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## **Farmers' Perception on Constraints in Adoption of Double Cropping in Upper Brahmaputra Valley Zone of Assam**

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### **Authors' contributions**

*This work was carried out in collaboration between all authors. All authors read and approved the final manuscript.*

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### **ABSTRACT**

**Introduction:** Out of the total net cropped area of 28.10 lakh hectares in Assam, only 1.96 lakh hectares is under double cropping despite the implementation of "Mission Double Cropping" with a fixed target of covering 2.09 lakh hectares in the state. Double cropping is not a new concept in Assam, because the cropping intensity has increased to 155.81 percent in 2013-14 from 152.29 percent in 2012-13. However, there is still some inhibitions on the part of the farmers in going for double cropping though it gives the farmers an increasing cash flow.

**Aims:** The present study was conducted to identify the major socio-economic constraints in adoption of double cropping.

**Study Design:** Original Research.

**Place and Duration of Study:** The study was conducted in Jorhat and Golaghat districts of Upper Brahmaputra Valley Zone (UBVZ) of Assam during 2016 where government programmes of double cropping are in operation.

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**Methodology:** The study was based on primary data collected through the personal interview from a sample of 120 farmers. The sample was drawn through multistage stratified random sampling technique. Constraint facing index was used.

**Results:** The study revealed the non-availability of water supply in the crop field as the major constraint faced by the highest number of farmers during Rabi season followed by a shortage of labour and stray cattle problem. Some other problems such as non-availability of credit, shortage of water supply to the crop field, high fuel cost, shortage of credit, high wage rate, transportation cost were also reported by the study as constraints in adopting double cropping in the zone.

**Conclusion:** The study suggested some measures to overcome these reported problems like ensuring adequate irrigation facilities, proper awareness among the famers regarding water harvesting, proper fencing around the field to avoid stray cattle etc.

**Keywords:** Double cropping; socio-economic constraints; UBVZ; Assam.

## 1. INTRODUCTION

Double cropping is the practice of growing a second crop immediately following the harvest of the first *kharif* crop, thus harvesting two or more crops from the same field in one year. Both economic and environmental concerns motivate the interest in double cropping [1,2]. The economy of Assam is largely rural and agrarian. Agriculture is the principal occupation of majority of the rural population in the state in terms of employment and livelihood. In Assam, there is ample scope for increasing agricultural production by raising the cropping intensity which is very low compared to some other states and India. Assam has abundant rainfall per year, yet there are very large fallow lands in post-monsoon period. The total net sown area of Assam is 28.10 lakh hectares of which farmers are using 16.22 lakh hectares for single crop. The area under mono cropping in Upper Brahmaputra Valley Zone is 4.23 lakh hectares which is 26 per cent of total mono cropped area of the state and it is very high as compared to double-cropped area (1.96 lakh hectares) according to Economic survey of Assam, 2014-15 [3]. In order to popularize growing a second crop, to improve the economic status of the farming community in general and the poverty-stricken marginal farmers, the Government of Assam has launched a mega project entitled "Mission Double Cropping" with a target fixed of covering 2.09 lakh hectares of land to be covered under mustard, pea, potato, summer paddy, coriander and hybrid brinjal. The cropping intensity of the state has increased to 155.81 per cent in 2013-14 from 152.29 per cent in 2012-13 (Economic survey of Assam 2014-15). But however, in spite of having lots of benefits from double cropping, the most of the farmers of Assam are reluctant to go for double cropping. Therefore, the present study made an attempt to identify the socio-

economic constraints in adoption of double cropping in Upper Brahmaputra Valley Zone of Assam.

## 2. METHODOLOGY

The study was carried out in the Jorhat and Golaghat districts of Upper Brahmaputra Valley Zone of Assam during the year of 2016. The study area was selected based on criteria viz., areas where double/ multi crops are grown, areas where government programmes of double cropping are in operation, the convenience of the researchers. Multistage stratified random sampling technique was used to draw a sample of 120 farmers with a population of 580 for the study. As a first stage of sampling, 1 block was selected at random from each district. In the second stage, villages where farmers grow double crops were listed out from each of blocks and two villages for each block were randomly selected. Thus a total of four villages were selected for the study. In the third stage of sampling, a list of farmers from the selected villages adopting double cropping was prepared. Then 30 numbers of farmers were selected from each village to make a sample of 120 farmers.

A pretested schedule was used to collect the necessary data from the sample farmers through personal interview method. Each of the farmers was asked to indicate the extent of difficulty caused by each of the constraint by checking any of the four responses such as, 'strongly agree', 'moderately agree', 'less agree' and 'disagree' and weight was assigned to these responses as 3, 2, 1 and 0, respectively. Constraints were arranged in a rank order by developing Constraint Facing Index (CFI) by using the formulae:

$$CFI = P_n \times 0 + P_l \times 1 + P_h \times 2 + P_{vh} \times 3$$

Where,

CFI = Constraint Facing Index

Pn = Percentage of farmers disagree

Pl = Percentage of farmers less agree

Ph = Percentage of farmers moderately agree

Pvh = Percentage of farmers strongly agree

CFI for any aspect of constraint could range from 0 to 300, 0 indicating no constraint and 300 highest constraint [4].

### 3. RESULTS AND DISCUSSION

The present study has identified total 11 numbers of social economic constraints faced by the sample farmers and listed in Table 1.

