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Prospect and possibility of doubling farmer's income: A case study in Central Brahmaputra Valley Zone of Assam, India

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Abstract

A study was carried out to view the prospect and possibility of doubling farmers' income. For this purpose, bench mark information on crop cultivation and production were collected in the year 2017 from a village 'Diphalu' (26.365 °N and 92.709 °E) in Nagaon district of Central Brahmaputra Valley Zone, Assam, India. A total of 42 agricultural farmers *i.e.* 30% of household were randomly selected from each farm group - marginal, small, medium and large of the village. The collected information were simulated with recommended package of practices and diversified / and intensified the crop enterprises with feasibility and validity. The analysis pointed out that with recommended package of practices of Assam in same operational cropped area of existing cultivation, farm income increased by 42.61%. On the contrary the farm income would be increased by 81.96% over existing situation after increasing cropping intensity to 209.78% from 180.43%.

Keywords: Double income, feasibility, diversified/intensified, package of practices, farm group

Introduction

The income of a farmer mainly depends on the productive activities. The activities may be of agriculture, industry, commerce or tertiary. Agriculture is the backbone of Indian economy where more than 70 percent populations are engaged in agriculture and allied activities. Agricultural activities should be rightly streamlined to earn more return in the stipulated time frame. It is a big and challenging task for the farming community as a whole. The general characteristic of Assam due to common use of traditional farming practices, low growth in productivity as well as income sector, widespread prevalence of subsistence cultivation etc. About 86 percent of population lives in country sides and 58 percent of state population is directly or indirectly depend on agriculture out of which 38 percent of workforce engaged in different activities (2011 census). Out of total workforce 26.22% were cultivators and only 7.54% were agricultural workers. However, different crops available in study area were considered, where the productivity of Assam recorded of those crops in 2014-15 were rice - 21.42 q/ha, pulses - 7.49 q/ha, oil seeds - 6.70 q/ha and jute (*Corchorus spp*) - 21.50 q/ha (ref). The level of production was comparatively low as compared to national averaged yield except pulse (Anon. 2016) [4]. Total food produced during the period (2014-15) were 53.51 lakh metric tonnes whereas total requirement were 52.64 lakh metric tonne. As per Govt. of Assam report, it is clear that total production of wheat, pulse and oil seed is below the total requirement (Economic survey, 2015-16). To increase the production of pulses and oil seeds, acreages may be increased during *Rabi* season. It is possible as sufficient area during *Rabi* season laying fallow after rice. Those rice fallow lands may be intensified the cropping system that helps to produce more food products leading to double farm income to the farming community. The deficit of pulses and oilseeds may be minimized by means of adopting and inculcate the different technologies at different steps. By considering the above hindrance to make farmers' income double from the limited resources, it is simulated the crops enterprises through possible ways. This study was undertaken to examining with an objective to make double farm income.

Methodology

The study was conducted in purposively selected in the revenue village ‘Diphalu’ (26.365 °N and 92.709 °E) located at Nagaon district of Assam, India. In the selected village total numbers of population were 1029 (1000: 750 sex ratio) with 140 numbers of agricultural households. A list of the farm households were prepared and redistributed to get the farm groups of marginal (0-1.0 ha), small (1.0-2.0 ha), Medium (2.01-3.0 ha) and large (>3.0 ha) according to their operational holdings. A sample of 30% households was selected randomly from each farm group. This gave a total sample of 42 households for collection of primary basic data.

The break ups of households are

Farm size	Households Number
Marginal	11
Small	14
Medium	10
Large	7
Total	42

For determining the input-output coefficients, product mix, yield farms were asked different questions regarding major crop cultivation by interview method with the help of testing schedule and recorded accordingly. In this context, yield and other information were collected for the major crops like rice, jute, rapeseed and mustard, pulse (Black gram) from Regional Agricultural Research Station, AAU, Shillongani, Nagaon, Assam, India cultivated with recommended package of practices of Assam. The research data were stimulated with existing farm information of the village to achieve the goal.

Further, these data were processed and analyzed with appropriate statistical tools.

Limitation of the study

1. For crop cultivation climatic conditions are assumed to be normal.
2. The study is restricted to 30% of the farm households.
3. Time and cost are the factors which have limited the size of the sample.

