

# Small Farmers and Agricultural Transformation: A Sociological Study in three Villages of India

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## ABSTRACT

Agriculture is the fundamental source of subsistence of small farmers who contribute 51 per cent of agricultural production and 70 per cent of high-value crops. However, they constitute the bulk of India's hungry and poor.

Agriculture transformation or Commercialisation of subsistence agriculture will enable small farmers to enhance gender equity in agriculture, and to earn a better income.

This research aims at finding out the family labour division based on gender both at the subsistence and commercial level; exploring the socio-economic differences between subsistence and commercial farmers that may also explain the vulnerabilities and resiliencies of agricultural transformation.

The study conducted 250 interview schedules at the level of households involved in small farms of rice cultivation who were chosen by purposive sampling within three villages of Dibrugarh district during December 2021-March 2022. The descriptive statistics were used for data analysis.

The finding of study revealed that the commercial agriculture empower women economically and socially in their families and the community, it encouraged small farmers to live in joint families, and participated in cooperative and social organisations, it obviously generated better income compared with the subsistence agriculture that may give a good indication of the contributions of agricultural transformation to the poverty-reducing level in small farmers' households.

The study concluded some recommendations: Optimal use of agricultural land by establishing irrigation and drain systems, and approaching contract farming can enhance competition of small farmers' production in the market.

**Keywords:** Commercial Agriculture, Dibrugarh District, North-East India, Small-Holder Households, Rice Crop.

## INTRODUCTION

Agriculture is the fundamental source of subsistence of small farmers who account for 86.2 per cent of all farmers in India. These farmers, who hold less than two

hectares of farmland, contribute 51 per cent of agricultural production and 70 per cent of high-value crops, such as grains, vegetables and milk, according to provisional numbers from the 10<sup>th</sup> agriculture census of India in 2015-16.

However, small-holder families together with the families of landless agricultural workers constitute the bulk of India's hungry and poor, as stated by Food and Agriculture Organisation (FAO) of the United Nations in its report 2002.

In the state of Assam of India, the majority of farmers are marginal and small holders of the cultivated land whereas; 92.84 per cent of those farmers merely belong to the category of less than or equal to two hectares (15 bighas) of land per family (Economic Survey of Assam, 2015). Further, this percentage has increased to 98.9 per cent of all farmers in Dibrugarh district of Assam (Human Development Report, 2014).

Agriculture is commonly known as rice culture, whereas Assam is dominated by rice crop; it accounts for quite 74.25 per cent of the cropped area. Rice is the mainstay of improving food security in the state of Assam; it is consumed by about 90 per cent of the state population and (Pegu and Hazarika, 2016).

Small farmers take a big risk of this specialised farming, which depends on a rainfed traditional system, due to uncertain weather conditions, susceptibility to pests and diseases, and the fluctuation in the prices. Small farmers therefore are a very vulnerable group to perpetuate in a poverty trap.

Agricultural transformation or commercialisation of subsistence agriculture is vital for poverty-reducing of these small farmers, whereby small farmers can ensure high market value of their demanded crops by rising agricultural productivity (Tabe Ojong et al., 2022 and Christiaensen, 2018).

We suppose that the rice productivity in this context includes agricultural land and labour that are more effective at increasing incomes for the small farmers and the poor households who are involved in family farming. They may gain the higher income directly as

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producers. Therefore, this approach can attract young people to farming or persuade them not to leave rural areas to towns by offering better ways to earn money. Furthermore, practising farming based households will strengthen the social ties among households as well as the entire community, and it may enhance gender equity.

We aim at finding out family labour division based on gender along with the rice value chain in case of commercial and subsistence agriculture, exploring the socio-economic differences between small farmers based on the type of agriculture (Commercial/Subsistence) that may also explain the vulnerabilities and resiliencies of agricultural transformation.

**The Theoretical Background:** In the structural-functional perspective, the small farmer household or family farm is seen as a socio-economic unit that is 'patterned and predictable ways of thinking and behaving (beliefs, values, attitudes and norms) that are organised around vital aspects of group life and serve essential social functions; that is, they meet the needs of their members and enable the society to survive' (Goode, 1963). The family farm structure is more often a joint and an extended one, involving groups of parents, children, grandparents and other relatives. Principally, it is accountable for three substantial functions, which are to raise children responsibly, to give emotional security and to provide economic support; as they perform economically. According to *Frank Ellis*, 'Farmer households access to their means of livelihood in land, utilise mainly family labour in farm production, but fundamentally characterise by partial engagement in markets which tend to function with a high degree of imperfection (Brookfield and Parsons, 2007).

Small farming therefore is a small farm operated by a family, and makes no or limited use of non-family hired labour; in terms of family ties, this form of agriculture, which is mainly reliant on the human resource base of the family, is reinforced by values of solidarity. Their production relies on the contributions of family members in order to produce the bulk of the household's consumption of staple foods and family's food security (Garner and de la O Campos, 2014). They receive in return, shelter, support in times of illness and old age, and help with costs of marriage.

On the other side, the structure-functional perspective argued the functionality of specialised gender roles: the instrumental husband-father, who supports the family economically and wields authority inside and outside the family, and the expressive wife-mother- homemaker, whose main function is to enhance emotional relations at home and socialise young children within the family, the younger generation is

intensely exposed to the family business, this increases their interest in farming and that provides them by the necessary skills to farm, and these agricultural skills transfer seem to be gendered, whereas, fathers are responsible for the education of sons, and mothers for the daughters (Johnson, 1971; Parsons and Bales, 1955).

Furthermore, the sociologist *Karl Marx's* perspective on the relationship between capitalism and small farmers theorised that 'the small peasant was likewise the victim of an inescapable capitalist exploitation and the forces of competition'. *Marx* thoroughly emphasised that 'agriculture could not flourish under existing civilised conditions in which the peasant was sinking into an increased poverty'. In this regard *Marx* referred to the rising price of agricultural land accompanying the productivity of land declined, whereas it is not possible to use modern machinery and technology to improve the yield of such poor small farmers; that may lead to the mortgage farm's debt growing. For an attempt to break this deadlock, *Marx* claimed 'only an anti-capitalist, proletarian government could end the peasant' economic misery and his social degradation' (Hammen, 1972).

**Previous Studies:** Finding of some studies e.g.; Sanchez et al., 2022; Ojong et al., 2022; Etuk & Ayuk, 2021; Ma et al., 2021; Christiaensen & Martin, 2018; Rapsomanikis, 2015; Collier & Dercon, 2014; Christiaensen et al., 2011; Dercon, 2009; Datt and Ravallion, 1998 and Von Braun, 1995 revealed that agricultural commercialisation can be a source of poverty reducing, whereas it aims at adopting agriculture not only to produce food for family's consumption, but also for generating better income by professional applying of technologies and machinery that leads to rising agricultural productivity. The Productivity includes agricultural land and labour which both together are more effective at increasing the incomes of small farmers and poor households who are involved in family farming. Therefore, small farmers can ensure high market value of their demanded crops. Further study of (Carletto et al., 2017) highlighted a positive relationship between commercialisation and nutritional status. Whereas positive marketable surplus allowed farmers to secure food and protect food security under conditions of price uncertainty or volatility.

In the history of India, determinants of commercialising subsistence agriculture basically were yield-enhancing technological innovations and their adoption by smallholders (Von Braun and Kennedy, 1994), as well as population growth, demographic change, and food security, technologies, infrastructure, government policy aspects, price factor, and information technology (Satyasai and Viswanathan, 1997), institutions, risks, markets and their integration,

transaction costs, food habits, asset holdings (Jaleta et al., 2009).

Otherwise many studies conducted so far on the multiple factors that influenced the extent of agricultural commercialisation of smallholder and growth including increased investment in agriculture, export opportunities, greater use of market purchased inputs and services, high market prices, and adoption of new agricultural technologies. Other significant factors that could impact the marketed surplus were awareness of minimum support price (MSP), access to regulated markets and credit (Chakraborty, 2021). Further 'Smallholders producing a diversity of crops were more likely to sell in markets. This was consistent with the smallholder livelihood approach of diversifying a small portion of land into cash crops. However, financially destitute households receiving social safety net benefits were less likely to participate in markets and were more apt to practise subsistence farming' (Weatherspoon et al., 2021). Moreover, it was reported that the higher farm size and access to market encouraged the farmers to go for higher levels of commercialisation (Sharma et al., 2016), as well as, production training and capacity building, access to irrigation on the farms, access to agricultural inputs, services, and markets, Use of improved agricultural technologies and practices (Gc and Hall, 2020). Another study suggested that cooperative membership and land tenure security raised the level of marketed outputs of farmers (Lawin and Zongo, 2016). Regarding the rice crop, a Nigerian study assessed the determinants of intensity of adoption of Improved Rice Varieties (IRVs) and the effect of market participation on farmers' welfare in Nigeria. The variables that positively and significantly influenced the intensity of IRVs adoption include income from rice production, membership of a farmers' organisation, and the distance to the nearest sources of seed, cost of seed, yield and level of training. Gender of household head, access to improved seed, years of formal education, and average rice yield were those variables that are positive and statistically significant in increasing the probability that a farmer would participate in the market (Awotide et al., 2016). In reference to the role of agricultural extension services in agricultural commercialisation, These services were supposed to fulfil many aims, from reducing rural poverty and improved livelihoods for rural households to increasing the overall production and contributing to foreign exchange earnings from exports (Maurya and Malik, 2018). Other findings demonstrated that the specific limiting factors emerging farmers face are poor physical infrastructure such as poor roads, lack of transportation to the markets from the farms, lack of marketing skills and information, poor market infrastructure, and high transaction costs, insufficient land availability to expand production, lack

of agricultural implements to better production, poor production and farm management skills, as well as low education levels which results in an inability to interpret market information to be used in production planning and marketing (Khapayi and Celliers, 2016).