It was observed that 13.33 per cent farmers were strongly agreed and 70 per cent farmers have moderately agreed that non-availability of water supply in the crop field was a major constraint in adopting double crops during *Rabi* season.

Likewise a large per cent of farmers considered the shortage of labour, stray cattle, non-availability of credit etc also as a major constraint. Based on those responses Constraint facing Indices (CFI) were estimated and constraints were ranked (Table 2).

Non availability of water supply was found to be the major problem faced by the farmers. It was due to lack of proper irrigation facilities and no measures were taken up by the farmers for rainwater harvesting. Then, shortage of labour and stray cattle problem constituting 188.33 of CFI score each were reported as a second major constraint. Shortage of labour is a major growing concern for the state agriculture due to labour migration, implementation of MGNREGA scheme etc and making it challenging to perform crop cultivation throughout the year. Stray cattle are also highly encountered problem in Assam. Due to the scarcity of fodder crops and grazing land, peoples' negligence etc stray cattle problem is arising and harm the crop field.

**Table 1. Socio-economic constraints faced by the respondents in adoption of double cropping (In percentage) N=120**

Sl. no.	Constraints	Strongly agree	Moderately agree	Less agree	Disagree
1.	Non availability of water supply	13.33	70.00	11.67	5.00
2.	Shortage of labour	12.50	69.17	12.50	5.83
3.	Stray cattle	12.50	69.17	12.50	5.83
4.	Non availability of credit	10.00	62.50	13.33	14.17
5.	Shortage of water supply	10.83	59.17	14.17	15.83
6.	High fuel cost	12.50	55.00	10.83	21.67
7.	Shortage of credit	12.50	55.00	10.83	21.67
8.	Non availability of labour	11.67	51.67	13.33	23.33
9.	Non-adequate demand in the nearby area	14.17	45.83	10.00	30.00
10.	High wage rates	10.00	49.17	12.50	28.33
11.	High transportation cost	10.00	49.17	12.50	28.33

**Table 2. Ranking of socio-economic constraints according to the CFI score**

Sl. no.	Constraints	CFI	Rank order
1.	Non-availability of water supply	191.67	I
2.	Shortage of labour	188.33	II
3.	Stray cattle	188.33	II
4.	Non availability of credit	168.33	III
5.	Shortage of water supply	165.00	IV
6.	High fuel cost	158.33	V
7.	Shortage of credit	158.33	V
8.	Non-availability of labour	151.67	VI
9.	Non-adequate demand in the nearby area	144.17	VII
10.	High wage rates	140.83	VIII
11.	High transportation cost	140.83	VIII

Non-availability of credit for growing more than one crop was also reported as a constraint of double cropping. Shortage of water supply to the crop field, high fuel cost used in irrigation and shortage of credit were some of the other major problems which were faced in adopting double cropping. Besides these, non-availability of labour when needed, non-adequate demand in the nearby area, high wage rates of labour and high transportation cost were also indicated as some constraint by many of sample farmers.

Similar studies have been done and observed the major problems faced by the farmers in the production front were a shortage of labour during peak season [5,6,7]. Gavisiddappa et al. [8] identified the problems in Gherkin production and trade in Haveri district of Karnataka and observed that, lack of irrigation facilities and lack of cheap labours were the major problems. Borah et al. [9] revealed that the major problems faced by the members of the farmers' groups organized under Agricultural Technology Management Agency (ATMA) in Jorhat district of Assam included non-availability of various irrigation facilities, lack of special market for organic produce, lack of need based training, lack of electricity, non-availability of seed in the village at proper time, non-availability of own vehicle, unavailability of raw materials needed for storage construction, high cost of infrastructure, unavailability of organic manures and high cost of pump sets and other equipments required for irrigation. Again according to Sharma [10] high cost of chemicals, non-availability of disease free seeds, non-availability of chemicals, lack of labour, lack of time, lack of technical knowledge, financial problem, poor shelf life, inadequate supply of storage material, lack of marketing facilities, less support price and price fluctuation were the main constraints encountered by the vegetable growers in the adoption of recommended farm practices of major vegetable crops in Punjab.

#### 4. CONCLUSION

The present study revealed that, the farmers of Upper Brahmaputra Valley zone of Assam were not willing to adopt double cropping fully on their land holding because of some major problems such as non availability or shortage of required water supply, non availability or shortage of labour, higher wage rate of labour, stray cattle, non availability of credit, high transportation cost. Therefore, to promote double cropping in Assam, only distribution of seeds and fertilizer, boosting

productivity of crops etc are not sufficient. There is need to enhance awareness among the farmers to overcome their problems in adopting double cropping. The present study suggests some measures to overcome these reported problems such as ensuring adequate irrigation facilities, proper awareness among the farmers regarding water harvesting, acquiring credit facilities offered by different financial institutes specially for farmers, proper fencing around the field to avoid stray cattle, facilitate construction of sufficient godowns and cold storages by Agriculture Department of the state to promote marketing as well as to reduce transportation cost.

#### CONSENT

As per international standard or university standard written patient consent has been collected and preserved by the author(s).

#### ETHICAL APPROVAL

It is not applicable.

#### COMPETING INTERESTS

Authors have declared that no competing interests exist.

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