Results and Discussion

Results were discussed with the following heads

1. Existing farm situation:
 - a) Existing cropping pattern of the respondents
 - b) Existing income of an average farm (Plan I)

2. a). Cultivation with package of practices in existing situation (Plan II),
 - b). Cost of cultivation of cultivated crop enterprise
3. Intensification and diversification of crops (Plan III)
4. Comparative analysis of plans.

1. Existing farm situation: The land situations according to revenue report are 15, 20, 50 and 15 percent are high, medium, low and very low respectively (Fig 1). During *Rabi*, *Summer* and *Kharif* seasons different crops may be practiced easily. Most of the area is under low and very low situation (65%). Cultivation of rice in both seasons (*Summer & Kharif*), Jute in *summer* season can grow with little effort. Rapeseeds and mustard is the common crop among the farmers during *Rabi* season. The analysis of samples would provide the representative cropping pattern of the farmer in the village as a whole.

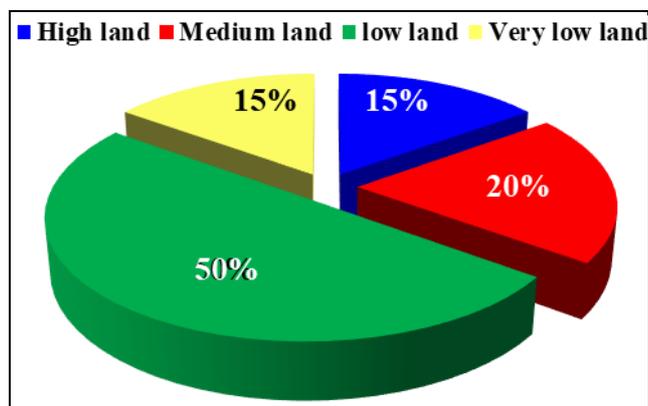


Fig 1: Land situation of study village

a). Existing cropping pattern of the respondents: The average operational area of a farm was 1.84 ha where as the existing gross cropped area was found to be 3.32 ha (Table 1). The cropping intensity (CI) was found to be 180.43 percent. Local rice in the cropping system is the most dominant crop covers the maximum area of 1.25 ha followed by summer rice 0.78 ha of gross cropped area. Local *Sali* rice, HYV *Sali* rice, *Summer* rice, Jute and Rapeseeds and mustard are the existing cultivated crops. Apart from these pulses, deep water rice and vegetables occupied very negligible acreage, so these crops were not taken into consideration.

Table 1: Existing Cropping Pattern of the Village (Area in Hectare)

Farm size	No. of Family	Av. Member	Operational Area	Gross cropped area						Cropping Intensity (CI)
				Local Sali rice	HYV Sali rice	Summer rice	Jute	Rapeseed and Mustard	Others (pulse)	
Marginal	8	3	0.50	0.45	0.03	0.03	0.13	0.23	-	215.56
Small	9	4	1.31	1.03	0.09	0.21	0.13	0.40	-	141.98
Medium	7	5	2.34	1.82	0.54	0.93	0.29	0.52	-	179.48
Large	4	4	3.21	1.70	1.38	1.85	0.69	0.55	-	192.21
Total	28	16	7.36	5.00	2.04	3.12	1.24	1.80	-	
Average	-	4	1.84	1.25	0.51	0.78	0.31	0.45	0.02	180.43

b). Existing income of an average farm (Plan I): In plan I, it is clear from table 2 that local *Sali* rice covers the substantial area (1.25 ha) out of the total cropped area 3.32

ha. With the existing crop management with minimum effort production and yield are not upto the mark as compared to the state average. With this gross income from

this crop enabled to get Rs. 1,61,435.00 from the cropped area. On the other hand, total cost (excluding land revenue and fixed cost) is Rs. 88,169.00. So, the total net income

become Rs. 70,266.00 and BC ratio for different crops varied from 1.53 (*Sali* rice) to 2.29 in rapeseed and mustard.

