

A Study on the Socioeconomics of *Imperata* Grassland Managers at Dargakona Village, Barak Valley, Assam, Northeast India

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Abstract. Socioeconomic profile of farmers has great implications in present days for providing insight into demography, education, income and management of bio-resources. The small scale farmers of rural regions have indeed conserved the indigenous and traditional facts since past generations that eventually redefined as traditional ecological knowledge. Hence, keeping in view, the socioeconomic structure of the villages in Barak Valley region, the grassland managers of agricultural communities could be recognized as a great storehouse of traditional knowledge that play a vital role towards various land recuperation processes. The study was carried out at Dargakona village, Barak Valley, Assam, northeast India with an objective to identify factors that regulate the socioeconomic characteristics of rice farmers and measures to be adopted for improvement of their status. Data were collected from 48 households that were randomly sampled through questionnaire survey and structured interview schedule. The dominant inhabitants of the village were Deshawali (56.30%), Bardhamani (36.70%) and Koibarta (7%) in order of their proportionate share of the population. The average family size indicated almost identical size among the population below 14 years as well as above 30 years of age. Education status expressed low rate of literacy with 41% had no experience of school learning. Roofing pattern of houses indicated maximum use of thatch grass as raw material. The age of the grasslands varied from 10 years to more than 40 years. The rice farmers classified four soil types i.e. 'lal', 'balu', 'athail' and 'citta'. Majority (50%) of the respondents were found with marginal land holdings of one bigha or less. About 23% of the farm natives briefed that the yield of their grasslands amounts to 1000 gollas (a local unit for cash transaction) of dried leaves per annum. Although much of the farmers are in favor of grassland management but still there are people who wants replacement with plantation of economically important species. The *Imperata* grasslands are generally managed for both subsistence and income generation. The study concluded that there is an urgent need of Government, NGO and other stakeholders to intervene and study the issues and challenges of the small scale farmers. Thereafter, proper policies may be formulated in restoration of the degraded grasslands and improving the socioeconomic status of the village communities residing in Barak Valley, Assam, northeast India.

Keywords: Socioeconomics, traditional, thatch grass, smallholder farmer, grassland manager.

1. Introduction

Socioeconomic analysis gives a comprehensive knowledge about the characteristics of respondents that may be useful to recommend reasonable solution of localized issues for enhancement of competence in the rural background (Samarpitha et al., 2016). The socio-economic profile of local people in any place comprises of demography, their occupation, means of livelihood, income and expenditure which altogether regulate the natives to play their role in urbanization (Gupta & Dey, 2015; Shaw & Panda, 2016). However, the poor structure of socioeconomics in the study area makes the whole process of development slow. Grasslands dominated by *Imperata cylindrica* (L.) P. Beauv. not only harbor a good number of species but also provide roofing material to the local people who practice annual harvesting of the grass (Mishra, 1982; Lehmkuhl et al., 1988; Brown, 1997; Pathak et al., 2018). There is significance of *Imperata* grasslands in the villages of Barak Valley, Assam keeping in view the rural background of the inhabiting people. Many of the inhabitants who are basically rice farmers possessed fire climax grasslands dominated by *Imperata cylindrica* (Garrity & Agustin, 1995), a sprouting grass species with high potential of supplying thatch material for the economically backward village people. They are called grassland managers because they maintained the grasslands by traditional procedures for consecutive years of their origin in the abandoned lands. The invasive grass species (*Imperata cylindrica*) invaded and cover the lands that were left fallow by the farmers after completion of sugarcane cultivation. The management of the *Imperata* grasslands by the managers could be linked with the rural economy as they used the matured leaves of *Imperata cylindrica* for purposes like subsistence and profit-earning. Potter et al. (2000) laid emphasis on the economic value and cultural significance of *Imperata cylindrica* grasslands in Indonesia where the focus was mainly on the use of alang-alang grass for roof thatch. The natives of the studied village habitually reside in typical kaccha houses where thatch grass act as roofing material. There is an urgent need for evolving ecological principles of management of these tropical grasslands in order to maximize the yield of thatch grass. However, *Imperata* grasslands of the Barak Valley, Assam are losing value because of the gradual diminishing character in the output and migration of the local population to urban localities for better job opportunities and earning. It is now confirm that *Imperata* grasslands needs rehabilitation and as such managers are in favor of transformation of the grasslands

through plantations of cash crops. Farmers in Indonesia (Hairiah et al., 2000) have initiated reclamation of *Imperata* grasslands with fast growing timber plants, rubber agroforestry, oil palm plantations and pepper/coffee agro forestry. Therefore, the present study was undertaken to characterize the socioeconomics of *Imperata* grassland managers and congregating information of their management strategies at Dargakona village of Barak Valley, Assam, Northeast India. The data generated from the present study would be helpful in framing policy guidelines and future course of research works on restoration of degraded grasslands.

