Integrated Livestock Promotion for Poverty Assessment in Rural Areas

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Abstract: *The majority of rural households keep livestock; the rural poor, defined as those living in rural areas and belonging to the bottom expenditure quintile, are more likely to keep livestock than those in higher quintiles; there are minor differences in herd composition between households, and the contribution of livestock to total income is overall small, with no significant differences across households. It is widely recognized that expanding capacity for livestock production and marketing can be a potent catalyst for rural poverty alleviation in developing countries. Investigations were carried out in Varanasi and Chandaulidistrict to find out a sustainable mixed farming model which is economically viable integrating the different component like crop, livestock, poultry and duck on 2.0 acre land holding. Different viable modules viz. (T_1) arable, (T_2) crop + 2 bullocks + 1 cow, (T_3) crop + 2 bullocks + 1 buffaloes, (T_4) crop + 2 bullocks + 1 cow + 1buffaloes, (T_5) crop + 2 bullocks + 1 cow + 1 buffaloes + 10 goats and (T_6) crop + 2 bullocks + 1 cow + 1 buffaloes + 10 goats + 10 poultry + 10 ducks were developed to find out the best package on the land holding of 2.0 acre suitable for the tribal region. A model having 2 bullocks + 1 cow + 1 buffaloes + 10 goats + 10 poultry + 10 ducks along with crop cultivation was the best with a net income of Rs 33076 per year against arable farming (crop farming) alone (7843 per year) with a cost returns of 1: 2.238 and employment generation of 316 days.*

Keywords: *Livestock, livestock holdings, livestock income, household surveys, poverty*

1. INTRODUCTION

Varanasi and Chandauli region is mainly a mono-cropped area with Sorghum (*Sorghum vulgare*) being the main crop used for livestock feed during Kharif season. More than 80 per cent of the population is dependent upon agriculture for its livelihood. Due to mono-crop cultivation, this portion of the population remained unemployed during eight months of the year. Because of limited irrigation facility, it makes the farmers vulnerable to drought, which threatens the harvest of paddy.

The concept of man - land - livestock ecosystem is gaining momentum to maximize food production and to elevate economic status of the farmers by multifarious farm activities particularly by incorporating livestock enterprises. For human need, the livestock provides food, fiber, skin, traction, fertilizer and fuel. Livestock also constitutes "living bank" providing flexible financial reserve in times of emergency and serve as "insurance" against crop failure for survival. Farmers keep cows, buffaloes, sheep and goats including small numbers of poultry in backyard to meet their domestic needs. Therefore, livestock became an integral part of farming system as such. Other agricultural components like horticulture, plantation, vegetables, sericulture, agro-forestry are also prevalent in the homesteads. These units are operated either alone or in combination depending upon the size of the farm holdings and other available resources. In this system, animals are raised on agricultural waste. The animal power is used for agricultural operation and the dung is used as manure and fuel. It may be possible to reach the some level of yield with proportionately less input in the integrated farming and the yield would be inherently

more sustainable because the waste of one enterprise becomes the input of another leaving almost no waste to pollute the environment or to degrade the resource base. To put this concept into practice efficiently, it is necessary to study linkage and complementary of different enterprises will help to develop integrated farming system in which the waste of one enterprise is more efficiently used as input to another within the system.

2. MATERIALS AND METHODS

The present study was conducted in Uttar Pradesh plains of Varanasi and Chandauli district comprising 12 blocks. Three villages were randomly selected from each block. In this way, 36 villages were randomly selected from each block. Average farm size holding in Varanasi and Chandauli district is about 2.0 acre. Therefore, the same fragmented area of land (2.0 acre) was chosen for small farmers. A family size of 5 members parallel and identical to that of Varanasi and Chandauli farmers has been considered in this model. To ascertain the best model suitable to 2.0 acre farm size holding a set of 6 combinations with crop (grains, fodder) livestock (cow, buffalo, bullock, goat poultry and duck) farming's were considered. The crop farming consisted of grains and fodder cultivation in Kharif (June - August) and rabi (September - November) season under rainfed condition.

3. RESEARCH METHODOLOGY

Information was collected by personal interview, the details regarding land holdings, size and kind of livestock, family labour size, expenditure for crop farming and livestock enterprise and annual income from agriculture and from livestock was gathered from the randomly selected respondents. To calculate the net margin, various cost concepts used for the livestock and crop farming were as follows.

- Livestock farming - Paid out expenses like feed cost, hired labour, medicines, computed value of family labour and miscellaneous recurring expenses.

- Crop farming - Paid out expenses like hired human labour, bullock labour, tractor hour, cost of seed, manure, fertilizer and computed value of family labour.

The modularly treatments formed under marginal farmers having 2.0 acre land holding are given in Table 1.

