

**“TRADITIONAL AGRICULTURAL PRACTICE IN
PYNDENGREI VILLAGE”**



Group Project

SUBMITTED FOR THE PARTIAL FULLFILLMENT
OF THE BACHELOR DEGREE OF ARTS IN GEOGRAPHY


Department Of Geography

NONGSTOIN COLLEGE,

NONGSTOIN-793119

2021


Principal
Nongstoin College
- Nongstoin


HOD. Geography
Shri. P. Dikhar

ACKNOWLEDGEMENT

We would like to express our gratitude to our SUPERVISOR Shri,Playingstar Dkhar, Head Department of Geography for his guidance and constant endeavour for which we could able to complete our project.

We would like to express our sincere gratitude and thanks to the Headman and all the people of Pyndengrei village of Nongstoin Block of West Khasi hills District of Meghalaya State for their support and Cooperation to conduct our project work including data collection and also seeking information relating to our project.

We also sincerely gratitude to our principal for permitting to us to visit Pyndengrei village and at the same time providing financial assistance for undertaking this group project as per the partial fulfilment of the university curriculum.

Last but not the least; we would also like to thank God, the Almighty for his love and constant blessing that He showered upon us.

Dated: 08-03-2021

Place: Nongstoin College


Roll No	Name of the Students
A1813853	HELPUFULSON LYNGKHOI
A1813856	LARIHUN LYNGKHOI
A1813855	BILIBON MARWEIN
A1813857	PYNSKHEMKORDOR LYNGDOH




CERTIFICATE

This is to certify that the students of Sixth Semester, Department of Geography, Nongstoin College, Nongstoin for the session 2020-21 has undergone a Group Project title 'Traditional Agricultural Practice in Pyndengrei village' of Nongstoin Block of West Khasi Hills District, Meghalaya under the supervision of the teachers of the Department of Geography.

This group project is an original work of the students and it has not been published in any form whatsoever. Hence, this report may be placed for evaluation and consideration.


(Shri P. Dkhar)
Supervisor


(Shri P. Dkhar)
Head of Department



Title: Study on Traditional Agricultural Practices in Pyndengrei Village in Nongstoin Block of West Khasi Hills District, Meghalaya

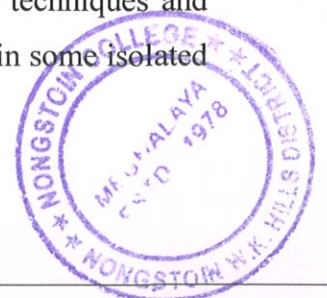
1.0: Introduction

Traditional agriculture is often considered a step between the local hunt and gather practice, which provides communities with subsistence levels of food and the practices of modern agriculture used for mass production of food for global distribution. This traditional agriculture practice develops a balance between meeting our present needs, conserving natural resources and protecting the environment for the benefit of future generations. Traditional agricultural approaches are not practical for mass food production but accounts for a substantial amount of local food production in the developing world.

Agriculture is the main occupation of the people of Meghalaya. About 83% of the total population of the State depends on agriculture for their livelihood. However, agricultural land is accounted as only 48% of the total geographical area of the State. The state offers scope for cultivation of a wide variety of agricultural crops because of highly diversified topography, altitude and climatic conditions. Rice and Maize are the major food crops. Important fruits grown are Orange, Pineapple, Lemon, Guava, Jack fruit and Bananas. Potato, Jute, Cotton, Arecanut, Ginger, Turmeric, Betel leaf, Betel Nut and Black Pepper are the chief commercial crops. Jhum or the Shifting cultivation and Terrace Cultivation are predominant in the State.

The ethnic communities of Meghalaya follow two major types of agricultural practices such as shifting cultivation or slash and burn agriculture and terrace or burn cultivation. Shifting cultivation is practiced in and around forests and terrace cropping is practiced in valleys and foothills and inside plantation forests.

These traditional systems of cultivation practices are well adapted to the environmental are well adapted to the environmental conditions and the traditional knowledge of indigenous communities growing cereals and other agricultural crops have enabled them to maintain an ecological balance. Enormous increases in human population have led to massive coverage of land under shifting cultivation. Besides shifting cultivation and bun agriculture, there are some other potential indigenous farming systems in northeast India developed by the tribal farmers using their ingenuity and skill. These techniques and systems have a sustainable agriculture base and are practiced since centuries in some isolated



pockets of Meghalaya and other north-eastern states. Thus these farming systems make use of locally available resources and indigenous knowledge for their success.