2. Materials and Methods

2.1 Study area

The study area was located at Dargakona village (24°40' N latitude and 92°46' E longitude) of Barak Valley, Assam. The Valley lies between the North Cachar hills on the north and the Mizo hills on the south. The regional landscape marked the presence of hills, hillocks, low-lying stagnant water bodies and the plains. The climate is hot and humid type with total annual rainfall of 2365 mm during the study period. The year is divisible into three distinct seasons viz. short summer (March – April), rainy (May – October) and winter (November – February). The local inhabitants of the studied area are brought from Bengal and Bihar by the Britishers with the onset of tea plantations in the region (Gopalakrishnan, 2000). The small-sized *Imperata* grasslands of Barak Valley, Assam are maintained by subsistence or smallholder farmers whose key occupation is practicing agriculture.

2.2 Methodology

Socio-economic structure of grassland owners (also known as smallholder farmers) was studied thoroughly and one to one interview was carried out by adopting standard questionnaire (Chambers et al., 1989; Disssanayake et al., 2013). This study is based on the information gathered from all the farmers surveyed from the study area. A total of 48 households were randomly sampled and interviewed and the primary data recorded then compiled to represent figures using MS Excel software.

3. Results

3.1 Socioeconomic characteristics

Socioeconomic profile of the target group in the study area is illustrated in Fig.1. The local inhabiting people of the village were dominated by Deshawali (56.30%), Bardhamani (36.70%) and Koibarta (7%) where they integrate themselves with the *Imperata* grasslands of the region. The rural communities are designated as smallholder farmers and practice settled agriculture as prime occupation. The indigenous people have another major role to perform as grassland managers and following culturally management practices. The current survey work indicated that the grassland managers are socially and economically backward ethnic people who reside in the Dargakona village with limited educational background. The size of the family is an important socioeconomic factor as well as indicator of overall development. Total family members of farmers ranged from 2-22 with average family size of 12 persons per household. The number of males in the family varied from 1-11 and females from 1-13. 40% of the household indicated average family size of more than 30 years. The average numbers of males and females in a family were 7 and 6 persons per household respectively. The sex ratio was 114 males per 100 females. The sex ratio showed a preponderance of males over females in the study area. The age of the farmer during the survey work ranged from 35 – 70 years with an average of 46 years. The rice farmers of the village live in the typical houses made of mud with their roofing pattern characterizing thatching with the thatch grass largely *Imperata cylindrica*. Supplementary, there were roofing materials utilized as Vetiver grasses, bamboo leaves and corrugated sheets.