Table 1. *The different treatments*

S.No.	Treatment
T_1	Crop (2.0 Acre)
T_2	Crop + 2 Bullocks + 1 Cow
T_3	Crop + 2 Bullocks + 1 Buffalo
T_4	Crop + 2 Bullocks + 1 Cow + 1 Buffalo
T_5	Crop+2 Bullocks + 1 Cow + 1 Buffalo + 10 Goats
T_6	Crop + 2 Bullocks + 1 Cow + 1 Buffalo + 10 Goats + 10 Poultry + 10 Ducks

The numbers of livestock including poultry and ducks have not been put to different modules as per the existing practices of farmers, rather they were put on the basis, required to make the mixed farming module viable to achieve the maximum returns. Livestock comprised of cows, buffaloes, bullock, pigs and goats besides poultry and ducks. The livestock and poultry birds included in the present study were indigenous and non-descript type.

4. RESULTS AND DISCUSSION

The results of this study have indicated that integration of various enterprises on 2.0 acre size of land holding were viable (Tables 2 and 3).

Table 2. *Income and expenditure due to Crop Farming (Mean±SE)*

S.No.	Crop	Area, Acre	Expenditure, Rs	Gross Income, Rs	Net Income (Rs)	Cost : return ratio	Employment days
1	Sorghum (*Sorghum vulgare*)	1	6092±42.75	9965 ±24.78	3873±51.25	1.63 ±0.012	80±0.74
2	Wheat (*Triticumaestivum*)	1	4300±45.11	6863 ±13.41	2563 ±46.03	2.09 ±0.017	41±0.65
3	Lakhdi (*Lathyrus sp.*)	1	2172±34.97	3528 ±32.02	1356 ±44.43	1.62 ±0.02	30±0.50

Table 3. *Income and expenditure due to Livestock Farming (Mean ± SE)*

S.No	Particulars	Cow	Buffalo	Bullock	Goats	Poultry	Ducks
1	No.of Animal	1	1	1	10	10	10
2	Expenditure, Rs	2153±10.96	2421±7.16	2185±4.91	1953±8.53	651±5.75	953±7.86
3	Gross Income, Rs	5354±10.74	9699±17.15	3755±9.16	9891±4.91	2250±6.98	3030±5.27
4	Net Income, Rs	3201±14.04	7277±10.59	1570±10.14	7938±2.07	1599±6.83	2077±10.2
5	Cost return : ratio	2.48±0.01	4.00±0.01	1.71±0.01	4.68±0.01	3.45±0.03	3.18±0.03
6	Employment days	35.2±0.23	35.2±0.57	45±0.55	35.2±0.55	8±0.29	8±0.25

Further, better utilization of land, water, input and output resources have been observed in the mixed farming model with bullocks, cows, buffaloes and goats as compared to arable farming alone (Table 4 and Figure 1).

Table 4. *Income and expenditure of different mixed farming modules for Marginal Holder (Mean ± SE)*

S.No	Treatment	Expenditure, Rs	Gross Income, Rs	Net Income, Rs	Cost :return ratio	Employment days
T$_1$	Crop (2.0 Acre)	12396[a]±83.37	20239[a]±63.42	7843[a]±93.29	1.63[a]±0.01	165[a]±2.05
T$_2$	Crop + 2 Bullocks + 1 Cow	18920[b]±81.74	33104[b]±52.90	14184[b]±93.25	1.75[b]±0.007	273[b]±1.15
T$_3$	Crop + 2 Bullocks + 1 Buffalo	19188[c]±85.27	37449[c]±54.47	18260[c]±92.76	1.95[c]±0.008	273[b]±1.02
T$_4$	Crop + 2 Bullocks + 1 Cow + 1 Buffalo	21341[d]±82.60	42803[d]±51.26	21462[d]±92.04	2.00[d]±0.007	291[c]±0.99
T$_5$	Crop+2 Bullocks + 1 Cow + 1 Buffalo + 10 Goats	23294[e]±80.56	52695[e]±52.06	29400[e]±89.96	2.26[e]±0.007	308[d]±0.98
T$_6$	Crop + 2 Bullocks + 1 Cow + 1 Buffalo + 10 Goats + 10 Poultry + 10 Ducks	24899[f]±79.40	57975[f]±54.69	33076[f]±90.84	2.23[f]±0.007	316[e]±0.90