**Small Farmers:** They are the farmers who own less than or equal to 2.0 hectares (15 bighas) of farmland (Agricultural Census of India, 2015).

**Agricultural Transformation:** "Agricultural transformation can broadly be defined as the process by which an agri-food system transforms over time from being subsistence-oriented and farm-centred into one that is more commercialised, productive and off-farm centred (Balino et al., 2019). It is also known as commercialisation of subsistence agriculture and refers to adopting agriculture not only to produce food for family's consumption, but also for generating better income by the professional application of technologies and machinery (Von Braun, 1994).

**The Role of Agricultural Transformation in Enhancing Small Farmers' Incomes:** According to The World Bank (2008), commercialisation amongst smallholder farmers can be increased through participation in output markets as this incentive will increase their investments into farm productivity and thus enhancing agricultural profitability and increasing household incomes together.

Agricultural transformation as an approach focuses on the farming household, providing opportunities for small farmers to earn a better income (Beyene, 2018 and Von Bruan et al., 1994). To employ this approach, there are principally three methods raising farm productivity for getting increased marketed surplus, diversifying of production to include higher-value crops and livestock and taking advantage of employment options off the farm (de Janvry & Sadoulet, 2020; Fan et al., 2013; Jeon, 2013; Reardon and Timmer, 2012; Lwin et al., 2011).

In India, agricultural transformations mainly appear in three trends, which are: (1) *The farm sector is becoming more commercial and diversified* of higher value crops such as dairy, poultry farming, and cash crop (rice, tea). Large numbers of small farmers are known to benefit from this trend (Birthal and Negi, 2012); 2) *The share of agricultural employment is coming down* from 60 percent of the total workforce in 2000 to 49.7 percent in 2013, according to World Development Indicators; and 3) *Rural poverty is declining* from 42 percent of the rural population in 2004 to 26 percent in 2011 (Ferroni and Zhou, 2017).

**Gender Divisions in Agricultural Activities:** Rural women and men have always been working jointly on the farm, yet women's contributions have tended to lack recognition and documentation. However women's

issues are yet to be adequately addressed in development planning and programmes (World Bank, 2008). Fighting against rural poverty brings about women’s participation in the agricultural economy (Boserup et al., 2013). whereas both women and men engage in activities of production of cash crops such as rice reflects the importance of survival strategies, to secure better livelihoods and self-reliance in every household. A traditional rural setting has its form of traditional gender divisions in agricultural labour. Culture sees farming as a predominantly male domain and women are traditionally seen as helpers (unpaid labour). Rural Women have different roles in development that are summarised as “housework, childcare and subsistence food production”. These roles have increased with women’s involvement in commercial production (Mosse, 1993 and Momsen, 2010).

**MATERIAL AND METHODS**

We utilised various tools for information assimilation. *Primary Data:* They were collected through interview schedules, researchers’ observation and key information interviews with “the village headman”. *Secondary Data:* They were gathered through the development reports and governmental surveys and censuses as well as scientific journals. The unit of analysis is the data for the small farmers who operate less than or equal to 15 bighas of cultivated land of rice crop at the household level; 250 such individual interviews were conducted. Descriptive statistics were used for data analysis that confined to frequencies and percentages. Data was gathered through purposive sampling from three villages during September to

December 2021. *Description of the Studies Villages:* The three villages were chosen within Dibrugarh district of state of Assam; including *Kamar Gaon, Hat Kata Konwar* and *Dighala Gaon* where a total of 747, 230 and 101 households respectively live. They mainly work in cultivating rice, tea crops; and poultry farms in addition to governmental occupations (The Census of India, 2011).

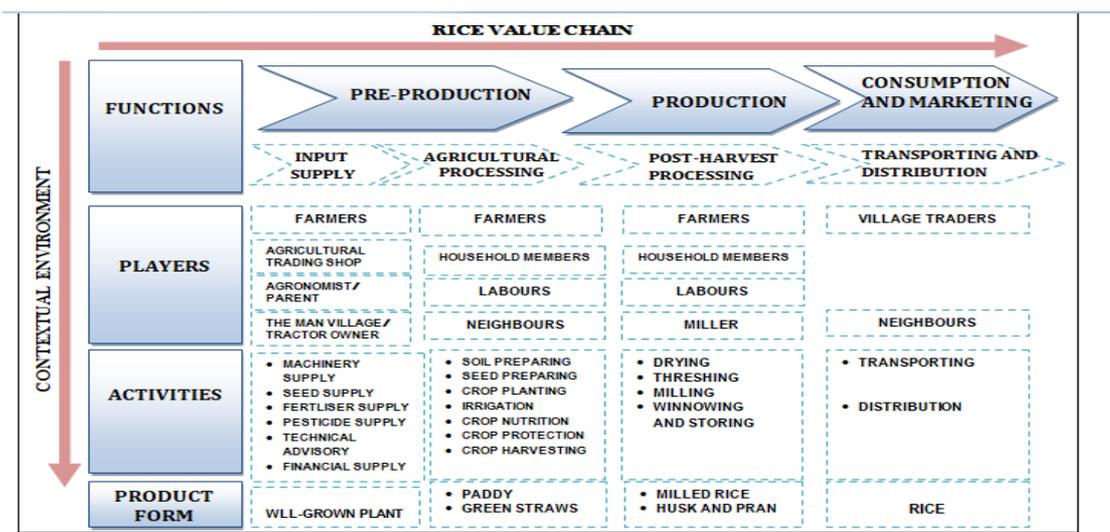
**FINDING AND DISCUSSION**

**1. Family Labour Division Based on Gender A Long with the Rice Value Chain in Study Area:**

The rice value chain is characterised by a smallholder-based production system in which farming households cultivate the rice crop on less than or equal to 15 bighas of farmland. The value chain ranges from pre-production to own production in interaction with small local millers to local traders who are only their channel into the local market.

As shown in chart 1, the rice value chain is typically structured based on the levels of pre-production processing, production processing as well as consumption and marketing.

The small farmers with other players performed various activities along the value chain of rice that are: soil preparation, seed preparation, crop planting, crop nutrition, crop protection, crop harvest, crop threshing, crop drying, crop winnowing then millers converting paddy into white, edible rice with maintaining quality and grading. Farmers do bagging, storing the production they use for their family food consumption or for selling to the village traders who transport it to the local market.



**Chart 1. Rice Value Chain in the Study Area**

Source: Field Study

### 1.1. Gender Divisions in Rice Cultivation Activities Based on Subsistence Agriculture:

**Chart 1.1** shows the activities of the rice cultivation process and the distribution of the performance of these activities based on gender (the participation of men and women in rice cultivation process from pre-production and production to marketing) in the study area: men group includes husband, father, son (s), brother (s) son (s) in law, grandson (s) and male labourers, while women group comprises mother, wife, daughter (s), sister (s), daughter (s) in law, granddaughter (s) and female labourers.