Table 2: Income of an Average farm in Existing situation (Plan I)

Crop Enterprise	Cropped area (ha)	Production q/ha	Gross Income (Rs.)	Total Cost (Rs.)	Net Income (Rs.)	BC ratio
<i>Sali</i> local rice	1.25	24.86 (19.89)	38533	25142	13391	1.53
<i>Sali</i> HYV rice	0.51	16.37 (32.10)	25373	15130	10243	1.68
<i>Summer</i> rice	0.78	36.39 (46.65)	56404	27258	29146	2.06
Jute	0.31	2.27 (17.01)	18445	10744	7701	1.72
Rapeseed and mustard	0.45	3.24 (17.20)	22680	9895	12785	2.29
Total	3.32		1,61,435	88,169	70,266	CI=180.43%

2. a). Cost of cultivation of cultivated crop enterprise: Cost of cultivation was calculated with recommended Package of Practices of Assam. It is estimated with present

market input prices, varied from Rs. 21,989.00 for rapeseed and mustard to Rs. 34,947.00 for *Summer* rice on per ha basis (Table 3).

Table 3: Cost of cultivation of cultivated crops with recommended package

Particulars	<i>Sali</i> rice	<i>Summer</i> rice	Jute	Rapeseed and mustard	Greengram	Blackgram
Seed (kg)	40	40	8	10	20	22.2
Ferti (NPK)	60:20:40	60:30:30	30:25:25	60:30:30	15:30:0	15:30:0
Irrigation		4		1	1	1
Labour(MD)	75	85	90	45	48	48
Cost (Rs.)	26,727/-	31,484/-	31,224/-	19,810/-	23,033/-	22,658/-
Bank Int. 11%	2,940/-	3,463/-	3,434/-	2,179/-	2,533/-	2,492/-
Total Cost (Rs.)	29,667/-	34,947/-	34,658/-	21,989/-	25,566/-	25,150/-

b. Cultivation with package of practices in existing situation (Plan II): With the same acreage of the each crop with existing cropping system, it is simulated with the total cost and expected yield experimented at Regional Agricultural Research Station, AAU, Shillongani, Nagaon-

782002, Assam, India. Gross income would be Rs. 2,30,223.00 in the same cropping intensity (180.43%) as well as cropped area. Net return would be increase to Rs. 1,16,613.00. Among the cultivated crops BC ratio varies from 1.67 to 2.51 (Table 4).

Table 4: Cultivation with package of practices in existing situation (Plan II).

Crop Enterprise	Cropped area (ha)	Production q/ha	Gross Income (Rs.)	Total Cost (Rs.)	Net Income (Rs.)	BC ratio
Local <i>Sali</i> rice	1.25	36.89 (29.51)	57,175/-	34,165/-	23,010/-	1.67
HYV <i>Sali</i> rice	0.51	23.00 (45.13)	35,675/-	17,340/-	18,335/-	2.05
<i>Summer</i> rice	0.78	45.02 (57.72)	69,781/-	32,592/-	37,189/-	2.14
Jute	0.31	9.05 (29.20)	31,682/-	15,220/-	16,462/-	2.15
Rapeseed and mustard	0.45	5.13 (11.40)	35,910/-	14,293/-	21,617/-	2.51
Total	3.32	-	2,30,223/-	1,13,610/-	1,16,613/-	CI=180.43%

3. Intensification and diversification of crops (Plan III): Another means to increase the farm income by diversified /and intensified the crops with feasibility and validity with full package of practices of Assam. Area under local *Sali* rice may be reduced to the requirement for daily requirement and festival *etc.*, of the farmer and those additional *Sali* rice (1.25 – 0.46) 0.79 ha may be intensified to HYV *Sali*. Likewise, the rice fallow area may be

intensified by rapeseed and mustard during *Rabi* and by Jute during *Summer* season. As pulse crops are practiced by the farmers in negligible area, so it may be diversify in cropping sequence. After simulation, it was observed (Table 5) that with the increase of cropping intensity to 209.78 from 180.43 percent (fig 2), there is an increase of gross income to Rs. 2,93,751.00 with net income Rs. 1,56,098.00 per farm.

