The study was conducted in Central Brahmaputra Valley Zone of Assam using a multistage random sampling technique. A sample of 225 farm households of four size groups viz. marginal, small, medium and large were selected for the study. The primary data were collected from the selected respondents by personal interview with the help of a set of pre-tested schedule and questionnaire pertaining to the year 2010-11. It is obvious that agriculture is a diversified field of activity which encompasses a number of farming activities, viz. crops, animal/birds rearing and homestead plantation. Combination of one or more enterprises with cropping when carefully chosen planned and executed (selection of proper mix and judicious allocation of
scarce farm resources) provide greater dividends than single enterprise especially for marginal and small farmers with large surplus farm labour and big human force. The term of alternative farming is associated with different farming alternatives available to farmers with farming diversification. Thus to improve the standard of living of farmers and to stabilize the income flow, diversification of crops and enterprises emerges as a major strategy. The present study is confined to the alternative farming system with diversification within agricultural, i.e., combination of crop and livestock enterprises which increases the farm's net income and employment generation. A deterministic linear programming model was used as an analytical tool for optimizing resource use. Tabular analysis, Cobb-Douglas production function analysis, BCR technique and 10 point scoring table were carried out for substantiating other objectives of the study.

The average size of land holding for marginal, small, medium and large farmers were found to be 0.78, 1.07, 2.01 and 4.00 hectares respectively. In the existing farm plan, the cropping intensity for marginal, small, medium and large farmers were 175.64, 170.09, 161.19 and 150.25 per cent respectively; while on an average it was 158.27 per cent of the study area.
Thus, it was found that the over-all cropping intensity was higher than the state average 146.05 per cent in 2009-10. But they are maintaining a very low level of livestock/birds enterprises in the existing plan.

The proportion of income generated from various enterprises revealed that highest income was contributed by field crops (61 to 73 per cent), followed by livestock/birds (21 to 33 per cent) and plantation crop (3 to 5 per cent) to the total farm income in different category of farmers. Highest net return was realized from paddy, the amount being 40.84, 43.60, 39.62 and 43.82 per cent of the total net return for the categories of marginal, small, medium and large farmers respectively. Among livestock/birds enterprise, dairy cow occupied the first position by contributing 11.47, 8.83, 23.40 and 16.91 per cent of the total net return in marginal, small, medium and large category of farmers respectively. Pigeon was accounted to be least important bird, which contributed only 2.02, 1.67, 1.03 and 0.79 per cent of the total net return in marginal, small, medium and large category of farmers respectively.

There were 181.41, 285.77, 533.20 and 1025.06 mandays employed for marginal, small, medium and large farmers respectively, which was below the availability of 503.31, 552.41, 763.52 and 1259.10 mandays for the
respective categories. Field crops absorbed the maximum human labour in each category of farmers as it was the major component of farming. In case of crop enterprise, the proportionate shares of all the categories of farmers were above 71 per cent but in case of livestock, the utilization was just the opposite from 16 to 23 per cent among the all category of farmers.

Among six major farming system identified, FS 02: crop + dairy cow + goatery farming system was found to be the most important, which was practiced by 26.22 per cent of the sample population. It was also observed that combination of crop and dairy cow was common to each farming system. The study revealed that mixed farming was found to be prevalent in the study area, with the FS 08 crop + dairy cow + goatery + poultry farming system as the best alternative system which fetched the maximum income and also utilized highest labour in all the category of farmers.

The study also revealed that the resources were not utilized rationally by the sample farmers and there exists scopes for increasing the income and employment in the study area through resource allocation. The results of the functional analysis show that fertilizer was the most significant variable which contributed positively towards the gross return followed by family human
labour, pesticides, farm yard manure and seed. The hired human labour was found to be negative and statistically insignificant in the study area. The ratio of MVP to its MFC revealed that there exists a vast potential for increasing the gross return by increasing the levels of variables like fertilizer, pesticide, farm yard manure and seed. Family and hired human labour were overused by the sample farmers.

Optimum plans ($P_i$ to $P_e$) showed marked changes in gross cropped area, cropping intensity, net return and human labour employment over the existing plans ($P_0$) in different category of farmers. The increase in gross cropped area in the optimal plans over the existing plans of the marginal, small, medium and large category of farmers were 13.14, 20.32, 12.96 and 27.25 per cent respectively. The cropping intensity increased from 175.64 to 198.71 per cent, 170.09 to 204.67 per cent, 161.19 to 182.09 per cent and 150.25 to 177.50 per cent in case of marginal, small, medium and large category of farmers respectively. The increases in the level of human labour employment in the optimum plans of the respective category of farmers over the existing plans were 31.04, 32.19, 25.53 and 12.00 per cent respectively. Increase in net return for marginal, small, medium and large farmers were
Rs.19396.03 to Rs.28441.54, Rs.26179.18 to Rs. 38640.95, Rs.54697.45 to Rs.78466.71 and Rs.94154.75 to Rs.125195.55 respectively in the optimal plan suggested. The crops like Sali paddy HYV, summer paddy HYV, kharif pulses, rabi vegetables and potato were proved to be remunerative in all the farms and appeared in the optimal plans with a large area. Among livestock/birds activities dairy cow, goatery and poultry got major emphasis. The study established the fact that the diversification can be the best strategy for increasing farm’s net return and human labour employment opportunity.

The study also revealed that the way to diversification is not free from constraints. Lack of proper marketing facilities, lack of access of institutional credit, lack of cold storage facilities and lack of access of irrigation facilities were some of the major constraints in the study area. Proper policy implications by the government would be necessary for removing these obstacles.

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