

## **Livelihood Adaption to Climate Change Project - Outcomes and interim technical lessons learned from field testing of specific adaptation practices**

***Homestead Gardening:*** It was profitable for 75% farmers – the costs were higher for the increased use of chemical fertilizers but the production and productivity compensated the investment. The use of irrigation in the control plot was lower, and no pesticides were applied in the demonstrations' plots, less amount of irrigation used, and high rate of organic fertilizer used were found in case of demo plots. Somewhat high amount of chemical fertilizer was applied in case of demonstration plots. The option is recommendable.

***Transplanted Aman:*** It was profitable for most of the farmers, including marginal and small farmers (eg: during Kharif 2 2008 it was profitable for 90% small farmers). Kharif II demonstrated a reduced need of energy for irrigation on the demonstration plots compared to control plots: a lower need of water (more rational use) implies a higher resilience to water-related stresses (both for saline prone and drought prone areas). Although in all the demonstrations the farmers used organic fertilizers reducing also the use of chemical fertilizers, about 50% farmers of saline irrigated area applied pesticides. The option is recommendable.

***Rice-fish cultivation:*** It was profitable in both saline rainfed and saline irrigated areas and data show that it is recommendable for all categories of farmers (marginal, small, medium). Due to the low irrigation needed during Kharif II the option increases the resilience to water-related stresses in saline irrigated and saline rainfed areas, considering both rice and fish together. The impact of the limited but significant substitution of chemical fertilizer with organic fertilizers would require a precise study.

***Jujube Gardening and fruit tree plantations:*** Comparing the costs with traditional techniques, the option is on average more expensive. Nevertheless, the increase of costs depends on a more rational use and on the quality of the agricultural inputs: the harvest of fruits will show to what extent the initial investment makes the pilot CCA option demonstration profitable. The not positive results in terms of profit (due to marketing conditions and lack of results – fruits) can be compensated, in the context of climate change, by the use of lower amount of water and lower frequency irrigation. Also, the option is highly environmentally friendly due to its low GHG emission and potential to sequester carbon in biomass.

***Fish rearing in the mini ponds:*** The economic returns were not always sufficient to recover the investment costs; also, the fish gets very short time to grow in the mini pond due to water scarcity during the drought season. However, the impact on food security (nutrition) is positive, as the increased nutritional intake can compensate the investment. Moreover, unless the capacity of the ponds is increased and the selection of the sites allows the farmers to control the ponds, the option is not suitable in the context of climate change as the mortality rates are too high (low resistance of the fish to high temperatures of water). Nevertheless, ponds remain a useful tool to increase the irrigation capacities in drought prone areas and potentially also in coastal saline areas (where it has not been implemented).

***Duck rearing:*** Although its costs are higher compared to the control traditional technology (mainly for vaccination and feedings) and the profits generated by the only sales of ducks are lower, the sustainability of the income generation is higher due to increased productivity

(+7.5 eggs per duck per month, equivalent to around 50 BDT) and decreased rate of mortality (-21.6%). A slight difference is observed between irrigated and rainfed drought prone villages: the profitability is higher in irrigated villages. Although the increase/improvement of feedings, the vaccinations and the construction of the housing imply an additional cost for the farmers, in the long run the resistance of the ducks to climate related stresses and diseases more in general is higher. The impact of small scale poultry on GHG emissions has to be studied (livestock is one of the highest contributors).

***Improved Cooking Stoves (ICS):*** The option is ideal although the establishment cost is high. The poorest farmers can save significant amounts of related costs every day through reduction of purchase of fuel wood from market and time savings for cooking favouring the involvement of women to be engaged in other activities. This option directly helps to add biomass to the soil by using reduced amount of cow dung, dry leaves and other organic materials as organic fertilizer. It helps to reduce directly deforestation by using less amount of fuel wood. Moreover, it is an ideal option as it also contributes reducing the GHG emission by reducing smoke and reducing cooking time.