

# How socially sustainable are the rice farms in mountains? Evidence from Senapati district of Manipur

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## ABSTRACT

Sustainable agriculture is regarded as the successful management of resources for agriculture to satisfy the changing human needs while maintaining or enhancing the quality of environment and conserving natural resources. The present study was conducted to examine the social sustainability of rice farming at farm level. A random sample of 80 rice farmers of Senapati (hill) district of Manipur were surveyed and social sustainability index were constructed following the Human Development Index (HDI). Most of the farmers (26%) were educated up to primary level and operational land holding was small (1.08 ha) in the study area. The farms under moderately sustainable category may be improved by providing training to the farmers pertaining to rice cultivation and affiliating them to Self-help Groups (SHGs), co-operative societies. Joint decisions on domestic decisions are common and the farmers had 12 years of experience in rice farming but none of the sample farmers got training in rice cultivation. About 53.33 per cent of the farms were in sustainable category, followed by moderately sustainable category (46.67%) in the study area. The study recommends that efforts for improving social sustainability and training pertaining rice cultivation should be initiated for the farmers and application of organic nutrients, diversified cropping system and conservative tillage practices should be promoted in the study area to augment social sustainability.

**Keywords:** Social sustainability, rice, Manipur

Sustainable agriculture is the main pillar for sustainable livelihood and food security of the farm. It integrates three main goals i.e. environmental health, economic

profitability and social equity. The social dimension represents a system of living or associating in groups or communities and considers the importance of maintaining and improving human living standards. It does not define wealth in terms of material possessions that can be bought, sold or stocked for the future (Brown *et al.*, 1997). It shifts the emphasis from individual rights and economic wealth to community right and social welfare of all human beings. The social sustainability suggests social equity, health equity, community development, social capital, social support, human

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rights, labour rights, social responsibility, social justice, cultural competence and human adaptation (Sadler, 1990). It focuses on the personal assets like education, skills, experience, consumption, income, employment, distributional and gender equity. Social comprises every citizen's right to actively participate in higher society as an essential element. The choice of criteria or indicators depends on or based on the social situation in the study area. Roy *et al.* (2013) studied three rice-growing ecosystems in Bangladesh and reported that social capital contributed 35% of the overall

sustainability and it assumed society's well being. The contributed indicators of social sustainability were capital formation (human and social), good governance (public participation, accountability of public employees) and equity. Motieelangroudi and Shamsaie (2007) studied the rural development due to agricultural sustainability in Zanjan province and reported that the factor social participation' defined almost 9% of the total variance. Similarly, Barghi *et al.* (2013) found that social participation explained almost 9% of the variance in agricultural sustainability in Central district of Marivan

**Table 1:** Farm level social sustainability indicators

Sl. No.	Indicators	Measurement	Unit	Relationship with social sustainability
1	Family labour income	GFI - Cost B2	Per ha	More - Positive Less - Negative
2	Women empowerment	i) Education level ii) Domestic decision making iii) Control over family financial resources iv) Access to information v) Social participation	Illiterate -0 Read and write-1 Primary – 2 Middle – 3 High school- 4 Intermediate - 5 Graduation and above- 6 Takes decision- 1 Otherwise - 0 Control – 1 Otherwise – 0 Access – 1 Otherwise -0 Yes – 1 No- 0	Scores High - Positive Low - Negative
3	Drudgery of work	i) Sharing of burden/ carrying of load ii) Days off from work	1 person – 0 2 persons - 1 More days, less drudgery	Scores Days High - Positive Low - Negative
4	Human capital	i) Experience in rice farming ii) Training iii) Information about health education	No. of years Yes – 1 Otherwise -0 Yes -1 Otherwise -0	Years Scores High - Positive Low - Negative
5	Social capital	i) Relationship with family and neighbour ii) Affiliations with SHG, societies, organisations	Yes -1 Otherwise -0 Yes -1 Otherwise -0	Scores High - Positive Low - Negative

town of Iran. This indicates that more cooperative and participatory activities among farmers and a farmer's level of motivation to participate in such activities could be beneficial to achieving agricultural sustainability.

The farming system in Manipur is rice-based system. So, if rice farming fails or become unsustainable, the farming community will be adversely affected. Hence, question such as whether the rice farming is socially sustainable at farm level arises. Thus, the study was conducted to access the social sustainability of rice farmers at farm level.

