



# Assessing the Determinants of Collective Action in Common Property Brackish Water Management for Shrimp Farming in Bangladesh

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**1. Background:** shrimp is the second largest export sector of Bangladesh, which generated US \$418 million in 2007-08 (BFFEA, 2001). By nature, it is dependent on tidal flow of brackish water. The water passes from water source to the main canals, then sub-canals and the supply of water at the farms behind the sub-canals is usually done by using the others land (Fig 1). Thus, problem of head-enders and tail-enders arise. Head enders are getting direct access to water exchange and tail enders are facing restricted access. Due to high sedimentation, the canals are loaded by silts and the tidal flow of water decreased. These 2 reason create negative externalities including degradation of water quality, which affect on yield and reduces profit to the farmers. To solve the problem, farmers are collectively digging the canals as everybody can get water access. They contribute labour as well as money.

**2. Objectives:** To study the determinants of collective efforts on managing the common property brackish water for shrimp farming.

### 3. Methodology:

**Data Collection:** Data have been collected from 185 shrimp farmers. Of them, 120 farmers are tail enders. In principle, collective action works where individuals have mutual interests. So, 120 farmers are taken as sample for this study.

**Data Analysis:** Censored regression or Tobit model has been followed.

- The dependent variable Y, collective efforts = the monetary value of labour + money contributed for collective work (households who do not pay any money, in that case Y=0).
- The expected explanatory variables are age (x1), year of schooling (x2), no. of family labour(x3), share of non-farm income (x4), farm size (x5), distance from water source (x6), number of members of the group (x7), payment to neighbour (x8) and involvement in NGO (x9).

**Equation:**  $Y = b_0 + b_1x_1 + b_2x_2 + b_3x_3 + b_4x_4 + b_5x_5 + b_6x_6 + b_7x_7 + b_8x_8 + b_9x_9 + U_i$

**4. Results:** It is found that education, land holdings and involvement in NGO of the shrimp farmers contribute positively in collective action. Group size should not be too large. In this analysis, group size is taken as dummy variable as 1, if group size is < 30 and 0, if >30. It is also found that share of non-farm income is more in total income, then farmers are not willing to come forward for collective action. Age of the household head and distance from water source are influence negatively though they are not significant.

**Table 1: Tobit Results for Determinants of Collective Action**

Variable	Coefficients	Standard error	t-value	P{ Z >z}
Age	-13.08	8.72	-1.499	.1338
Education	49.19	28.44	1.729	.0538
No. Of family labour	34.64	14.25	2.431	.2580
Share of non-farm income	-.002	.0012	-1.829	.0574
Farm size	54.59	18.25	2.99	.0028
Distance from water source	-.15	.301	-.515	.6065
Group size	16.66	24.52	.679	.0149
Paying neighbour	265.02	253.55	1.045	.2959
Involvement in NGO	1.54	1.29	1.184	.0362

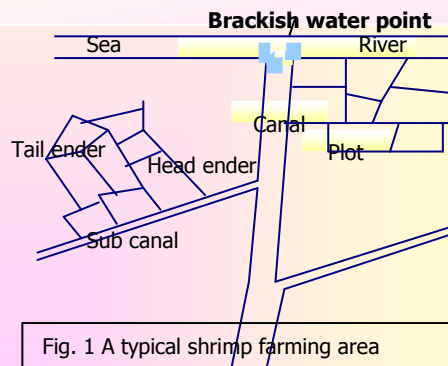


Fig. 1 A typical shrimp farming area



Fig. 2 In 1960s, govt. constructed coastal embankment\*



Fig. 3 Poor management by locals (from 1970 to now)\*



Fig. 4 Local people repairing dam collectively\*

**5. Conclusion:** From the above discussion, it is found that individuals cooperate less when he is less educated, farm size is small and non-farm income share is more than farm income. Involvement in organization is also an important factor. Similarly, smaller groups cooperate more. Members of larger groups sometimes divided into smaller subgroups that interact badly with each other.