- A. Decision Making:** It is usually the men among the households that make the decision regarding the crop because of long standing tradition, which validates their authority over decision-making concerning the crop. This reflects their core obligations towards family regarding food and financial matters. Thus the male contribution towards agricultural decision making is almost double to that of female, that is, 65 per cent against 35 per cent.
- B. Seed Preparation:** The participation of men 56 per cent and women 44 per cent in seed preparation is nearly equal other than a 6 per cent increase in men's contributions.
- C. Land Preparation:** Basically this activity is performed by men, as it requires their physical power. Thus we found that 98 per cent of men performed this work; with 2 per cent only of women's involvement. These women actually represent the female-headed household who take the whole responsibility of the family as well as rice production due to absence of the husbands and adult sons.
- D. Plant Establishing:** Majority, that is, 85 per cent of men sow rice seeds in the soil (including one farmer who transports rice seedlings in the soil after transplanting them in the nursery), while 15 per cent of women participate in plant establishment.
- E. Plant Nutrition:** It is mostly performed by men who account for 97 per cent but only 3 per cent of women involved in the same activity. It is usually men who are skilled in managing rice nutrition. They have acquired the method of applying organic (animal) manure (sometimes combined with chemical fertilisers) by their parents since childhood in order to increase rice productivity. They inherently apply organic manure to improve soil fertility. Meanwhile, intensive rainfall and severe floods may cause significant soil erosion because heavy rains can wash away soil nutrients. Manure organic matter as a source of crop nutrients and soil amendment contributes to improved soil structure and increased nutrients retention. Farmers who operate uplands or plant high-yield seeds often apply chemical fertilisers such as NPK fertilisers, which consist of (N) nitrogen, (P) phosphorus, and (K) potassium. Nitrogen is very important for the increase of plant height, leaf size, and panicle number; and for a high yield per hectare, phosphorus contributes to the development of strong roots and plant growth, and potassium contributes to resistance of plant diseases and to achieving good rice yields.
- F. Plant Protection:** It is mainly achieved by 92 per cent of men with a share of 8 per cent of women who actually participate in weeding control; while spraying pesticides is performed totally by men.
- G. Harvest:** Rice harvest typically requires intensive labour, therefore we have found a clear participation of women, which accounts for 44 per cent, and only 56 per cent of men do harvest.
- H. Selection of the Best Seeds:** Usually farmers have to select the best seeds for their next cropping to maintain a good rice yield next season. This activity takes place in two steps; in the field during the harvest process and at home after the winnowing process. Traditionally, women carry out winnowing of the rice crop and most activities of rice production that take place at the house while they take care of their children. We have therefore observed a clear share of women, which accounts 46 per cent, against 54 per cent of men's participation.
- I. Threshing:** It takes place manually or by using a thresher machine. Women are the main partner in performing the crop threshing manually; it is estimated at 28 per cent, while 72 per cent of men take this responsibility mechanically.
- J. Drying:** Exposure of the seeds to the sun for drying is applied at farmers' homes, which makes the women's participation easier besides her caring of the children. Therefore, 58 per cent of women manage this activity with a share of 42 per cent of men.
- K. Winnowing:** Traditionally, this activity is performed by women and takes place at home, therefore we have found 86 per cent of women do winnowing with help of only 13 per cent of men.
- L. Milling:** It is totally performed mechanically by using households' milling machines at farmers' homes or by renting commercial milling machines in the village. It is mostly performed by men who account

for 91 per cent, in addition to 9 per cent of women’s participation.

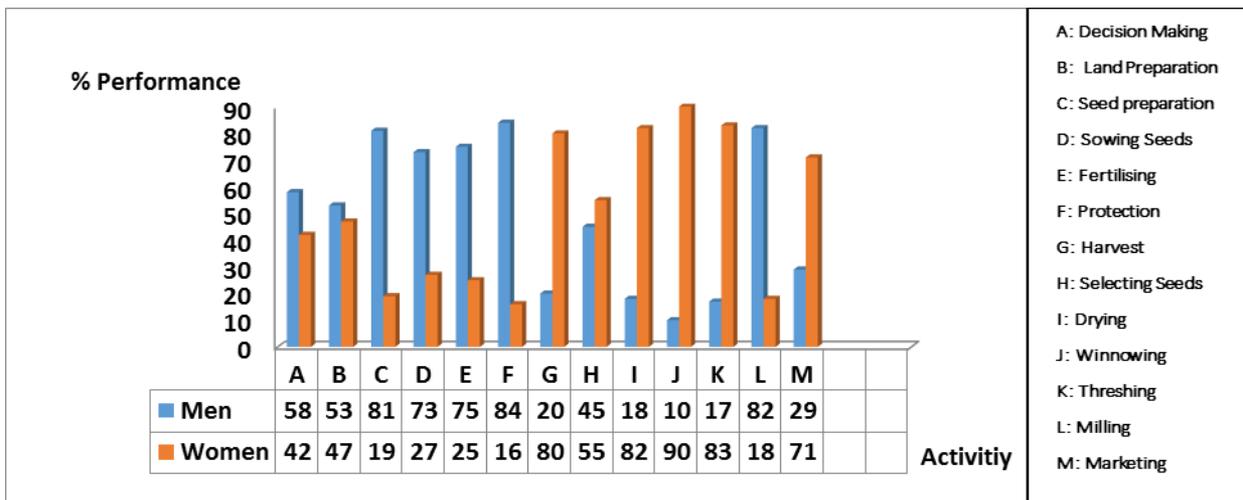
**M. Marketing:** Traditionally, men are responsible for trading with local traders; therefore we have found 83 per cent of men take this responsibility with a limited share of 17 per cent of women taking this responsibility due to their husbands’ absence.

**1.2. Gender Divisions in Rice Cultivation Activities (Commercial Agriculture):**

Women have always been active participants in the agricultural system; both at the subsistence level and at the commercial level. However we have perceived that the absence of their husbands increases their

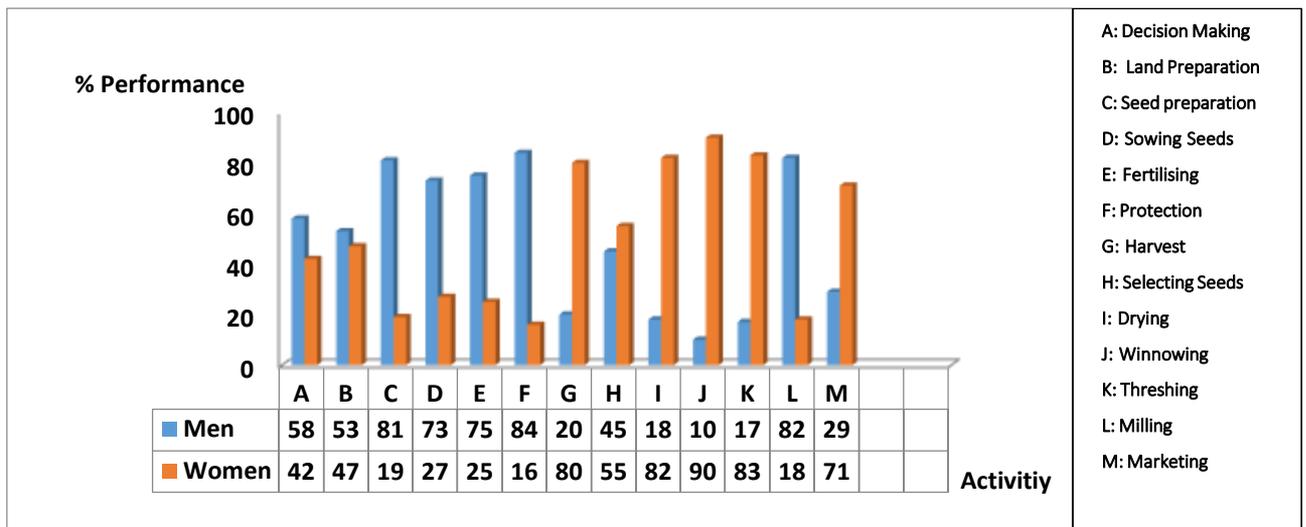
involvement in commercial agriculture, besides their triple roles. Commercial work gives them a prestigious position in the family and the community, because it enables them to make income gains, which reduces the poverty level of their household. In the other words, commercial agriculture empowers women economically to gain higher financial status and thus empowering them socially with more power in making-decisions in the family and making relationships with the local traders and the community.

**Chart 1.2.** explains the interchanged men and women’s roles in the activities and performances of rice cultivation in the pattern of commercial agriculture.



**Chart 1.1. Performances of Rice Cultivation Activities Based on Gender (Subsistence Agriculture)**

Source: Field Study



**Chart 1.2 Performances of Rice Cultivation Activities Based Gender (Commercial Agriculture)**

Source: Field Study

Women’s participation goes to most in: G) harvesting 80%, J) drying 90%, K) winnowing 83%, I) threshing 82%, and M) marketing 71%. While men’s participation is particularly increasing in: C) land preparing 81% and D) plant establishing 73%, E) Plant nutrition 75%, F) plant protection 84%, and L) milling 82%. The gender gap minimises in the activities of A) making decision of the crop: men’s participation counts for 58 per cent, in return, 42 per cent of women’s participation, B) seed preparing 53%, in return, 47 per cent of women’s participation and H) selecting best seeds: women’s participation is estimated at 55 per cent, while men’s participation counts for 45 per cent.