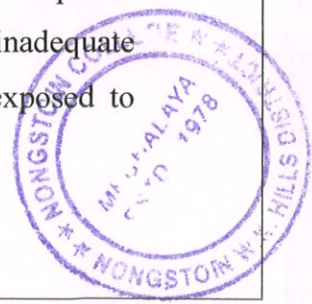
Meghalaya produces a variety of agricultural crops such as food grains, commercial crops, horticulture crops etc. of the total agricultural land in Meghalaya, 62% is used for food grains, 25% for cash crops, 9% for horticultural crops and the rest 4% is used for raising miscellaneous crops. Rice is the most important food crop occupies about 44% of the total agricultural land. About 40% of rice is cultivated from the *Jhum* fields. Sung valley of the Jaintia Hills is considered as the fertile paddy fields of Meghalaya. Meghalaya produces three cropping seasons for rice, autumn rice, winter rice and spring rice. Winter cropping covers 67% of the total production. Maize is the next important agricultural food crop of Meghalaya. It is grown in about 8% of the cropped area and cultivated mainly in the plains of Garo hills, Mairang, Mawphlang in West Khasi Hills and Laskein block of Jaintia hills. Wheat is confined in some pockets of the lower elevation of Garo hills of Meghalaya. Pulses are less important in the agricultural economy of the state. Pulses occupy 1.3% of the cropped area and are confined only in some pockets of remote areas of the *Garo* hills. Potato, the most important commercial agricultural crop covers about 7% of the total agricultural area of the State. It was introduced in *Khasi* hills by David Scott in the early part of the 19th century and grown mainly in the terrace fields of the high altitudes of *Khasi* hills. Oil seeds are grown mostly in the plain areas of the *Jhum* fields of *Garo* hills. Among the Oil seeds, mustard, rape, castor, sesamum and soyabean are grown. Fibre crops, cotton and jute are grown in the *Garo* hills. Ginger is mainly grown in *Jaintia* hills and some pockets of *Khasi* hills. Sugar cane is confined only in plain areas of the state and grown in *Jhum* fields.

The soil and climatic conditions are suitable for the production of horticulture crops. Pineapple, litchi, guava, mango, banana and jackfruit are grown at low altitude and orange, plums, peaches and pears are the major horticultural crops of high altitude.

Tapioca is one of the subsidiary food crops and is grown in western part of *Khasi* hills. Turmeric is famous for its quality and has a great demand. It is widely grown in the *Jhum* and Terracefield of *Jaintia* hills.

1.1: Statement of the Problem

The tribal are often disadvantaged when they try to access basic services such as shelter, drinking water, sanitation, health services and education that enable to build capitals. They live in geographical isolation and remote marginal lands in rural areas with inadequate or non-existent transport, electric supply and access to information. They are exposed to



environmental hazards and are vulnerable to epidemics, floods, famine and pollution. This situation is acute particularly among farming communities in developing countries. Majority of the population in developing countries reside in the rural area and their major source of income and means of livelihood is agriculture. They belong to the agrarian society and they are marginalized from the external world due to limited infrastructures and facilities in developing world. Most of the agrarian society or farmers are peasants that are characterised by small fragmented land holdings. These groups of farmers are highly dependent on rain fed agriculture, which is becoming highly sensitive to erratic rain fall and floods, draughts and disease and pest infestation. Likewise, the small holder farmers of India have similar characteristics and they are also facing similar challenges. 'India lives in its villages' - this proverb seems true at the current era as it was when the country became independent 73 years ago. Keeping in view of the above factors, the present study examines the Study on Traditional Agricultural Practices in Pyndengrei Village in Nongstoin Block of West Khasi Hills District, Meghalaya.

1.2: Objectives

The present study has been undertaken based on the following principal objectives

- (1) To study the agricultural land use and cropping system
- (2) To examine Spatio-temporal changes in agricultural land use in the study region.
- (3) To examine the nature and extent of unequal distribution of land holding pattern among various segments.
- (4) To study the crop production/productivity of the study area.

1.3: Data Used

A. Secondary Data Source

- (i) District Statistical Hand Book, West Khasi Hills
- (ii) Agricultural Statistics of West Khasi Hills
- (iii) Department of Agriculture, Government of Meghalaya

B. Primary Data Source

For primary information, personal observation of the agricultural situation, interviewed through prepared scheduled questionnaires for village as well as household levels. 50 (Fifty) household have been taken into consideration.

The field survey is being carried out with comprehensive questionnaires surveyed from house to house in the selected 50 families, information collected, then tabulated according to land



holding sizes. The classification of land holding size is being made according to the convenient of the researcher.