### ***Database and Methodology***

Senapati district of Manipur was selected purposively for the present study as the district topped in area under rice cultivation among the hill districts. In the next stage, Saikul and Saitu Gamphazol blocks were selected randomly from the district. A cluster of three to four villages were selected from each of the selected blocks. Hence, a sample of 80 farmers was drawn randomly from the selected villages. Primary data were collected in 2015-16 to meet the objective. Social sustainability index was constructed following the Human Development Index (HDI) developed by UNDP (1990). Farm level social sustainability indicators were measured in table 1.

### ***Construction of farm level sustainability index***

Step 1: Normalization of indicators

Step 2: Weights were calculated following the method given by Iyenger and Sudarshan (1982).

Step 3: The weights were multiplied with their respective normalized indicator values and then added to get the indices of the dimension of sustainability.

Step 4: Based on the values of sustainability indicators the farms were categorized into four categories such as (1) "Least sustainable" (LS) for farms with values ranging from 0.00 to 0.25, (2) "Moderately sustainable" (MS) for farms with values ranging from 0.26 to 0.50, (3) "Sustainable" (SL) for farms with values ranging from 0.51 to 0.75 and (4) "Highly sustainable" (HS) for farms with values ranging from 0.76 to 1.00.

### ***Results and Discussion***

The average age of the farmer in the study area is 56 years. Most of the farmers (26%) were educated up to primary level (Fig 1) and per household operational land holding was small (1.08 ha) in the study area. Majority of the male family members were engaged in agriculture (84.62%) in the study area, which imply that agriculture was the main occupation for the male population in the study area and 73 per cent of the female members