Table 5: Diversification and Intensification of crop enterprise (Plan III)

Crop Enterprise	Gross cropped area (ha)	Production q/ha	Gross Income (Rs.)	Total Cost (Rs.)	Net Income (Rs.)	BC ratio
Local <i>Sali</i> rice	0.46	13.58	21,049/-	12,573/-	8,476/-	1.67
HYV <i>Sali</i> rice	1.30	58.63	90,876/-	44,200/-	46,676/-	2.06
<i>Summer</i> rice	0.78	45.02	69,781/-	32,592/-	37,189/-	2.14
Jute	0.46	13.43	47,005/-	22,584/-	24,421/-	2.08
Rapeseed and mustard	0.60	6.84	47,880/-	19,057/-	28,823/-	2.51
Pulse (Blackgram)	0.26	2.86	17,160/-	6,647/-	10,513/-	-
Total	3.86	-	2,72,701/-	-	1,56,098/-	CI=209.78%

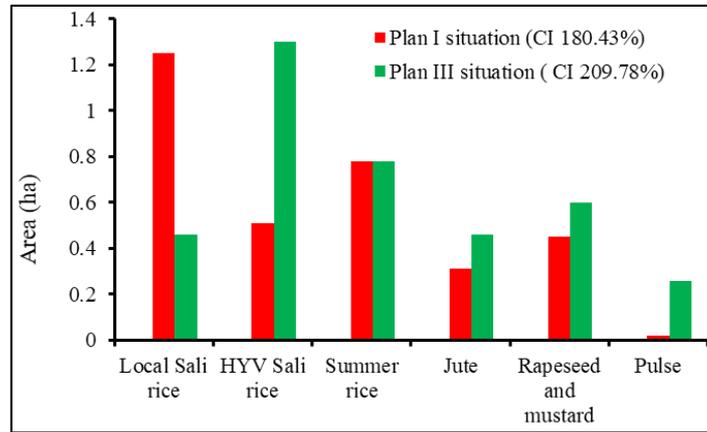


Fig 2: Intensity of gross cropped area

4. Comparative analysis of plans: In the present investigation, it has been observed that with the same gross cropped area by adopting recommended package of practices, the farmer may be able to improve 42.61 percent of gross income (Table 6). On the contrary, if the farmer

increases the cropping intensity by incorporating pulse crops in the cropping sequence gross income would be improvised by 81.96 percent over the existing situation (fig 3). It means the farmers’ enable to lead for doubling the farm income.

Table 6: Comparative Analysis of different Plans

Plans	Cropped Area (ha)	Gross Income (Rs.)	Net Income (Rs.)	% Improved of Net Income over Plan I	Cropping Intensity (%)
Plan I	3.32	161435	70266	-	180.43
Plan II	3.32	230223	116613	42.61	180.43
Plan III	3.86	293751	156098	81.96	209.78

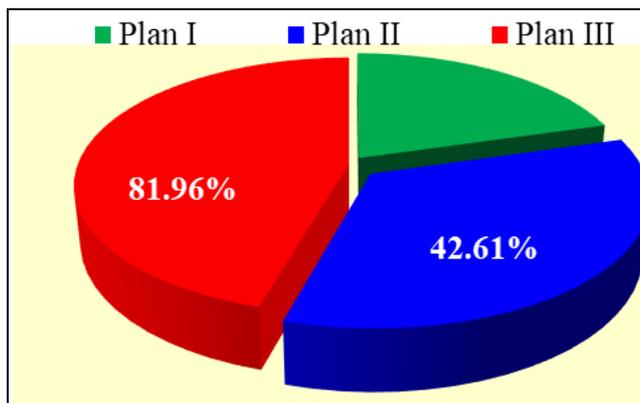


Fig 3: Percent improved of net income over Plan I

Conclusion

The challenge of doubling farmers’ income has become a consistent theme of any government communication. The opportunities which are available in increasing the farm income should properly explore to achieve the goal. For this purpose farmers should be made aware to optimal use of limited resources, adopt new technology, market intelligence, cultivation of vegetables, high remunerative crops, record keeping etc. Government should provide adequate support in marketing their produce and irrigation facilities especially in *Rabi* season. There should be direct link to the farmers’ income and a tangible increment can be obtained, improve linkage between field and fork and agricultural processing. Overall some of the following aspects should be considered for doubling farm income. Reduced the agricultural risks, increase employment in rural area, import agricultural products, institutional support of credit, marketing reforms, improve the rural agricultural infrastructure, crop insurance *etc.*, with improvise the

aspects there will be enough alternate means to help the society in general and farms in particulars.

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