1.4: Review of Related Literature

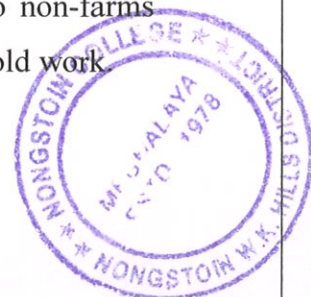
The scientific and systematic studies related to agriculture geography have originated very recently, during the second half of the 20th century. The scientific inquiries based on systematic thinking and factual observations are a sound base of knowledge for research work to be undertaken. A critical and thorough insight of studies already conducted relating to topic of the problem, therefore, becomes imperative for conceptual clarity and methodological improvement in the research work to be conducted.

Salika (1999) while investigating the role of women in agriculture revealed that the proportion of females playing a major or equal role was highest in the selection of crop variety while in financial matters the involvement of women was relatively low.

Studies also shows that there is overwhelming economic contribution of women in productive as well as domestic activities especially in the hill region (Singh and Garcia, 1999). women contribution to the farm work as high as between 60 and 90% of the total farm task performed (Amali, 1998; Auta et al., 2000). Agricultural activities such as seeding, transplanting, weeding, fertilizer application, plant protection, harvesting, processing, storage, etc. were exclusively carried out by women only. Thus, they directly or indirectly influenced the course of agriculture by participating all above agricultural activities (Amali, 1998; Auta et al., 2000; Singh et al., 2004).

The study of women and work participation among the tribal of Northeast India is vital to understand as the culture, the condition of the environment differs from region to region. Hutton (1922) reveals how among the Lothal's women work side by side with men. Perry (1932) relates that Lothal's, women must do a great deal of work to perform. However, among them, overall work whether in the field or in the house are fairly divided between the sexes.

Dutta (1976) also mention about the equitable division of labour between the sexes among the tribe of Arunachal Pradesh. Nengnong (2011) further highlighted that women's activities even though are limited in agricultural activities, extended beyond to non-farms activities where they also have to devote much of their time to family and household work



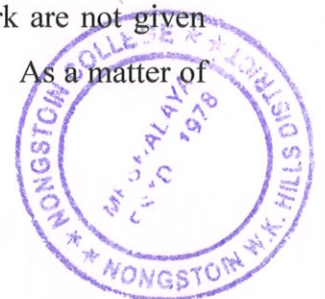
Tuleja (2000) studied the contribution of female agricultural workers in family income and their status in Haryana. The study revealed that female agricultural workers contributed significantly in household income as all farms and the earnings were found most crucial for the landless and small farm households.

A study undertaken in thirteen villages of Bharmaur tehsil by Chauhan (2000) indicated women shared in farm and off - farm income to the extent of 27 and 12 per cent, respectively, giving an overall contribution of 24 per cent in the household income excluding their contribution as home maker. This pointed out to the fact that women contribution and role in agriculture even though seem insignificant in statistical values are worthy of giving fair recognition.

Apart from agriculture, livestock play an important role in supporting women and in improving their financial situation and women are heavily engaged in the sector. An estimated two-third of poor livestock keepers totalling approximately 400 million people are women (Thorton et.al, 2002)

According to agricultural development economics division the food and agriculture organisation of the United Nation (FAO), the time use studies present the precise breakdown of time use by farming activity. Five of the studies covering some cases have information on five common categories-Land operation fertilizer application, needing harvesting and storage. All studies with the exception of Bangladesh (where, for rice, women's time is nearly entirely spent on post harvesting activities) found needing to be predominantly female activities, followed by harvesting and fertilizers application. Women are typically involved in all other activities but did not provide a majority of labour; Women overwhelmingly provide the greatest proportion of household time spent on food processing and preparation. If these aspect of food preparation are include, Women's labour share could well exceed 60% in many African countries.

Women make up nearly 50 per cent of the world's population, comprise 33 per cent of the official labour force, perform about 70 per cent of working hours whilst receiving only 10 per cent of world's income and own even less than one per cent of world's property. Due to these statistical hard facts the relevance of women-based study has been felt inevitable today. Their importance as a workforce has been either neglected or misrepresented especially in developing nations. Many activities of women in economically gainful work are not given proper recognition both in terms of quantitative as well as qualitative aspects. As a matter of



fact very little of their participation and assistance in agricultural and non-agricultural activities linked to production are evaluated (Chermont, 1987).

