Impact of salinity on Shrimp-prawn farming, household food consumption and nutritional outcomes of adolescent girls at different agro-ecological landscape in Bangladesh

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Statement of the Problem:

Aquaculture is well established for ensuring food security, economic development, improved nutrition and poverty alleviation. But the shrimp and prawn farming issues due to socio-economic and environmental degradation require further consideration. However very little effort has been given to provide a holistic scenario of shrimp-prawn farming and its direct and indirect impacts on food and nutrition security in LIDCs including Bangladesh. This multi-disciplinary work was aimed at identifying the existing farming systems at different agro-ecological landscapes in the south-west coastal seafood farming area in Bangladesh and its impact on community food security.

Methodology & Theoretical Orientation:

On the basis of surface water salinity level, the shrimp-prawn farming areas were divided into four different agro-ecological zones: (high saline (HS)>10ppt, medium saline (MS)<10>5, low saline (LS)<5ppt; freshwater (FW) area 0ppt). In depth survey both in farm and household level were executed. Social well-being categories (better-off and worse-off) were practiced according to Haque (2007). The criterion for selection of households was having at least one unmarried adolescent girl (10-18 years old). 24hrs foods recall method and food frequency questionnaire were developed and administrated with two replications and the anthropometric data height, weight, age, sex, MUAC were collected to address the preparedness for critical 1000 days issues. Blood samples from finger tips were collected and dried on a sample pad to identify the n-3 fatty acid level being one of the vital biomarkers to address the adolescent health outcomes that are mostly related to seafood consumption.

Findings:

About 57 different species were commonly available and tiger shrimp, speckled shrimp, mud crab, freshwater prawn are the main export commodities that varied from 20-48% in terms of volume and with the rest being consumed locally and regionally. Rice and about 22 varieties of dyke vegetables are available and main items are gourd, cucumber etc (Mamun et al, 2014). In terms of volume, 20% fish, 60-80% rice and 5-10% vegetables were consumed at household level and the rest of them are destined for local, regional and international markets. Regarding the intra-

household allocation of fish consumption of adolescent girls these ranged from 80-148g/day while the household head father consumed 123-205g/day. The BMI and MUAC values of the adolescent girls were in the acceptable range. The n-3 long chain PUFA in the whole blood samples of adolescent girls were gradually decreased from higher saline to lower saline areas however there was no significant differences between better off and worse-off segment in the same agro-ecology. The omega-3 index (Harris, 2007) in higher saline areas were in intermediate stage however adolescent girls in the lower saline areas were in undesirable stage (Fig 1). The n-3 long chain PUFA ratio total PUFA (Land 2003) were also followed the same trend across the agro-ecologies. These findings are quite different as most previous assertions are based on poorly generalisable 'worst case' scenarios (Murray et al. 2013). This paper attempted to consider the aquatic and terrestrial diversity and its impacts on household consumption and nutritional outcomes of vulnerable adolescent girls.

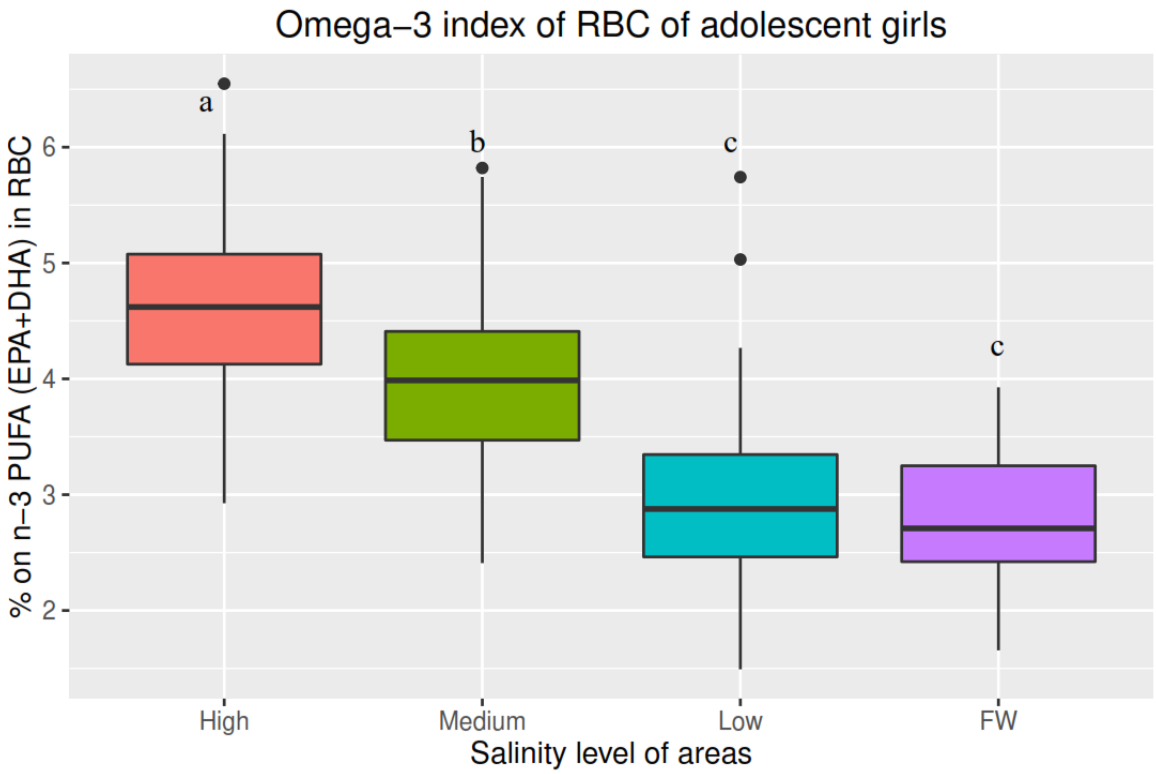


Figure 1 % of total n-3 PUFA (EPA+DHA) in RBC of adolescent girls (10-19 years) across the saline gradients of the aquatic farming system in S-W Bangladesh

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Mamun has his expertise in aquaculture system and its impact on food & nutritional security on seafood farming communities. Shrimp-prawn farming across the agro-ecologies in Bangladesh has given a new insights of the system and indicated that it is a family driven small scale polyculture system where cash crops provided higher economic return and other co-products supplies a substantial amount food fish in the domestic markets of Bangladesh. Omega-3 index of unmarried adolescent girls were in intermediate (Harris 2007) stage in higher saline areas while undesirable in lower saline areas agro-ecologies. The intra-household food allocation disparity still exist across the agro-ecologies and social well-being where the adolescent got the minimum share of food. A metric is being developed to understand the impact of aquaculture intervention on health outcomes based on these research works.