**2. Exploring the socio-economic differences between small farmers based on the type of agriculture (Commercial/ Subsistence)**

Small farmers cultivate rice mainly for their household consumption (known as “*Subsistence Agriculture*”), with the exception of a few who are able to achieve a small marketable surplus at the national level (known as “*Commercial Agriculture*”) (The National Council of Education and Training, 2021). However, the Food and Agriculture Organisation (FAO) of the United Nations recommends in its report of 2013 that “family farm income from farming should go beyond subsistence”; increasing productivity and profitability of the whole rice value chain is a very vital priority in any plan in order to improve rural livelihoods, ensure an adequate supply of rice at affordable prices, and earn foreign currency through rice exports (FAO, 2013).

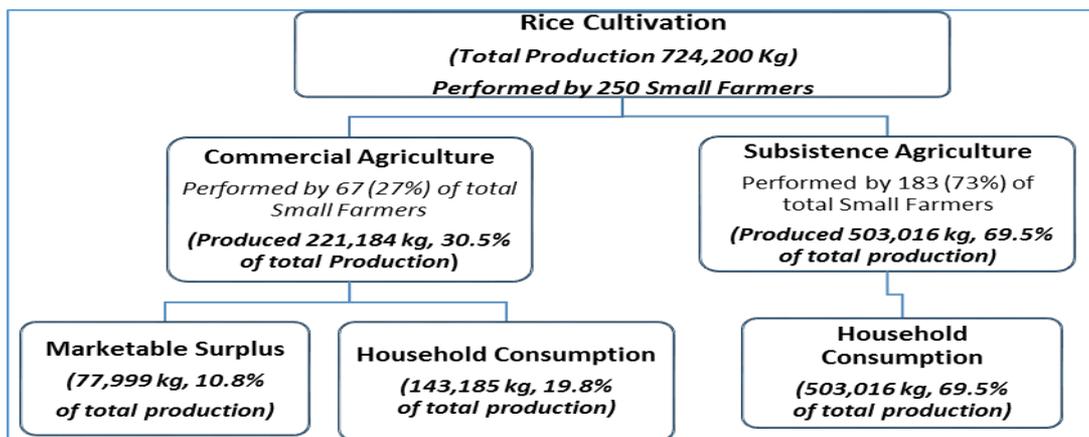
**Chart 2.** shows the distribution of rice production into consumption and marketing. Further, it explains that

250 farmers perform rice cultivation. They constitute the bulk of small farmers in the villages of study. The majority, that is, 183 (73%), of small farmers in the study area only produce rice for their own households’ consumption (subsistence agriculture), while about one-fourth 67 (27%) of them produce sufficient production for both their households’ consumption and marketing (commercial agriculture).

**Chart 2,** illustrates that the total quantity of rice production accounted for 724,200 kg; comprises; 77,999 kg (10.8%) marketable surplus, and 646,201 kg (89.2%) households’ consumption. We have observed that the villages’ traders deliver the milled rice directly to wholesalers from rice storage at the farmers’ homes bearing the transport cost. The farmers bring the crop directly to the processors to remove the husk and bran for home use and sale to villages’ traders while bearing the cost.

At the open market level, we have found that the farmers get paid 3,105,800 rupees by villages’ traders for the marketed surplus at an average price of 45 rupees per kg, while the consumer price of rice in the open market (local retailers) accounts for an average of 60 rupees per kg (loose rice). This means that local traders pay the farmers 75.0 per cent of the price to the farmers.

While at the institutional level, the government of India set the minimum support price for common paddy during marketing season 2020 to be 1868 rupees per quintal (100 kg) or 18.68 rupees/kg in order to ensure remunerative prices for growers’ produce. At this price, the return to farmers over their cost of production is estimated to be at least 50 per cent.



**Chart 2. Distribution of Rice Production**

Source: Field Study

According to the finding, farmers profit by about 125 per cent over the cost of selling their produce on the open market. In other words, the farmers get two and a half times higher return on selling their product in the open market than the government’s minimum support price.

Following charts compare the main socio-economic characteristics of small farmers who are engaged in commercial agriculture to those of other small farmers who rely only on subsistence agriculture in case of rice production in the study area.

**2.1. Type of Family:**

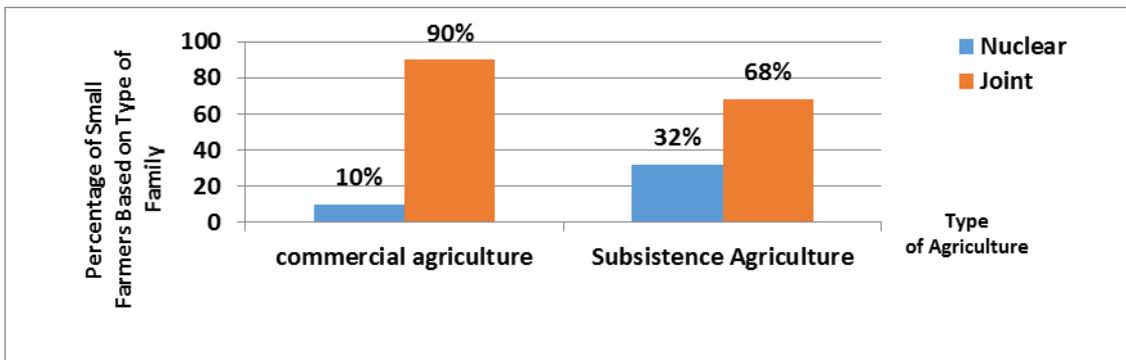
**Chart 2.1.** explains that the majority, that is, 90 per cent and 68 per cent of commercial farmers and subsistence farmers respectively live in joint families. This indicates that commercial agriculture encourages small farmers to

live in joint families to fulfil the demanded requirements of manpower for the agriculture which provides higher incomes for the members of families as producers

**2.2. Size of Household:**

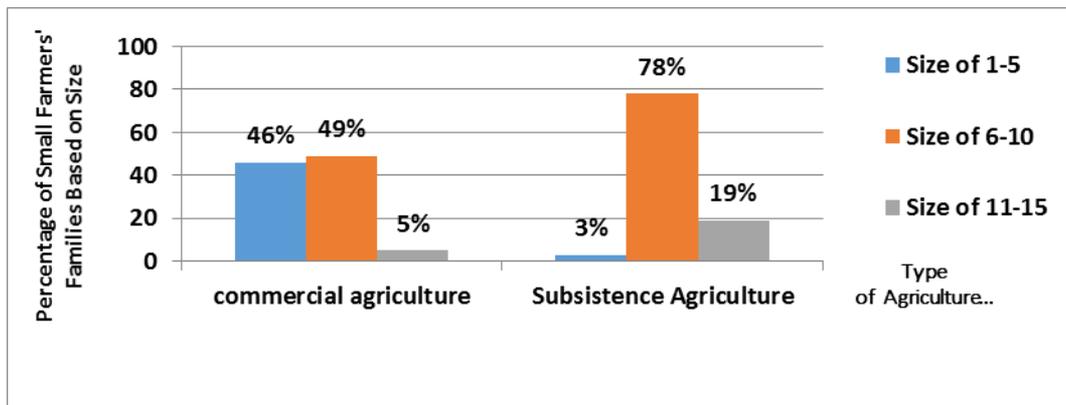
**Chart 2.2.** explains that the highest values 78 per cent and 49 per cent of subsistence farmers and commercial farmers respectively belong to the middle category of 6-10 of household size.

**Chart 2.2.** further shows the decreasing of the number of large sized households, which counts for only 19 per cent and 5 per cent in terms of subsistence and commercial agriculture respectively, and that may cause lack of agricultural labour and the efficiency of utilisation of the agriculture land unit.



**Chart 2.1. Types of Families of Small Farmers Based on the Type of Agriculture**

Source: Field Study



**Chart 2.2. Sizes of Household of Small Farmers Based on the Type of Agriculture**

Source: Field Study

This uniform decline in large sized households may be attributed to a higher nucleation of families; as mentioned above regarding the subsistence farmers in chart 2.1. On the other hand, the fertility rate is declining in India. The latest set of findings of The National Family Health Survey in 2019 revealed that the national Total Fertility Rate (TFR) was found to be 2.2 (this means on average a woman is giving birth to 2 children), but it has declined to 2.1 in rural areas and 1.6 in urban areas. Meanwhile, the State of Assam was found to have a total fertility rate of 1.9. According to the National Family and Health Survey Data 2019-21, the reasons for significant decline in the total fertility rate are: 1) The Contraceptive Prevalence Rate (CPR) has substantially increased to 67 per cent. According to the indicators' report of the sustainable development goals, the level of contraceptive use has a strong, direct effect on the total fertility rate and it is an indicator of population and health, particularly women's access to reproductive health services. Contraceptive prevalence is influenced by people's fertility desires, availability of high-quality products and services; social norms and values; levels of education and traditional birth-spacing practices; 2) Female sterilisation has increased to 38 per cent, whereas women are finding themselves taking up the burden of family planning more than men; and 3) Girl child marriage, that is women being married off before they attain 18 years of age, has decreased to 23 per cent.