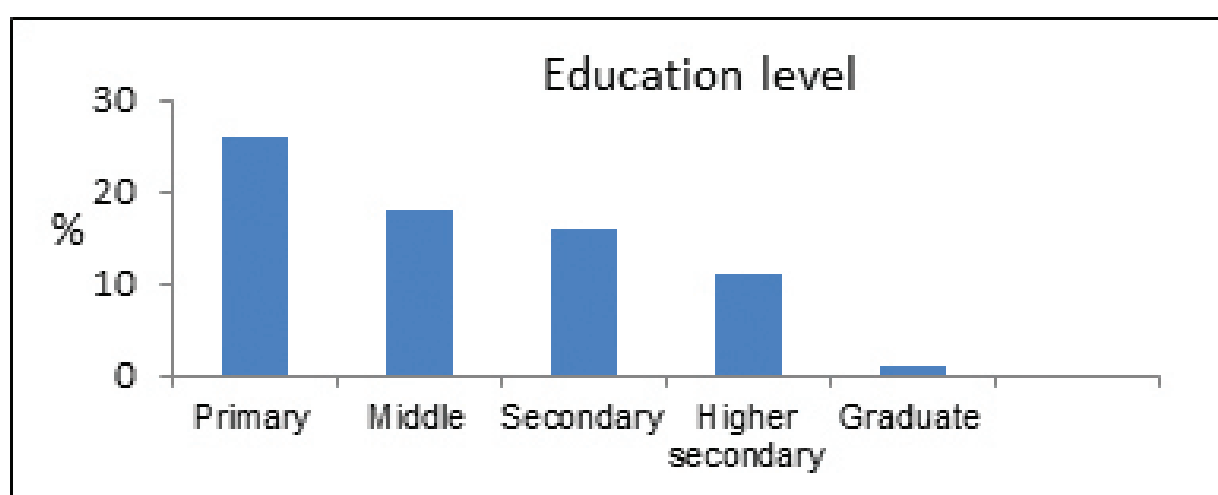


Fig. 1: Education level of sample farmers

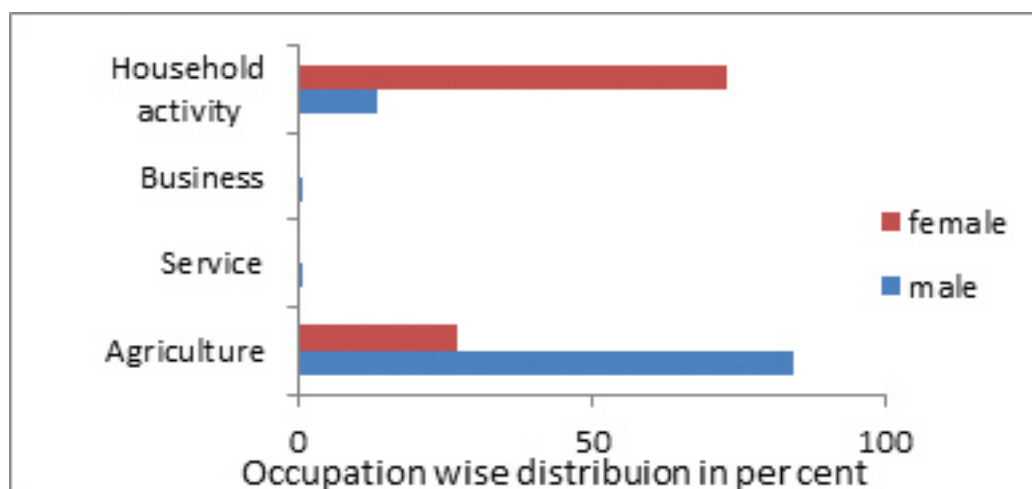


Fig. 2: Occupation wise distribution of sample households

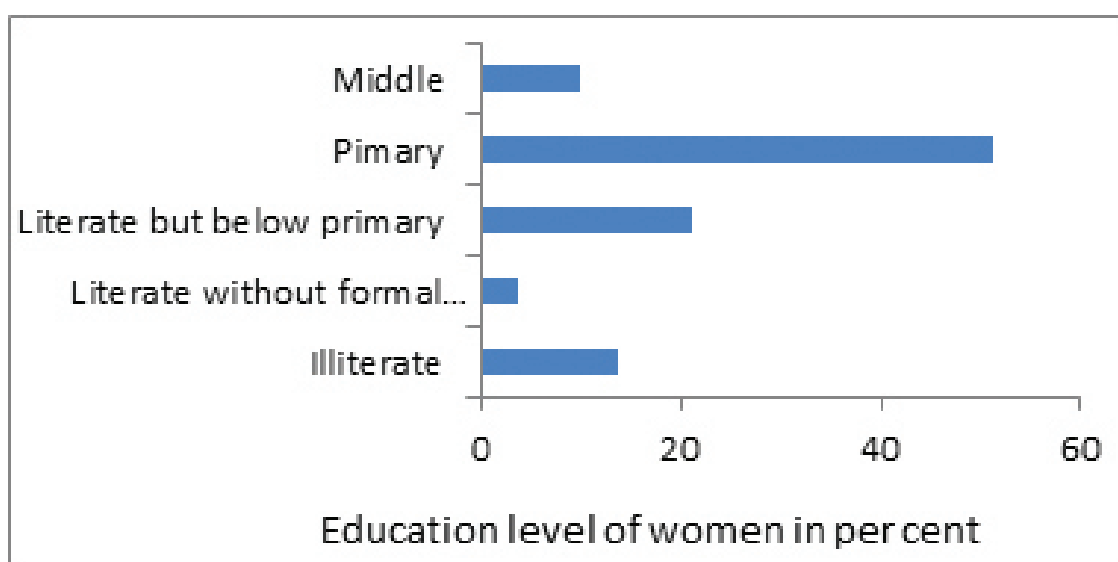


Fig. 3: Education level of women in the sample household

were engaged in household activities in the study area (Fig 2). The estimated family labour income was 18174/ha in the study area (Table 2). Women empowerment is a tool to access the potential of women in the study. Four sub-indicators were studied to evaluate women empowerment.

It was observed that majority of the women in sample household in Senapati had education up to primary level, followed by literate but below primary level (21.25%) (Fig. 3). Cooking of different items was decided

mostly by the wife and decision on health care was primarily taken jointly by husband and wife. Purchasing jewellerys, household items, visiting market and controlling of family finance were jointly decided by husband and wife in the study area (Fig. 4).

Radio, television and mobiles were the gadgets to access information on rice farming in the districts (Fig 5). About 35% of women participated in social activities such as organization to protect human rights, fight anti-social elements in the society, works for improving the