There has been emerging trends in relation to women participation in agriculture. Women are no longer stuck in the kitchen or doing just household chores or petty farm operations. Education and employment had helped to change the role performance, decision making and behaviour patterns, for egalitarian relations. With education, the number of job-seekers among women tends to increase considerably and at a rate much faster than among their male counterparts (AlaghN.Sharma and Seema Singh, 1993).

1.5: Methodology

Though West Khasi Hills District in general is rich in various minerals and other resources but the state's economy is primarily based on agriculture. West Khasi Hills is one of the best agricultural regions of the state but the agricultural sector is still at subsistence level and the farmers are economically poor.

1.6: Chapter Scheme

The present research work relating to the agricultural land use and the productivity pattern in West Khasi Hills. The Chapter Scheme of present study is being designed as follows:

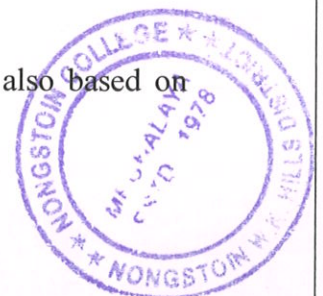
The Chapter-I is the introductory chapter and its starts with the statement of the problem associated with the objectives. It also incorporates the relevant literature survey.

The Chapter-II deals with the background of the study area, geographically setting, climate, topography and forest and water resources of the study region.

The Chapter-III discusses the general land use pattern and changing pattern of general land use in West Khasi Hills and general land use pattern and changing pattern of general land use in Pyndengrei Village.

The Chapter-IV is concerned with the agricultural production/productivity. The Chapter is based on secondary sources of data collected from the Department of Agriculture, of West Khasi Hills and the primary data collected during field survey.

The Chapter-V is concerned with the farm size attributes. This Chapter is also based on primary data.



The Chapter-VI is essentially restricted to the summary and conclusions of the overall work with certain recommendations.



CHAPTER-II

BACK GROUND OF THE STUDY AREA

2.1: Introduction

Meghalaya is one of the most picturesque states of India offering a spectrum of sylvan surroundings, rich cultural heritage and luxurious vegetation comprising of a large variety of flora and fauna. Meghalaya is one of the seven sister states of the North-eastern region, bounded by Assam and Bangladesh. Bangladesh forms the southern boundary of this state. It is among the wettest places on earth and is the home of an extraordinary diversity of people that includes the *Khasi*, *Jaintia* and *Garo* tribes.

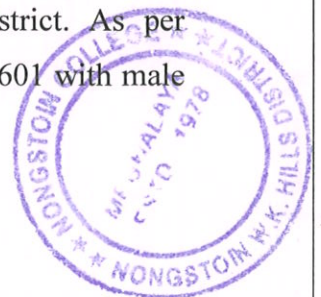
Meghalaya experienced two distinct seasons i.e. winter and monsoon and is characterised by a cool climate throughout the year. There are numerous rivers flow through Meghalaya although none of them are navigable due to steep slope, rocky beds followed by strong water currents.

The original inhabitants of this state are *Khasis*, *Jaintias* and *Garos*. *Khasis* and *Jaintias* are Mongolian race where as the *Garos* belong to the Tibet-Burman race. Their cultural traits and ethnic origins remain distinctive, mainly due to their geographical location. The *Khasi* language spoken here is believed to be one of the few surviving dialects of the *Mon-Khmer*.

As per constitution of India and Panchyati Raaj Act, Pyndengrei village is administrated by *Rangbah Shnong* (Head of Village) who is elected representative of village.

2.2: Geographical Setting

West Khasi Hills district is the largest district of Meghalaya covering 23% of the total area of the state. The district lies between Latitude 25°10' and 25°51' N and Longitude 90°44' and 91°49' E with a total geographical area of 5,247 sq. km. It is bounded on the north-west by Kamrup district of Assam, on the north-east by Ri Bhoi district, on the east by East Khasi Hills district, on the south by Bangladesh, on the west by East Garo and South Garo Hills districts. West Khasi Hills district was carved out from Khasi hills on 28.10.1976. The district headquarters is Nongstoin which covers an area of 76 sq. km. Mairang, Mawshynrut and Mawkyrwat are the three civil Sub-Divisions of the district. As per provisional 2011 census, the population in this hilly and tribal district is 3, 85,601 with male



population of 1, 94,628 and female population of 1, 90,973. The main occupation of the population in the district is agriculture.

