z = 0.171 < 1.96$) and so it is not significant. Therefore, the Null Hypothesis is accepted. From this statistical analysis of the Section-II, it may be concluded that 147 out of 172 respondents accepted the opinion of the researcher saying that aquaculture is not good for its adverse ecological impacts including people's health problems.

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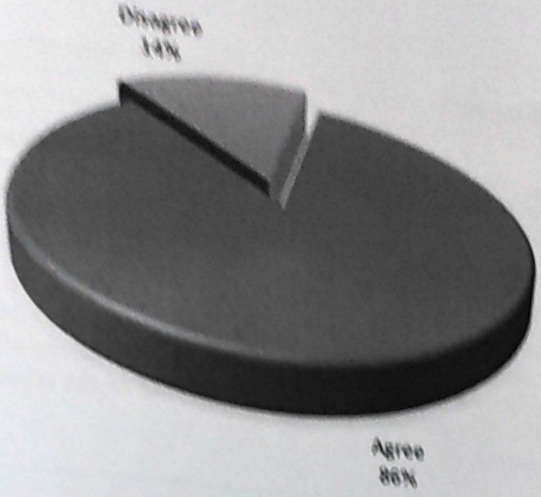

Figure 1. Comparison of Agree and Disagree Responses

Analysis of section-III

The responses of the farmers on the statements 11-20 given in Section-III of the questionnaire are presented in Table 2 for statistical analysis and interpretation of the data.

Table 2
Farmers' Responses on Statements from 11 to 20

Sl. No.	*Likert Five-Point Scale*					Adjusted into two columns	
	SA	A	NAND	D	SD	A	D
1	140	12	8	5	7	156	16
2	119	23	0	5	25	142	30
3	87	33	6	5	41	123	49
4	56	52	8	27	29	112	60
5	148	11	0	3	10	159	13
6	99	44	10	9	10	148	24
7	159	4	0	0	9	163	9
8	119	33	4	5	7	154	14
9	147	21	2	0	2	169	3
10	151	13	3	0	5	165	7
Means	122.5	24.6	4.1	5.9	14.5	149.1= **149**	22.9 **=23**

(Source: Primary data)

The Z calculated value is compared with the critical value of Z for verifying the Null Hypothesis. In the present context, the sample size is N = 172, the number of favorable cases is X=149, the sample proportion of the favorable cases is p = X/N = 149/172 = 0.8663, and the significance level is (1- α) % i.e. 95% α =0.05. The assumed P and Q values are 0.85 and 0.15.

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Therefore, the Null Hypothesis is P=0.85 (x is not significantly different from μ) while Alternative Hypothesis is $P \neq 0.85$. The Z-statistic is calculated with the formula below.

$$Z = \frac{p - P}{\sqrt{PQ/n}} = \frac{0.8663 - 0.85}{\sqrt{0.85(1-0.85)/172}} = 0.598$$

Interpretation: When the calculated value of Z 0.598 is compared with the Z-critical value 1.96, it is proved that the calculated value of Z is less than its critical value ($Z = 0.598 < 1.96$) and so it is not significant. Therefore, the Null Hypothesis is accepted. From this statistical analysis of the Section-III, it may be concluded that 149 out of 172 respondents accepted the opinion of the researcher saying that there are economic benefits from aquaculture.

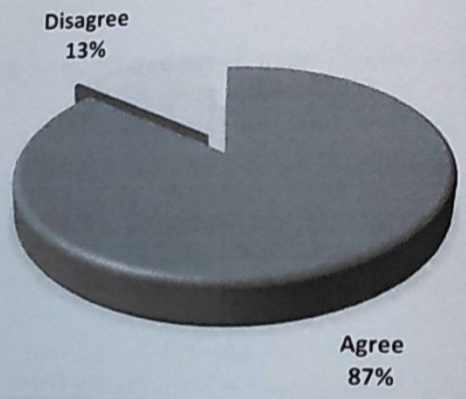

Figure 2. Comparison of Agree and Disagree Responses

Findings & Suggestions

The findings from the current study in regard to the first objective reveal that the villagers are completely against the adverse impact of aquaculture on environment. They are well aware of its negative affect and worried about the consequences of its expansion in the village. Pertaining to the second objective, the respondents agreed that there are many economic benefits from aquaculture for them as individuals and also for the village as a whole. Above 50 % of them are directly involved in aqua farming and consequently benefitted. The rest, though not involved in aquaculture, are indirectly impacted as income generation, employment creation, asset value appreciation etc., are conspicuous in all walks of life in the area.

From the analysis of the findings, it can be deduced that in spite of the economic benefits from aquaculture, the villagers are not happy with the expansion of aquaculture. Their unhappiness was consolidated against the establishment of food parks and other allied activities in the village, which, they feel, are a major threat for the environment in the village and its surroundings. Therefore, unrest against such establishments is observed.

Under these circumstances, it is suggested that social license i.e., people's acceptance is the first step for establishment or expansion of any economic activity. Hence, the governments/managements must ensure that the primary stake holders are properly convinced before embarking on any new development project in fields like agriculture and aquaculture which have larger and longer impact on environment. They should precheck: "What is the likelihood that a challenge is provoked from adversely affected parties, taking up their cause? What kind of challenge could be expected, from whom? and what are the likely consequences of a challenge to the aquaculture sector?" as all environmental impacts invariably translate to social impacts (Bueno, 2008).

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