**Table 2:** Descriptive statistics of social sustainability indicators

Sl. No.	Indicators	Particulars	Unit	Senapati (n=80)
1	Family labour income		Per ha	18173.54
2	Drudgery	i) Preparation of seed bed		1.00
		ii) Sowing		1.00
		iii) Land preparation		2.00
		iv) Transplanting		3.00
		v) Weeding		3.00
		vi) Fertilizer application	Dummy (1 person=0, 2 persons=1, 3 persons =2, more than 3 persons=3)	0.00
		vii) FYM application		1.00
		viii) Pesticide application		3.00
		ix) Harvesting		3.00
		x) Threshing		1.00
		xi) Loading		1.00
		xii) Unloading		1.00
3	Human capital	(a) Sharing of burden		
		(b) Days off from work during cultivating season	Days	28.00
		i) Experience in rice farming	Years	12.00
		ii) Farmers who obtained training pertaining rice cultivation	%	0.00
4	Social capital	iii) Farmers who obtained information about health care		0.00
		i) Farmers who availed information about farming from relatives and neighbours		31.25
		ii) Farmers who sought help from their relatives and neighbours during the times of need	%	33.75
		iii) Farmers who were affiliated to SHGs		0.00
		iv) Farmers affiliated to cooperative societies		0.00
		v) Farmers affiliated to farmers' club		0.00

**Table 3:** Frequency distribution (in %) of rice farms across different social sustainability category

Category	% of farm sustainability
LS (0.00 to 0.25)	0.00
MS (0.26 to 0.50)	46.67
SU (0.51 to 0.75)	53.33
HS (0.76 to 1.00)	0.00