### 2.3. Numbers of Children:

**Chart 2.3.** explains that the majority values, that are 84 per cent and 73 per cent of subsistence farmers and commercial farmers respectively, have one to two children.

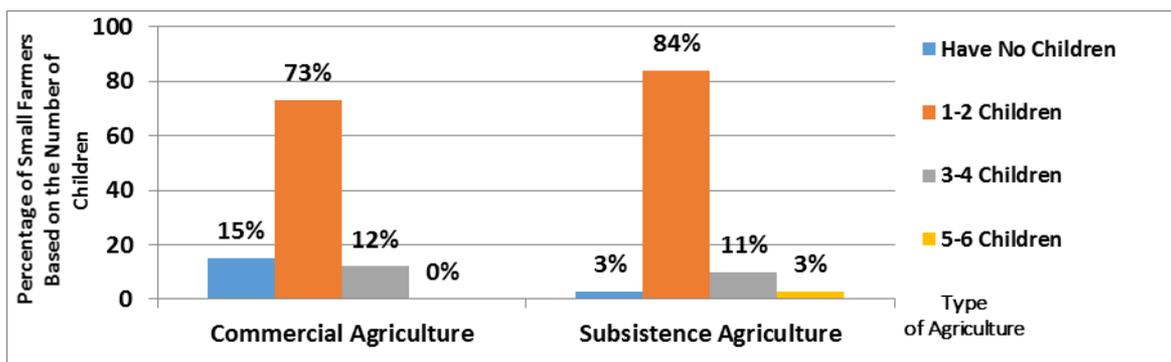
Notably, the government of Assam introduced the Population and Women Empowerment Policy that mandated government officials to strictly adhere to the two-child norm (legislation that bars people from availing government subsidies and other government benefits if they have more than two children) in 2017. However, the data from the National Family Health Survey 2019 already reveals that 77 per cent of currently married women and 63 per cent of men aged 15-49 are already sterilised. This shows that even without a coercive population policy, men and women want smaller families.

According The Population Foundation of India Report in 2021, socio-economic status, poverty, lack of education and employment opportunities among women were main determinants for fertility differentials, however religion was not a significant factor.

### 2.4. Sex of Head of households:

**Chart 2.4.** explains that the majority values 84 per cent and 63 per cent of small farmers engaged in subsistence agriculture and commercial agriculture respectively are male-headed households.

**Chart 2.4** further shows that the female-headed households accounted for 37 per cent and 16 per cent regarding the commercial and subsistence agriculture respectively. The absence of their husbands increases their involvement in commercial agriculture. Besides their triple roles in terms of housework, childcare, and subsistence food production; commercial work gives them prestigious position in the family and the community, because it may enable them to make



**Chart 2.3. Numbers of Children of Small Farmers Based on the Type of Agriculture**

Source: Field Study

income gains, which reduces the poverty level of their household; and thus the higher financial status, the more power in the family and the community.

**2.5. Ages of Head of households:**

**Chart 2.5.** explains that the highest values 45 per cent and 39 per cent of commercial farmers and subsistence farmers respectively belong to the category of age of above 60 years old. The second highest values, 36 per cent of commercial farmers, that is, belongs to the category of age group 41-50 years old, while the same 30 per cent of subsistence farmers belong to the category of age group 51-60 years old.

**2.6. Educational Level of Head of households:**

**Chart 2.6.** explains the majority, that are values 72 per cent and 48 per cent of commercial farmers and subsistence farmers respectively belong to the category of educational level class 6-11.

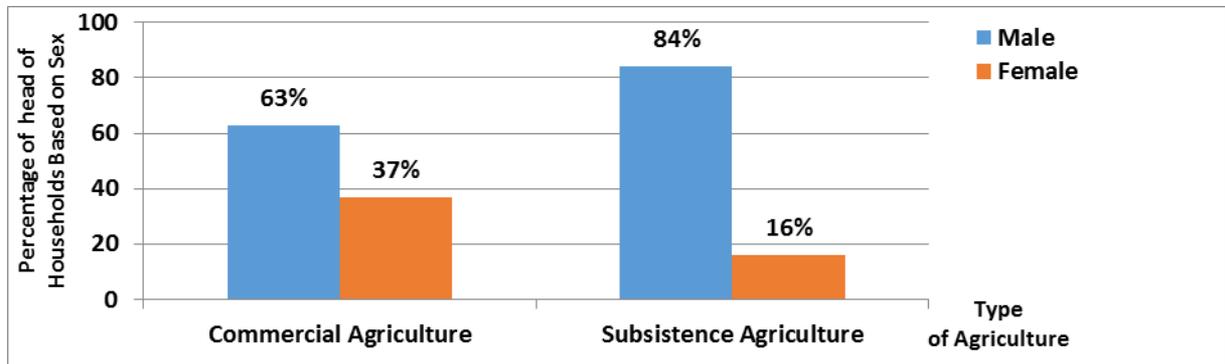
Illiterate farmers counted for 6 per cent and 5 per cent in terms of commercial and subsistence agriculture respectively. However, farmers holding graduation-degree were only 17 per cent and farmers holding post-graduate degree were 13 per cent and they are involved

in subsistence and commercial agriculture respectively. Further, 6 per cent of commercial farmers only obtained class 12 (higher secondary education), while the same is 12 per cent of the subsistence farmers.

**2.7. Occupational Breakups of Head of households:**

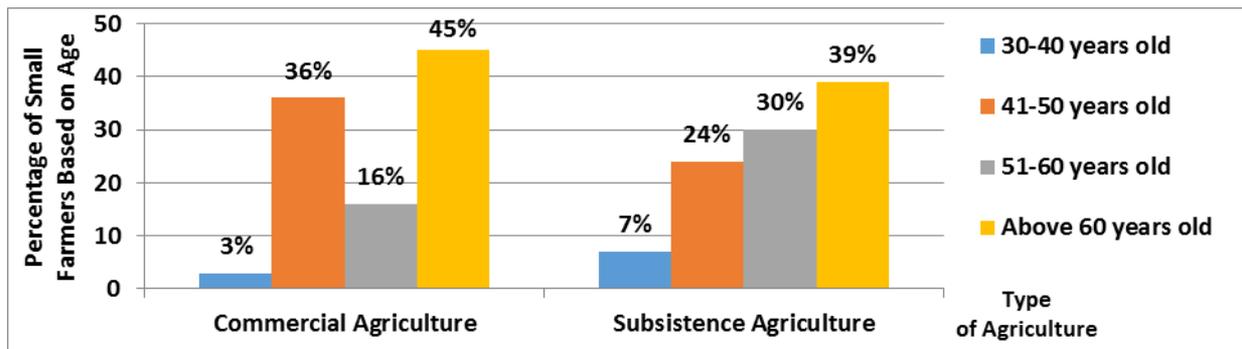
Income diversification is a key to rural development, poverty reduction, and food security (Pingali et al., 2019), whereas farmers involved in non-farm livelihood activities are more efficient in fulfilling their families' basic needs, are more able to endure shocks and have more sustainable livelihood than those who rely on farming only for their living (Asfaw et al., 2017). Especially the fragmentation of farm land limits farm families to secure income from farming alone, and the other challenge is to revitalise the rainfed agriculture of these small farm holdings.

**Chart 2.7.** explains that the majority values 58 per cent and 56 per cent of commercial farmers and subsistence farmers respectively have non-farm occupations (non-farm labour refers to the farmers who perform economic activities, which generate non agricultural income such as governmental services or private business besides their agricultural work)



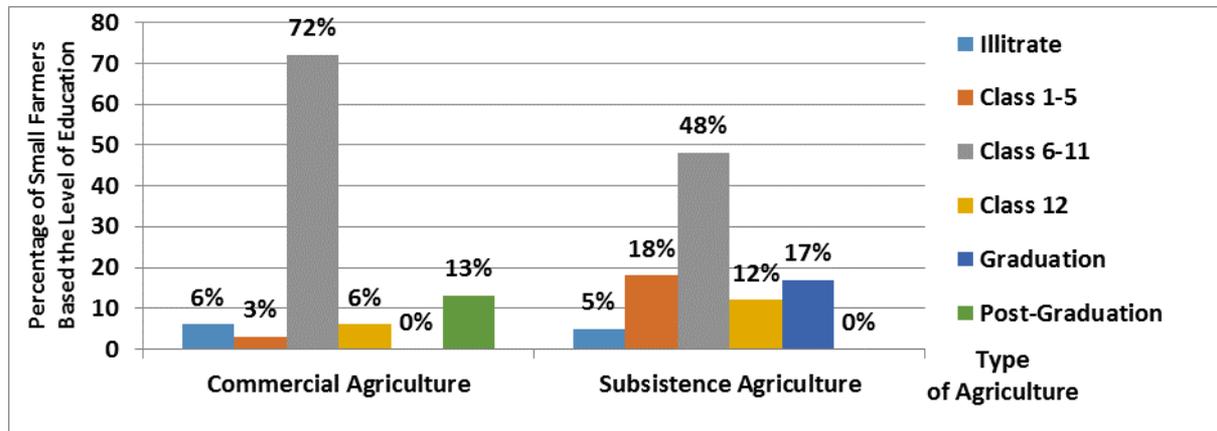
**Chart 2.4. Sex of Head of households Based on the Type of Agriculture**

