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Sustainable food and nutrition security using humannutrition enriched crop based cropping pattern: An eco-friendly and profitable approaches

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Abstract

The main challenge of the new millennium is to increase per unit production by at least 50% and to match food production with increasing population and changing climate. There is very little scope of increasing cultivable land horizontally but there is some scope for increasing cropping intensity up to four hundred percent by improving the existing cropping pattern through introducing nutrition enriched pulses, oilseed and vegetables, short duration as well as low input used crops like mustard, lentil, garden pea, wheat, potato, mungbean and T. Aus rice into the rice based cropping pattern.

A field experiment was conducted at the Regional Agricultural Research Station of Bangladesh Agricultural Research Institute (BARI), Jessore, Bangladesh for four consecutive years (2012 to 2016) to evaluate the agronomic performance and economic return of improved cropping patterns in comparison with the current practice, with the aim of increasing cropping intensity as well as food and nutrition security through crop intensification in this rice based cropping system.The experiment comprised treatments with the following cropping patterns: CP1=Transplanted Aman rice (BINA dhan-7)– Mustard (BARI Sarisha-14) -Mungbean (BARI Mung-6)– Transplanted Aus rice (Parija); CP2 = T. Aman- Potato (Diamant) - Mungbean-T.Aus ; CP3 = T. Aman– Gardenpea (BARI Motorshuti-3)– Mungbean –T. aus ; CP4 =T. Aman- Lentil (BARI Masur-7)- Mungbean-T.Aus; CP5 =T. Aman- Wheat (BARI Gom-26)-Mungbean-T.Aus and CP6 = T. Aman – Fallow – Boro rice – Fallow (Traditional practice). The experimental design was RCB with four replications.

The results showed that the average highest rice equivalent yield (REY) were obtained in CP2 (20.23 tha-1, 44.23%), CP3 (18.57 tha-1, 39.67%), CP4 (18.37 tha-1, 38.32%), CP1 (13.19 tha-1, 13.89%) and CP5 (13.14 tha-1, 13.70%) compared to farmer's pattern CP6 (11.29 tha-1), respectively due to inclusion of potato, gardenpea, lentil, mustard, wheat and also mungbean.The average highest marginal benefit cost ratio (MBCR) 2.34, 1.80 and 1.35 with highest systems profitability of BDT 474, BDT 432 and BDT 378 per hectare per day were obtained from the cropping pattern CP4, CP3 and CP2, respectively. The average highest production efficiency 66.66, 66.63, 63.56 and 55.32 kg ha-1day-1 were recorded from the cropping patternCP2, CP3, CP6 andCP4, respectively. The average highestsustainable yield index 82.20%, 74.51% and 72.52% were recorded from the cropping pattern CP2, CP3 and CP4, respectively.

Therefore, potential adoption of these improved cropping patterns intensifying mustard, potato, gardenpea, lentil,wheat and also mungbean in rice based cropping system would generate employment and additional income for the rural poor and save foreign exchange through producing more of these crops without any ecological imbalance. So, it is clear that these improved cropping patterns suggest a great opportunity to increase cropping intensity and ensure sustainable food and nutrition security especially in the context of Bangladesh.

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