

An analysis of net income of different craft and gear combinations in the Puttalam lagoon in Sri Lanka.

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Abstract

This paper reviews and compares the net income per trip by craft and gear combinations in the Puttalam lagoon in Sri Lanka. A semi-structured questionnaire survey was conducted among the sample drawn from fiber reinforced plastic boats (OFRP), motorized traditional boats (MTRB) and non-motorized traditional boats (NTRB) operated for crab and shrimp fishery in the Puttalam lagoon from January to December in 2015. A total number of craft sampled were 165 of which 65, 52 and 48 numbers of craft representing OFRP, MTRB, and NTRB. The data analysis performed using SPSS and EXCEL packages. To compare net income and to examine significance of income between and among different craft/gear combinations descriptive statistics were used. While Analysis of Variance (ANOVA) was used to find the significant differences of the income of the craft type. The results indicated that craft/shrimp net combination for OFRP, MTRB and NTRB earned higher net income compared to craft/crab net combination for same craft. As a result of low harvest of the higher price species of the crabs. However, ANOVA test proved that the inter craft category net income differences were not significant. Therefore, findings of this research suggest promoting non-motorized craft/gear combinations for fishing in the Puttalam lagoon.

Keywords: Puttalam lagoon, craft/gear combination, net income

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Introduction

Lagoons provide and an array of ecosystem services of which some of them are vital for the livelihood of surrounding communities. Among them fishing is the foremost and significant economic activity across all lagoons and estuaries in Sri Lanka. Puttalam Lagoon is one of the largest brackish water bodies of Sri Lanka, extending over 32,750 ha, which supports 5926 fishers for their livelihood (IUCN, 2012). Generally, it was pointed out by many scholars that there are many knowledge gaps with respect to socio-economic aspects of lagoons (Silva *et al.* 2013), which is no exception for the Puttalam lagoon. Fishing in the lagoon is carried out by using fiber reinforced plastic boats (OFRP), motorized traditional boats (MTRB) and non-motorized traditional boats (NTRB). A large variety of fishing gear types are in use for fishing in the Puttalam lagoon and among them crab net and shrimp net are common for all types of craft. This paper reviews and compares net income of different craft and gear combinations for crab and shrimp fishery in the Puttalam lagoon.

Material and Methods

There were about 2145 fishing crafts operated in the Puttalam lagoon consists of 778 OFRP, 162 MTRB and 1204 NTRB craft (IUCN, 2012). Hundred and sixty five fishing families were randomly selected; 65, 52 and 48 numbers of craft representing OFRP, MTRB, and NTRB respectively. Data were collected representing all fisheries Inspector Divisions around the lagoon, administering a semi-structured questionnaire, from January to December 2015. ANOVA and Cross tabulation techniques were used to find mean variance of the income by craft and gear combinations.

Results

More than 90 % of the lagoon fishers engage only fishing activities for their occupation and more than 50 % of the fishing families comprise 4-5 family members. Considered to the education level of the fishers, 40 % and 53 % of the fishers attended school below grade 5 and 6- O/L gradually. Since 65 % of the lagoon fishers have more than 15 years of experience, fishing in the lagoon is highly competitive. Hence, fishers try to practice different fishing techniques using size of fishing gear, which is changed by themselves. The main fishing gear used by craft were crab nets and shrimp nets. These two fishing gear were alternatively operated by fishing craft depending on season and projected catch rates. The unit of analysis was based on same craft with different fishing gear combinations. Table 1 indicates the operational aspects of selected craft/gear combinations.

Table 1. Net income, average fuel consumption and average catch per trip by different craft/gear combinations

| Craft/gear combination | | Mean net Income of the fishing unit per trip (after reduce the fuel cost) | Average Fuel consumed (l) | Average catch per trip (kg) |
|------------------------|------------|---|---------------------------|-----------------------------|
| NTRB | Crab net | 1027 | 0 | 3.6 |
| | Shrimp net | 1157 | 0 | 2.2 |
| MTRB | Crab net | 954 | 12.2 | 5.6 |
| | Shrimp net | 1493 | 12.7 | 5.2 |
| OFPR | Crab net | 2542 | 14.8 | 7.7 |
| | Shrimp net | 2710 | 13.3 | 6.8 |

The results show higher net income for shrimp net/ craft combination than crab net/craft combination for the respective types of craft. However, there were no significant difference in catch rates for crab net and shrimp net. Quantity harvest of the high valued crabs (mud crab) is low compared to the shrimp catch. However average day catch of the low valued crab is higher. The difference in craft wise net income is not explained by fuel cost as it was more or less similar for MTRB and OFRP craft. The variation in catch rates resulted in differences in net income for MTRB and OFRP craft. The highest net income per craft /gear combination observed for OFRP craft and followed by MTRB and NTRB craft. In terms of variable input

costs NTRB shows highest cost effective income due to zero fuel cost. Therefore, an ANOVA test was run to find out to reveal significant differences in income for craft/gear combinations. Table 2 shows results of tests of between subjects- effects. The above result shows that there is no significant effect ($P > 0.05$) of craft, gears, and craft/gear combinations for the income of the fishing unit.

Conclusion

Fishing unit with motorized craft in the Puttalam lagoon for crab net and shrimp net fishery were earned higher net income compared to non-motorized traditional craft. However, it was proved by ANOVA test that there are no significant differences of net income of NTRB, MTRB and OFRB craft for respective gear combinations. The exogenous costs (fuel) for motorized craft make negative externalities for both economy and environment. Hence, in respect to Puttalam lagoon it is recommended to promote non-motorized craft for fishing than motorized craft.

Table 2. Tests of Between-Subjects Effects (Dependent Variable: Net Income_

| Source | Type III Sum of Squares | df | Mean Square | F | Significance. |
|-----------------|---------------------------|----|--------------|--------|---------------|
| Corrected Model | 39510200.420 ^a | 5 | 7902040.08 | 1.217 | 0.309 |
| Intercept | 213704179.368 | 1 | 213704179.36 | 32.916 | 0.000 |
| Fishbo | 34342768.561 | 2 | 17171384.28 | 2.645 | 0.077 |
| fishgr | 1535262.652 | 1 | 1535262.65 | 0.236 | 0.628 |
| Fishbo * fishgr | 736255.068 | 2 | 368127.53 | 0.057 | 0.945 |
| Error | 506413781.723 | 78 | 6492484.38 | | |
| Total | 755147850.000 | 84 | | | |
| Corrected Total | 545923982.143 | 83 | | | |

a. R Squared = .072 (Adjusted R Squared = .013)

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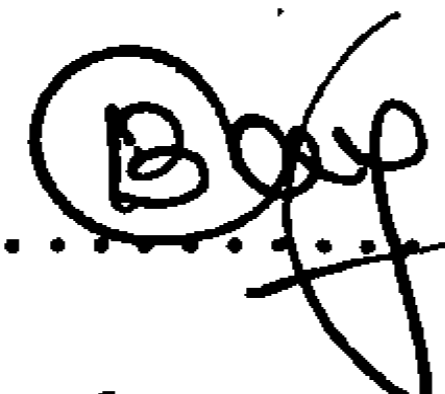
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