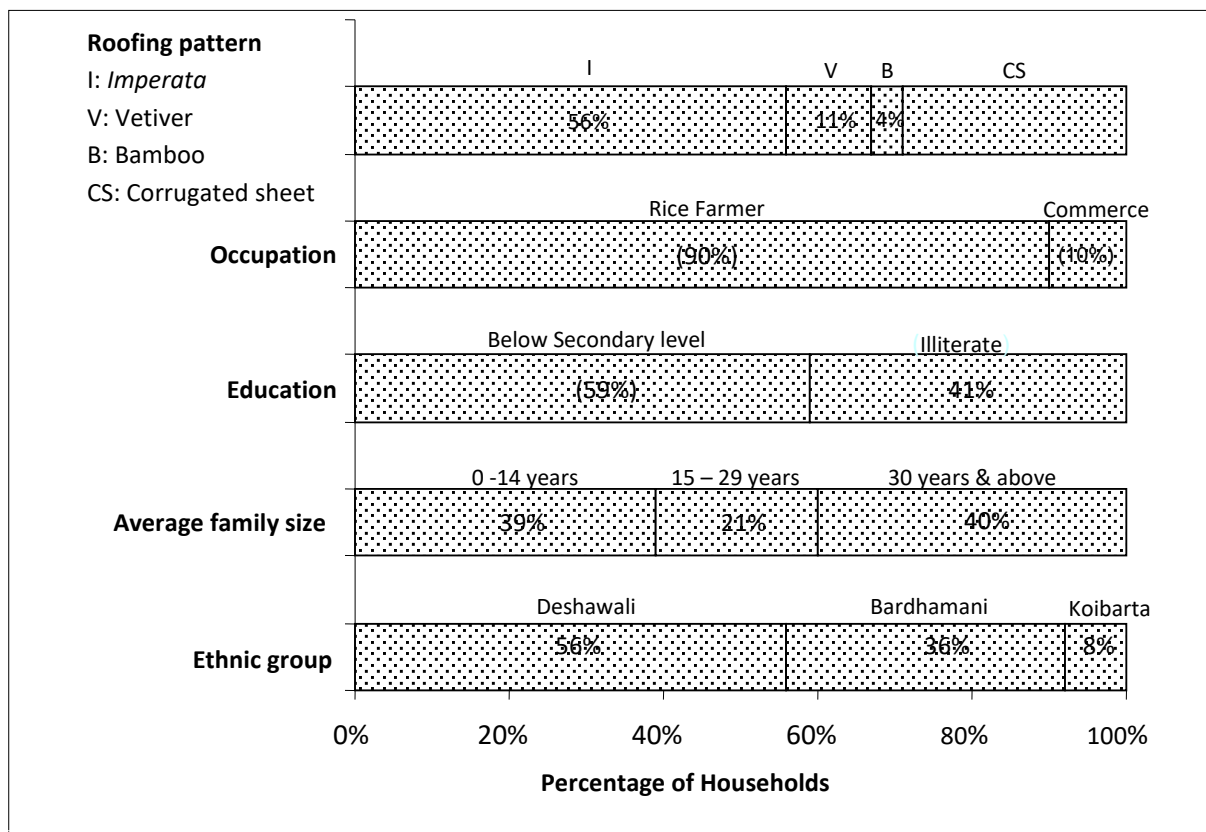


Figure1. Socio-economic characteristics of the grassland managers in the study area

3.2 Grasslands' Origin, size and management

Farmers' assessment on the origin revealed that the *Imperata* grasslands have emerged on the fallow lands where sugarcane cultivation was practiced predominantly by the farmers nearly 40 years ago or more. *Imperata cylindrica* acted as an early colonizer of the fallow land and soon spread as invasive species through seeds as well as belowground rhizome systems. The average age of *Imperata* lands ranged between 30-40 years where maximum household responded (Fig. 2). Majority of the household were found with small land holdings (1 Bigha or 0.33 acre) for the grassland (Fig. 2). These lands acted as one of the major components in the village land use system. They are kept in the arrested succession (seral) state through traditional management practices. Management procedures involve annual harvesting of the matured foliage after senescence, clearing the land and subsequent burning on an annual cycle.

