

Research Title: Changes of Cropping Systems and its impact on soil salinity and other nutrient elements: A village level study in coastal Bangladesh

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Place of Fieldwork: Bangladesh

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Key words: Shrimp, Rice, Cropping System, Plant nutrients and Bangladesh

- Research background

In the recent decades Bangladesh is experiencing a rapid conversion of rice fields into shrimp farms and causing major changes in land use/cropping system in coastal area. The shrimp culture needs saline water and this water is kept in the field for at least six months, thus it increases the salinity level of the field. This salinity causes unfavorable environment and hydrological situation that restrict normal crop production throughout the year. Observations in the recent past indicated that due to increasing degree of salinity of some areas and expansion of salt affected area as a cause of further intrusion of saline water, normal crop production becomes more restricted (Haque, 2006). However, in the present study area, the shrimp is cultivated during the month from May to November and then the winter season rice (locally called *Boro* rice) is cultivated from the month of December to April. The presence of shrimp during the monsoon season may cause the increasing of salinity level of the rice field and thus restrict the nutrient uptake by the *Boro* rice plant and finally could reduce the yield of the rice.

- Research purpose and aim

The present study aims to find out the impact of salinity level on different plant nutrients elements as affected by the changed cropping systems

- Results and achievements by fieldwork

The findings indicate that the soil salinity (electrical conductivity) is higher (5.77 ds/m) for shrimp-rice system than rice-rice system (3.1 ds/m). Organic matter contents for shrimp-rice system is comparatively higher than only rice system whereas the total N availability is almost similar for both the shrimp-rice and rice-rice system. The Phosphorus status in shrimp-rice system is rather low to medium whereas in rice-rice system it varied from medium to optimum level for the rice production. The potassium content is rather very high for both of the systems. However the status of Calcium, Magnesium, Sulphur and Boron is very high for both of the system whereas the Zinc status of the soil is optimum for both of the systems.

- Implications and impacts on future research

Through the present research work in the coastal area of Bangladesh I have learned how to collect soil and water sample from the research area and how to analyze these samples. The local farmers would be more concerned about their cropping system as it could have some negative impact on some nutrients availability for rice production and may be the will find a better cropping system.



Picture 1. Collection of Soil Sample from a rice field



Picture 2. Collection of ground water sample



Picture 3. Salinity measurement at BAU Soil Science Laboratory