Source: Field Study



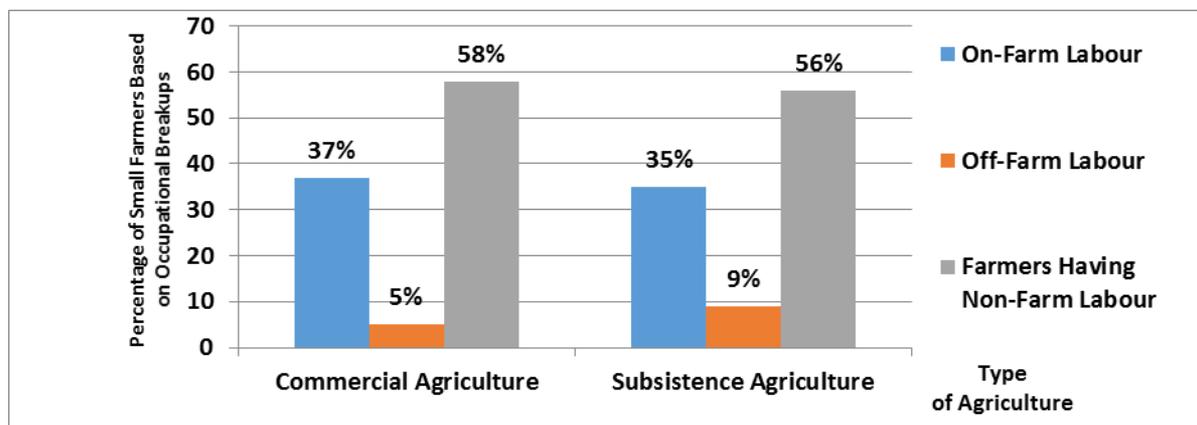
**Chart 2.5. Ages of Head of Households Based on the Type of Agriculture**

Source: Field Study



**Chart 2.6. Educational Levels of Head of Households Based on the Type of Agriculture**

Source: Field Study



**Chart 2.7. Occupational Breakups of Head of Households Based on the Type of Agriculture**

Source: Field Study

On the other hand, 37 per cent and 35 per cent of commercial and subsistence farmers respectively operate their farm land as their only source of subsistence (On-Farm Labour). Farmers who operate others' farm lands as hired labourers (Off-Farm Labour) accounted for 5 per cent and 9 per cent regarding commercial and subsistence agriculture respectively.

**2.8. Status of Caste:**

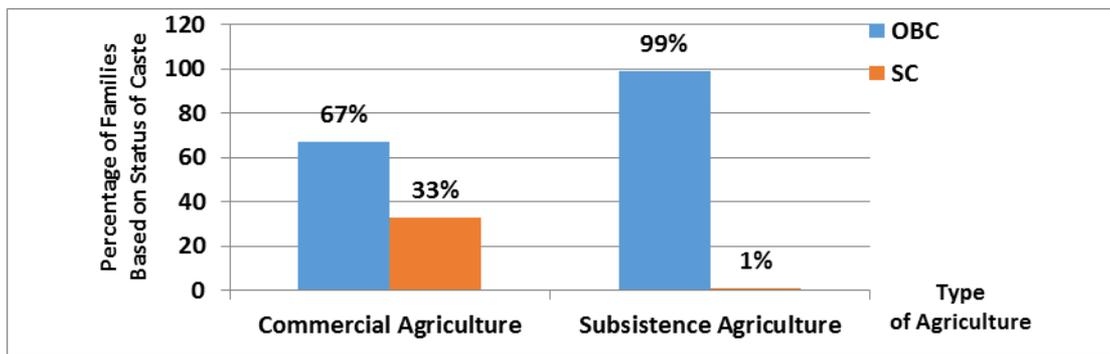
Rural families are mainly classified castes into three categories, which are: scheduled tribe, scheduled caste and other backward class. However in the study area, the families were only divided into two categories; which are: Other Backward Class (OBC) and Scheduled Caste (SC). OBC is a collective term used by the government of India to classify castes which are educationally or socially disadvantaged, and the government of India is enjoined to ensure their social and educational development (National Commission for Backward Classes, 2019).

Scheduled castes are sub-communities of the Hindus who historically faced deprivation, oppression, and extreme social isolation in India and thus the government put them in a schedule for the purpose of providing them constitutional safeguards, according to The Constitution Scheduled Castes Order in 1950.

**Chart 2.8.** explains, that is, the majority values 99 per cent and 67 per cent of subsistence farmers and commercial farmers respectively are Other Backward Class (OBC). However, 33 per cent of commercial farmers and only 1 per cent of subsistence farmers were scheduled castes.

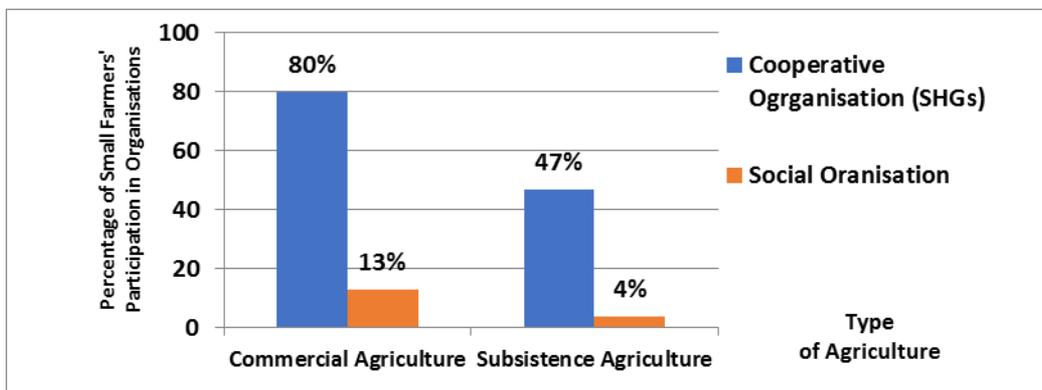
**2.9. Participation of Organisations:**

This includes farmers or their families' members who have a membership of any social organisations or cooperatives in their villages. We found the commercial farmers were more likely to form self-help groups as cooperatives organisations, and also they were much higher involving in social organisations compared with



**Chart 2.8 Status of Caste Based on the Type of Agriculture**

Source: Field Study



**Chart 2.9. Small Farmers' Participation in Organisations Based on the Type of Agriculture**

Source: Field Study

the subsistence farmers; whereas their participation in the cooperative organisations accounted for 80 per cent and 47 per cent respectively, and in terms of the social organisations, their participation were accounted for only 13 per cent and 4 per cent respectively; as shown in chart 2.9.

On the other hand, we observed that the participation of commercial farmers in self-help groups principally included the activities of agricultural production and setting small business, in return, financial help was the main activity which was performed by subsistence farmers. As to the activities of social organisations, the commercial farmers basically performed charity activities, and competitions in sports and arts. However, subsistence farmers performed the public services of hygiene aid and security.

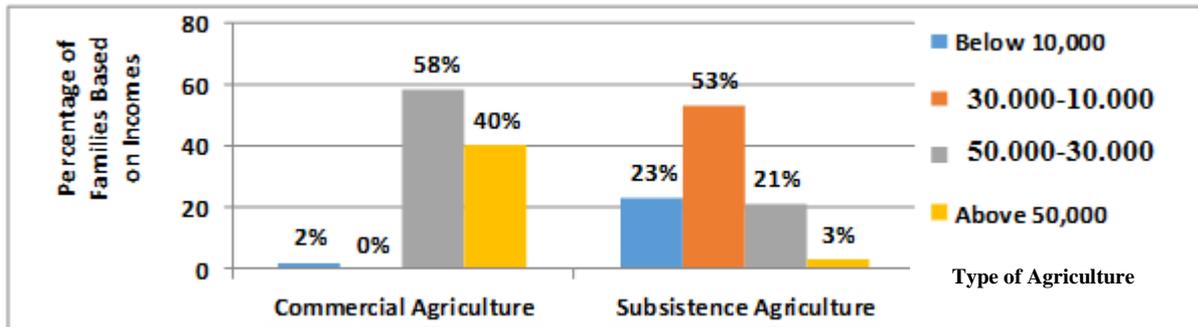
**Chart 2.10.** explains that commercialisation subsistence agriculture obviously generates better incomes for small farmers in the study area, whereas the highest value 58 per cent of commercial farmers belong to the upper-middle category of income 30,000-50,000 rupees, while

53 per cent of subsistence farmers belong to the middle category of income 10,000-30,000 rupees. The second highest value 40 per cent of commercial farmers belong to the high category of income, which is above 50,000 rupees, while only 23 per cent of subsistence farmers belong to the low category of income below 10,000 rupees.