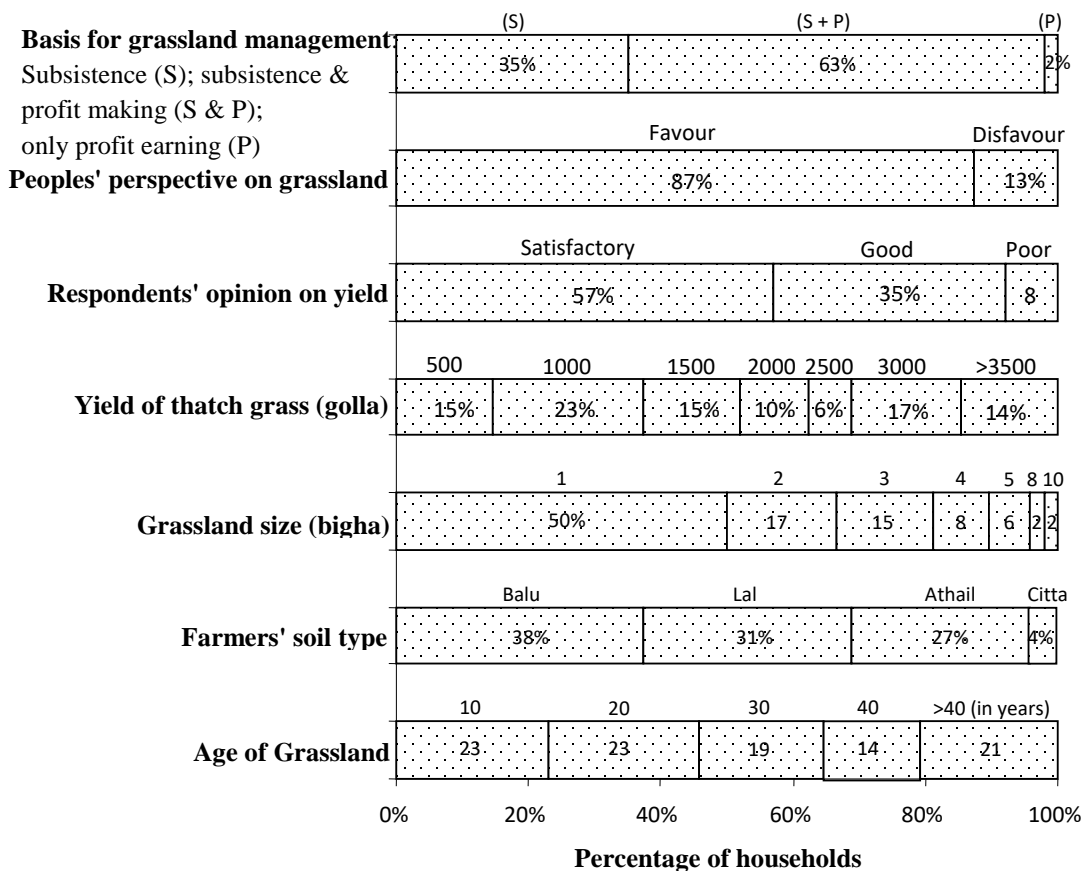


Figure 2. Additional Indicators about *Imperata* grasslands of the study area

3.3 Local soil classification, topography and bio-resource use

In the present study, four types of farmers' soil were classified (*balu*, *lal*, *athail* and *citta*), where *balu* was considered to be dominant and widely distributed (Fig. 2). The *balu* soils are loosely aggregated, light colored and unproductive usually occupied by weedy grass (*Imperata cylindrica*). The topography depicted 'tilla' land distinguished by small hillocks and undulating plains and locally termed as 'shontilla'/'shonkhola'. The tillal land is typical in their appearance with the presence of bamboo grooves operating as hedges on the circumference of grassland. The bamboo species served as cash crop for the farming community in the village. Thatch grass is considered to be traditional bio-resource for the people of study area. The dried matured grass leaf obtained from *Imperata* grasslands are locally called as 'shon' in the regions of Barak Valley, Assam. A co-dominant associated grass species of the locality was listed as *Chrysopogon zizanoides* (L.) Roberty that contribute as another chief source of thatching material for the mud

made houses of the smallholder farmers. The habit of the grass species showed tufts and relish to grow in low-lying and flat lands.

3.4 Farmers' perception on *Imperata* grassland

Farmers' outlook on the various issues of grassland is represented in Figure 2. The grass produce is expressed in terms of 'golla', a unit used by the local people for cash transaction. *Golla* meaning bundle; one *golla* is a bundle of ten dried foliage of thatch grass. The average annual production as informed by the respondents was recorded as 1087.57 gollas /bigha. The overall yield of thatch grass ranged from 500 – 3500 *golla* in one year of growing season. Proportionately, 57% of the grassland managers' were satisfied with the annual productivity of the grass and are thus affirmative in maintaining such grasslands for future benefits. However, a good number of farmers were also reported who wanted land rehabilitation with plantations of economically feasible annual and perennial plants like bamboo, banana, arecanut and local fruit varieties. It is apparent that the *Imperata* grasslands of the study area are kept for purposes like self utilization as well as selling the surplus for profit earning.

4. Discussion

Socioeconomic status of the rural people gives an idea of the participation of the human settlements in various programs at national level (Nath et al., 2021). The local inhabitants particularly Deshawali and Bardhamani communities residing in the Dargakona village migrated from Bengal and Bihar by the Britishers with the onset of tea plantations in the region (Gopalakrishnan, 2000). These communities collectively known as tea tribes are the grassland managers who culturally form a prime bondage with the *Imperata* grasslands familiar in the locality (Pathak et al., 2018). The native population usually reflected the agrarian society with small size farm families and hence classified as smallholder farmers (Gogoi et al., 2020; Sankalpa et al., 2021; Sangwan & Deswal, 2022). In dealing with the grassland management, socioeconomic profile of the rice farmers played a most important role in determining the productive viability of the grass species. Deka & Dutta (2018) in their study mentioned about the socioeconomic status of the villagers in Kaplabeel of Barpeeta district, Assam. Education is one of the most powerful instruments of socioeconomic empowerment. In fact, the level of education has an important bearing on the level of living (Rahman & Ansari, 2007; Gupta & Dey, 2015).