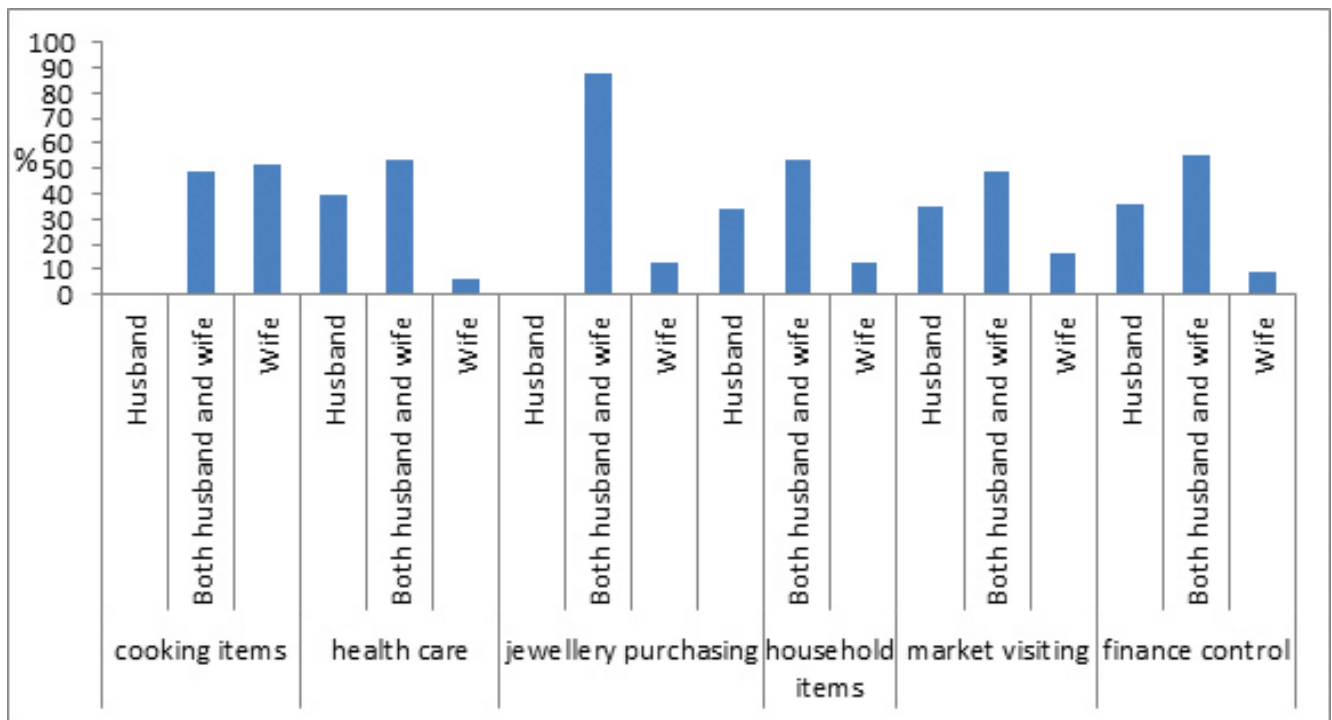


Fig. 4: Domestic decision making in the sample households

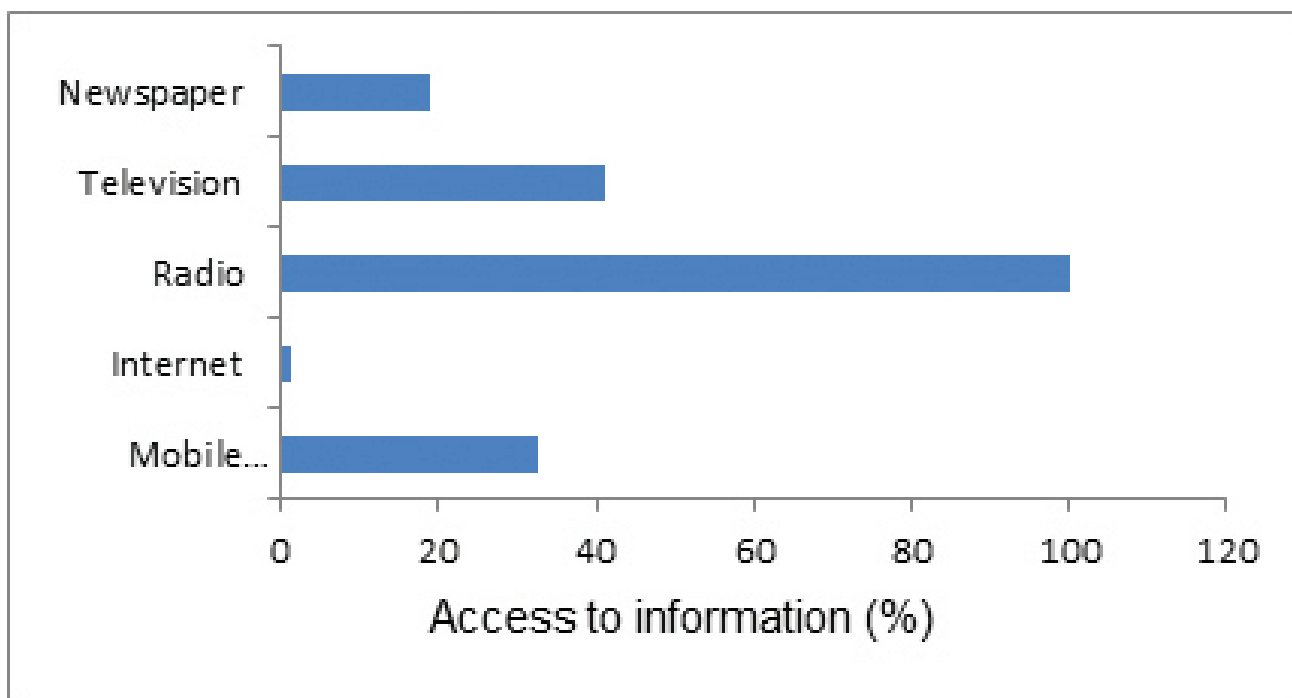


Fig. 5: Access to information by the sample households

education and living standard of women and children. Sharing of burden, carrying of weight and enjoying leisure days indicate equity between the male and female and leads to sustainability.

Transplanting, weeding, harvesting, threshing and application of Farm Yard Manure (FYM) were the activities where the burden was shared by more than three persons. About 28 to 30 days, the farmers got rest from farming activities during the crop season in the study area. The farmers had 12 years of experience in rice farming and none of the sample farmers got training in rice cultivation. Discrimination of information on health care was poor in the study area. About 31.25 per cent of the sample farmers' availed information about rice cultivation from their relatives and neighbours but none of the farmers were member of any SHG or farmers' club in the study area (Table 2).

Majority of the farms (53.33%) were in sustainable category with respect to, social sustainability, followed by moderately sustainable category (46.67%) in the study area (Table 3). The farms under moderately sustainable category may be improved by providing training to the farmers pertaining to rice cultivation and affiliating them to SHGs, co-operative societies and farmers' club to achieve agricultural sustainability. Ommani and Chizari (2006) also pointed out that, more co-operative and participatory activities among farmers and the level of motivation to participate in such activities could be beneficial to achieve agricultural sustainability.

## Conclusion

Majority of women had primary level education and joint decisions on domestic issues were common in the sample household of Senapati district. The use of radio, mobile phones and television were high to access information on rice farming but none of the sample farmers got training in rice cultivation neither they were member of any SHG. Majority of the rice farms were either moderately sustainable or sustainable in the study area. Thus, training pertaining rice cultivation should be initiated for the farmers in the study area.

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