**Chart 2.11.** shows that the highest value 45 per cent of commercial farmers belong to the category of agricultural land of 4-8 bighas, while 50 per cent of subsistence farmers belong to the category of agricultural land of 1-4 bighas.

**Chart 2.11** further shows that the second highest value 30 per cent of commercial farmers belong to the category of 8-12 bighas, while 36 per cent of subsistence farmers belong to the category of 4-8 bighas. Further, 13 per cent and only 2 per cent of commercial and subsistence farmers respectively belong to the highest category of agricultural land, which is 12-16 bighas. However, 8 per cent of commercial farmers and 9 per cent of subsistence farmers were landless.

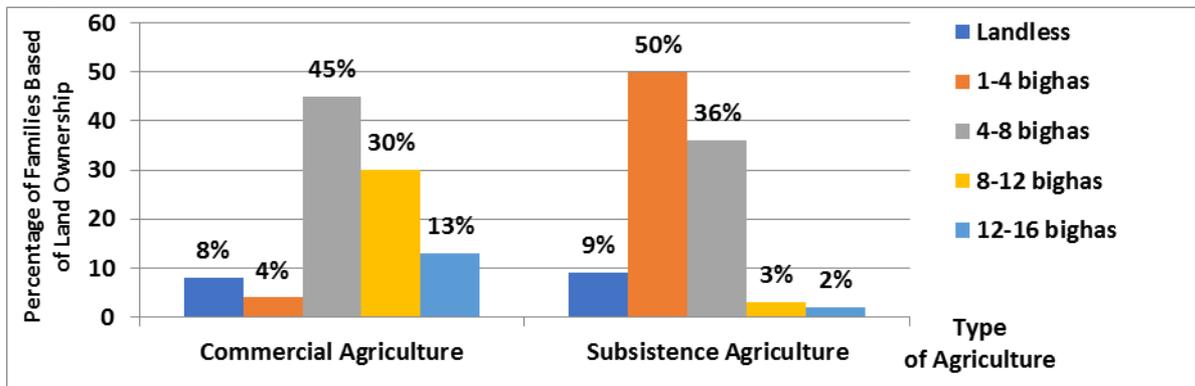
**2.10. Family Income:**



**Chart 2.10. distribution of Family Incomes Based on the Type of Agriculture**

Source: Field Study

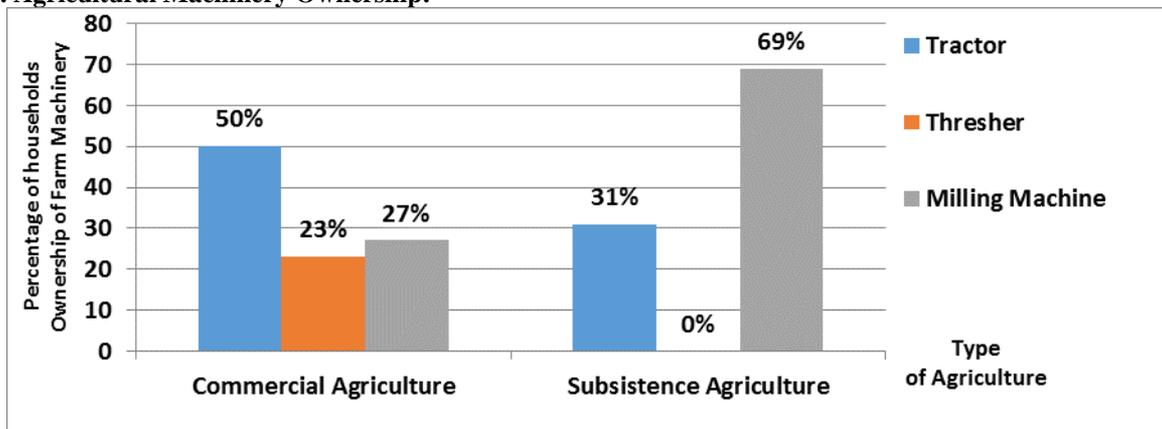
**2.11. Agricultural Land Ownership:**



**Chart 2.11. Distribution of Family's Agricultural Land Ownership Based on the Type of Agriculture**

Source: Field Study

**2.12. Agricultural Machinery Ownership:**



**Chart 2.12. Distribution of households Ownership of Agricultural Machinery Based on the Type of Agriculture**

Source: Field Study

We observed that 50 per cent of commercial farmers and 31 per cent of subsistence farmers had their own tractors; as shown in Chart 2.12. Further, it illustrates the ownership of agricultural machinery by small farmers, including thresher and milling machines. We have found that the thresher machines were owned by only 23 per cent of commercial farmers. However, the milling machines were respectively owned by 27 per cent and 69 per cent of commercial farmers and subsistence farmers.

**2.13. Farm Animals Ownership:**

We observed that subsistence farmers were more interested in raising farm animals than commercial farmers, whereas 83 per cent of subsistence farmers and only 17 per cent of commercial farmers raise chicken. Further 82 per cent of subsistence and only 18 per cent of commercial farmers raised ducks. Likewise, 68 per cent of subsistence farmers and only 32 per cent of commercial had pigs; and 52 per cent of subsistence farmers and 48 per cent of commercial had cows (at least one per household). Conversely, 65 per cent of

commercial farmers and only 35 per cent of subsistence farmers had goats; as shown in chart 2.13.

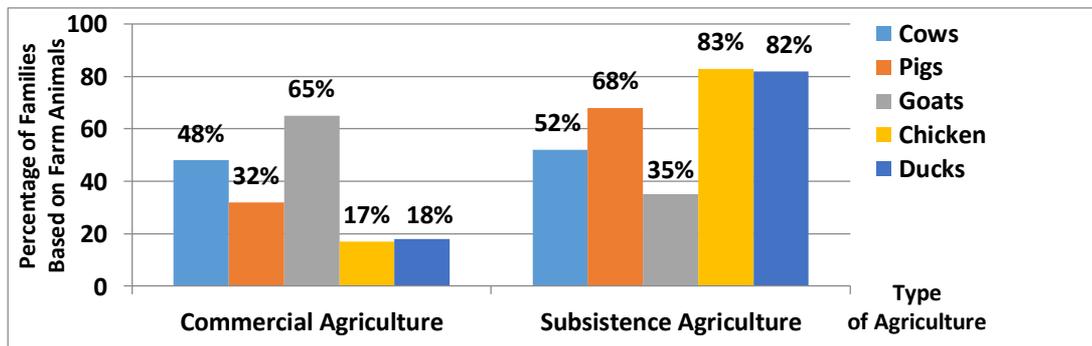
Notably, most subsistence farmers in the study area were more interested in raising farm animals not only for subsistence production, but also to produce labour and commodities such as meat, eggs and milk for sale in the local market.

**2.14 Numbers of Dependents:**

**Chart 2.14** explains that the dependency rate is much higher among households of the subsistence farmers, whereas 79 per cent of commercial farmers and only 11 per cent of subsistence farmers have no dependents among their families' members.

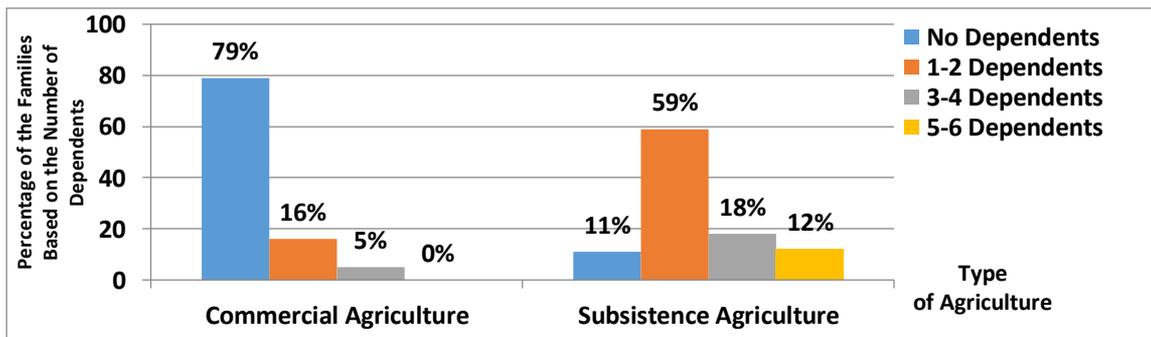
**2.15. Numbers of Earners:**

**Chart 2.15.** illustrates that 48 per cent of commercial farmers and 30 per cent of subsistence farmers belong to the category of 1-2 earners. Further, 49 per cent of subsistence farmers and 45 per cent of commercial farmers both belong to the category of 3-4 earners. However, 21 per cent of subsistence farmers and only 7 per cent of commercial farmers both fall in the category of 5-6 earners.