Educational status of the ethnic people were significantly poor and only having meagre experiences of primary standards of school learning, thus illiteracy prevailed within the residents of older generations (Deka et al., 2017; Olarinde & Olusola, 2018). The current study indicated that the village people are socially and economically backward with low per capita income and hence lead a simple life (Disssanayake et al., 2013). The housing pattern showed the existence of typical kaccha houses constructed of mud and bamboos where foliage of two grass species i.e. *Imperata cylindrica* and *Chrysopogon zizanoides* (L.) Roberty are utilized as thatching material. Such roofing types made up of plant material is perishable, less durable and therefore need periodic replacement with fresh set of dried leaves. Potter et al. (2000) while mentioning the importance of grass suggested that *Imperata cylindrica* assumed greater significance in subsistence or contingency sense in many rural economic backgrounds. In the desertified Cherrapunji (North Eastern India) dominated by Khasi tribe, thatch grass (*Imperata cylindrica*) was regularly exploited in hut construction that grew as a secondary successional weed (Ramakrishnan, 1992). Other than the core practice of staple food crop by the rice farmers, *Imperata* grasslands of Barak Valley, Assam, are ancillary maintained by the farmers through traditional management practices. As a part of management procedure, fire is applied as an important management tool for keeping the grassland ecosystem in vegetative state (Astapati & Das, 2010, 2023). The successional tropical grasslands of the region will be attractive and worthy to the local people only if they believe that such land use practices increases their production and per capita income (Friday et al., 1999). As reiterated by the respondents, there is concomitant reduction in grass yield and thereby losing its importance; though the marginal farmers still derive economic benefit by selling thatch grass.

Considering the outcome of the study, the farmers are not in a position to keep the grassland because: (i) there is natural shrinkage of grasslands in the region coupled with plantation of annual and perennial crops, (ii) gradual upliftment in the social and economic status of the farmers and (iii) the ones who are farmers too do not want their children to follow their path of occupation. The farmers rather put their valuable opinion in recuperation of degraded grasslands with cash crops congenial to grow in those areas. Farmers' nomenclature of grassland soils is a treasured information as indigenous knowledge of soils will act as primary database to support the future plantation and rehabilitation programs of unproductive land (Astapati & Das, 2023).

The most credible reason of *Imperata* land conversion is to make the land more productive and beneficial for the farmers. Such steps towards restoration of degraded lands has been started in other parts of South Asia particularly Indonesia (Hairiah et al., 2000). The farmers in Indonesia have initiated reclamation of *Imperata* grasslands with fast growing timber plants, rubber agroforestry, oil palm plantations and pepper/coffee agro forestry. Ramakrishnan (1992) and Nath et al. (2018) discussed the importance of bamboo among the ethnic communities of North Eastern India where they used it for house construction, basket making and other crafts for export. From the study, it is understood that bamboo grooves of Barak Valley, Assam contribute as one of the prominent land use of the village ecosystem. Accordingly, based on its significance, land transformations with bamboo plantations have been initiated in the region, as a step towards land reclamation programs. Keeping in view the farmers opinion and recommendations, it is utmost necessary to value the smallholder farmers and addressed the issues and challenges in bringing out effective output of the grassland management systems. Therefore, the present study explored various factors related to socioeconomic profile that further need to be addressed in a way for better management and improvement of socioeconomic characteristics of tea tribes of the region. As that of other regions of Southeast Asia, agroforestry may be taken as an alternative to reforest *Imperata* grasslands in a sustainable manner and more commonly for a reasonable environmental and economic development of rural areas.

5. Conclusion

It can be concluded that the respondents are generally rice farmers with marginal land holdings and low per capita income their socioeconomics reflected poor living standards. In order to improve the socioeconomic status of the farming communities there should be adoption of policies and recommendations by the stakeholders for bringing out effective policy framing. Moreover, the present findings obtained from the study area may provide crucial platform for preparing policy guidelines. Mass awareness campaign should be carried out for developing the literacy rate and at the same time basic infrastructural facilities in the field of education, healthcare, reliable transport and communication be provided. In line with the farmers' opinion multiple cropping and intercropping may be actively encouraged. The government may take measures to chalk out the issues and challenges in the enhancement of socioeconomic status of tea tribes in the valley. Various extension agencies may visit the Dargakona village and interact

with farmers and thereby offer training for income generating activities. For delivering fruitful results all the suggestions may be implemented in a manner so that development of the backward landscapes is possible in future. For better management and utilization of bio-resources, introduction of technological knowhow is essential that in turn, would improve the socioeconomic standard. Local classification of farmers' soils is vital information for carrying out researches pertaining to soil quality and soil health. A holistic approach would undoubtedly escalate the process of gradual strengthening of the weaker sections of the society and thereby making them a huge mass of human resource. However, there is a scope of further investigations in this regard. A detailed and inclusive plan about the socioeconomic composition of the smallholder farmers in the studied villages will be useful to derive valid inputs useful for policy makers who may suggest better location-specific feasible solutions in transforming the degraded lands into arable soils. Assisted natural regeneration in collaboration with indigenous communities, harnessing local knowledge certainly may be seen as a visionary approach of future research towards reestablishment of tree cover in the unproductive lands of Barak Valley region of Assam, northeast India.

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