Values with different superscript in the same column differ from each other significantly (P<0.01)
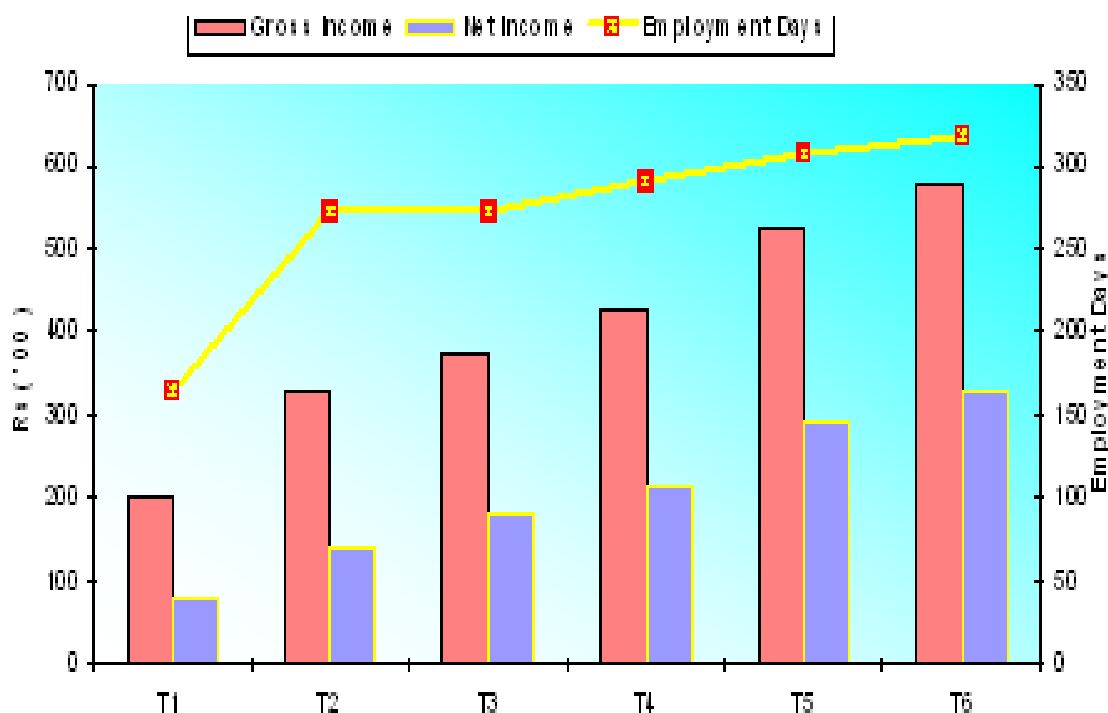
Figure 1. *Income and expenditure in different mixed farming models for marginal small-holder*

Mixed farming of 2 bullocks + 1 cow + 1 buffaloes + 10 goats + 10 poultry + 10 ducks gave a net return of Rs 33076 compared to Rs 7843 from arable farming. Singh (1994) reported that 1ha canal irrigated land gave net return ranging from Rs 14000 to Rs 32700 in different years in mixed farming with 3 crossbred cows. Whereas, it was observed to be ranging from negative to Rs 19700 in mixed farming with 3 buffaloes. Comparative figures for arable farming were between Rs 3300 and Rs 12400 (Singh 1994). MadhavaSwamy (1985) observed that the net returns were higher by Rs 620, 5198 and 1598 in diversified farms of farming, poultry and sheep rearing, respectively over the crop enterprise farm in Karnool district of Andhra Pradesh. Singh (1994) compared three types of farming system and found that the mixed farming with 3 cross bred cows gave the highest net return of about Rs 21,000 and also generated highest man days of employment.

Agriculture is still considered the major sector providing employment in India (Singh 1994). However, the small and marginal farmer families and agricultural labourers have to face employment and under employment due to seasonal work in crop production (Swaminathan 1981) and also due to the natural calamities occurring at one or the other seasons of the year. In this study too, the mixed farming system suggested better means for providing regular employment to these sections of rural mass in tribal area. The study revealed that employment potential of mixed farming system was higher than arable farming. In a mixed farming system of 2.0 acre land, the employment generation was 316 man days with almost uniform distribution throughout the year compared to 165 man days in arable farming with more labour employment only during July-August period of agriculture operations.

Ramrao et al (2005) developed a mixed farming (crop-livestock) module of 2.0 acre small scale holders with the employment generation of 571 man days, net income of Rs. 58456 per year against crop farming alone with employment generation of 385 man days and net returns of Rs. 18300 per year only.The conservation of ecosystem and recycling of energy and mineral matter in soil-plant-animal/human- atmosphere have been followed by Singh (1994). The recycling of precious organic manure wastes (energy/mineral matter) might have been responsible for conserving ecosystem and thus increasing the fertility of soil and keeping the environment free from pollution hazards. In view of the pressure of population on land there is no alternative to meet the demand for food and other agricultural raw materials except through increase in agriculture- animal production per unit land per unit time on one hand and concern of humanity regarding pollution and environment on other.Good amount of feed for animals was also available

from the system itself. The farmyard manure available from the animal was used for manure of crops and 30-35% savings in fertilizer use could be affected in mixed farming system.

5. CONCLUSIONS

From the study it is concluded that integrated farming system with 2 bullocks + 1 cow + 1 buffaloes + 10 goats along with other subsidiaries like poultry and duck is the most beneficial system which can augment the income of farmers to improve their socio-economic status. More emphasis is still required to generate a generalized model suited to various farm size holdings in different agro climatic conditions.

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