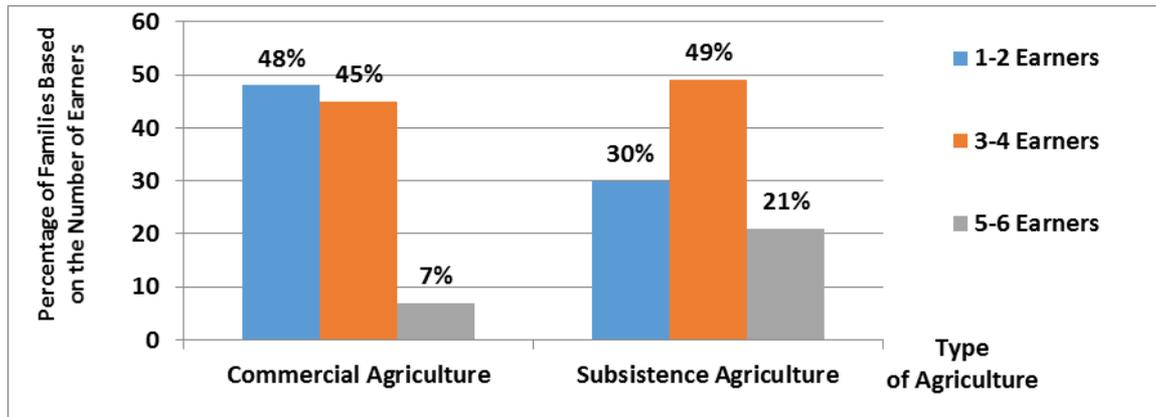
**Chart 2.13. Distribution of Farm Animals Ownership of Family Based on the Type of Agriculture**

Source: Field Study



**Chart 2.14. Numbers of Dependents among the Family Members Based on the Type of Agriculture**

Source: Field Study



**Chart 2.15. Numbers of Earners among the Family Members Based on the Type of Agriculture**

Source: Field Study

## CONCLUSION

From the studying of the labour division along with the rice value chain as well as the socio-economic characteristics of the small farmers, we can deduce the resiliencies and vulnerabilities of commercialisation of subsistence agriculture, as follows:

This study revealed many issues that resemble resiliencies for small farmers to make surplus and to improve their incomes and thus the level of poverty-reducing in their households; as shown below:

- 1.1 Agriculture is a rice culture in Assam. It is an important staple food and widely consumed commodity locally and globally. Consumption drives production because it increases the demanded quantity of the commodity in markets thus helps to increase the production and income generation.
- 1.2 The distance between the rice fields and the marketplace in the study area ranges from 4 to 7 kilometres only. It is not only decreasing the crop loss and transportation cost, but also enhancing the competition and profit for the small farmers.
- 1.3 Rice cultivation in the study area depends on a low cost input (tradition) system, such as rainfed agriculture.
- 1.4 Small farmers use indigenous seeds that provide natural protection against extreme climatic variability, such as floods and drought besides their ability to withstand pests attack. Indigenous seeds are readily accessible to the small farmers that produce high demand rice in the market, (enhancing

small farmers' chance to access rice market profitably), because these seeds show high performance without depending on chemical fertiliser and pesticide that give it unique taste, flavour and cook quality as well as healthful and nutritional quality.

- 1.5 Small farmers have the potential to double their income in case of provision of agronomic practices for value addition, such as packing or manufacturing the product (traditional sweets and beers), as well as provision of modern storage facilities and drying racks.
- 1.6 Commercial agriculture empowered women economically to gain the higher financial status and thus empowering them socially with more power in making-decisions in the family and making relationships with the local traders and the community. Furthermore, commercial agriculture enhanced gender equity and increased women's participation in agriculture which is a successful key for developing the agricultural economy.
- 1.7 Commercial agriculture encourages small farmers to live in joint families, and strengthens the social ties among members of households as well as establishing a kind of cooperative relationship in the community.
- 1.8 The commercialisation of subsistence agriculture obviously generated better incomes for small farmers in the study area, which reflects on enhancing their production also besides reducing the level of poverty in their households.

- 1.9 Female-headed households were likely to be involved in commercial agriculture that could reduce the poverty of such the most vulnerable social group.
- 1.10 The commercial farmers had a higher level of possession of agricultural land and machinery than the subsistence farmers.
- 1.11 The dependency rate was much higher among households of the subsistence farmers than the households of commercial farmers, while the commercial farmers had a higher number of earners among their households. That may be evidence that commercial agriculture can attract young people to farming or persuade them not to leave rural areas to towns by offering better ways to earn money.
2. Conversely, there are some of vulnerabilities that are related to rice production and marketing; including: Small size of agricultural land, extreme variation in the climate with unpredictable rainfall patterns as well as seasonal severe flood and drought, incidence of pests and diseases, low productivity, insufficient production, very limited surplus for the market, high cost of agricultural capital (equipments and machinery), lack of access to agronomic knowledge, high rental prices of tractor and other agricultural machineries, lack of agricultural labourers, failure of agricultural drain systems, high bank lending rate, high prices of improved seeds, High prices of chemical fertilisers, wild animals damaging the crop, Death of farmers' livestock because of the lack of veterinary services

Finally, we summarise two recommendations that may mitigate the vulnerabilities mentioned above; as follows: 1) Establishing infrastructure for agricultural irrigation and drain systems will enable the small farmers to produce all the year and ensure the optimal use of agricultural land and thus increasing and diversifying their agricultural production, as well as enhance their competition in the market, which definitely reflects in doubling their incomes and improving their livelihoods; 2) Contract farming (an agreement between small-scale farmers "producers" and processing or marketing firms "buyers" for the production and supply of the rice) can maintain mutual-benefit for both small farmers and traders; the traders can get a specific product in quantities and quality standards determined by themselves to get high competition and optimal profit in the market, on the other hand, small farmers will provide a degree of production support through the supply of inputs (improved seeds, agricultural machinery, fertilisers, pesticides, finance charge and the provision of technical advice).

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## الملخص العربي

### صغار المزارعين والتحول الزراعي: دراسة سيبيولوجية في ثلاث قرى هندية

مرودة عبد العزيز محمد أحمد وبرنجال سرما

قرى في مركز ديبروجار خلال ديسمبر ٢٠٢١ إلى مارس ٢٠٢٢. وتم تحليل البيانات باستخدام الإحصاء الوصفي.

نتائج البحث أوضحت أن الزراعة تجارية الربح قد مكنت المرأة اقتصاديا واجتماعيا داخل أسرتها والمجتمع المحلي، وقد شجعت صغار المزارعين على العيش في أسر مركبة وعززت مشاركتهم في المنظمات الاجتماعية والتعاونية، وكذلك حسنت مستوى دخل أسرهم المعيشية مقارنة بمزارعي الكفاف مما يدل على أن الزراعة تجارية الربح لها دور واضح في تقليل مستوى الفقر داخل أسر صغار المزارعين.

وقد خلص هذا البحث إلى أنه يمكن تعظيم الاستفادة من الأرض الزراعية من خلال إنشاء بنية تحتية للري والصرف واتباع أسلوب الزراعة التعاقدية لتحسين منافسة صغار المزارعين في الإنتاج والتسويق.

الكلمات المفتاحية: الزراعة التجارية، مركز ديبروجار، شمال شرق الهند، صغار المزارعين، محصول الأرز

الزراعة هي المصدر الرئيسي لمعيشة صغار المزارعين، الذين يساهمون بحوالي ٥١ في المئة من جملة الإنتاج الزراعي و٧٠ في المئة من المحاصيل عالية القيمة. ولكن فهم يشكلون في الوقت ذاته الأغلبية المكونة للجوع والفقر في الهند.

التحول الزراعي أو تحويل إنتاج الكفاف إلى المستوى التجاري الربحي قد يمكن هؤلاء المزارعين من تحسين دخولهم.

هذا البحث يهدف إلى التعرف على تقسيم العمل الأسري بناء على النوع الاجتماعي عند مستوى زراعة الكفاف والزراعة التجارية، وتوضيح الفروق الاجتماعية والاقتصادية بين مزارعي الكفاف والمزارعين التجاريين الذي قد تكشف عن نقاط الضعف والقوة في أسلوب الزراعة تجارية الربح.

أنتجت هذه الدراسة ٢٥٠ مقابلة شخصية مع صغار المزارعين عند مستوى الأسرة المعيشية التي تشارك في زراعة محصول الأرز، تشكل عينة عمدية في إطار ثلاث