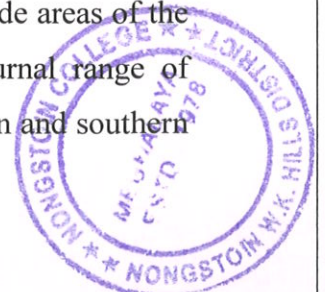
The area is located in the eastern part of West Khasi Hills with general altitude of 900 to 1400 m above mean sea level and forms part of the central upland zone of the Meghalaya Plateau. This portion of the plateau consists of rolling uplands. Denudational low and High Hills occupies the major part of the area comprising of archean gneissic complex with patches of granite rocks. It is moderately dissected by fractures and joints forming a good number of narrow intermontane valleys.

Pyndengrei village is located in Nongstoin Block of West Khasi Hills District in Meghalaya, India. Pyndengrei has a total population of 3342 peoples. There are about 755 houses in Pyndengrei village. Pyndengrei is a medium size village located in Nongstoin Block of West Khasi Hills District, Meghalaya with total 755 families residing. The Pyndengrei village has population of 3342 of which 1721 are males while 1690 are females. In Pyndengrei village population of children with age 0-6 is 375 which make up 21.74 % of total population of village. Average Sex Ratio of Pyndengrei village is 896 which are lower than Meghalaya state average of 989. Child Sex Ratio for the Pyndengrei as per census is 829, lower than Meghalaya average of 970.

Pyndengrei village has higher literacy rate compared to Meghalaya. In 2011, literacy rate of Pyndengrei village was 88.52 % compared to 74.43 % of Meghalaya. In Pyndengrei Male literacy stands at 89.36 % while female literacy rate was 87.60 %.

2.3: Climate

The Climate of the district varies in latitudinal and longitudinal directions and is influenced mainly by physiographic. There are four seasons in the district namely summer, monsoon or rainy, autumn and winter. The summer season extends from the end of March to mid-May, which is characterized by relatively high temperature, occasional thunderstorm with high wind velocities. The rainy season commences with the onset of southwest monsoon in April and lasts up to October. This is followed by short autumn from mid-October to November. This season indicates the slow retreating of monsoon with clear and sunny sky. The winter season extends from December to the end of March. This is the coldest season of the year with sharp decline in the temperature. During winter, some high altitude areas of the state experiences very cold nights. Winter is basically dry with lower diurnal range of temperature. In general, the district has a mildly tropical climate in the northern and southern



foothills, whereas central upland portion experiences temperate climate and the places of medium altitude of the northern, southern and western parts of the district experience sub-tropical climate. The district receives a fairly high rainfall throughout the year. Most of the precipitation occurs during the rainy season i.e. between April and October due to SW monsoon. The average rainfall in some of the selected stations of the district is presented in Table 1.3.

Table 2.1: Average Rainfall (mm) of Selected Stations in West Khasi Hills

Selected Stations	Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec	Total
Nongstoin	15.4	19.5	110.7	245.2	355.5	707.9	985.8	542.6	361.3	224.6	32.41	7.21	3608.06
Mairang	21.1	17.2	61.9	115	276	520	637	342	255	220	32.6	7.02	2505.7
Riangdo	21.3	30.4	58.3	198	359	563	677	575	358	202	30.2	7.32	2986.6

Source: Directorate of Agriculture, Shillong

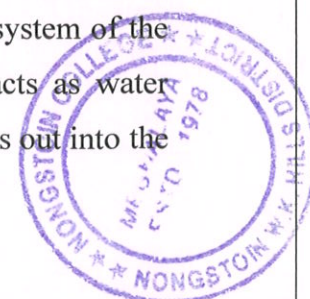
It is observed that June, July and August are the periods when the district receives the maximum rainfall and highest rainfall occurs in the month of July.

2.4: Land Use

The district has a forest area of 2065.30 sq. km. that is about 40% of the total area. The net area sown is 301.22 sq. km. and the total cropped area is 366.89 sq. km. Thus, in West Khasi Hills district, fallow land covers about 13%, net area sown is about 6%, and the total cropped area is about 7%.

2.5: Geomorphology and Drainage

Geomorphologically the district is an undulatory terrain with the E-W trending Khasi hill ranges of Central Upland zone. The West Khasi Hills district also represents the remnant of ancient plateau of Indian Peninsular shield that is deeply dissected suggesting several geotectonic and structural deformities that the plateau has undergone. The average altitude of the Central Upland is about 1,300 m above Mean Sea Level. The highest peak is “Kyllang rock” touching a height of 1774 m.amsl (metres above Mean Sea Level). Mawthadraishan range, trending east – west, is the most significant hill range of West Khasi Hills District. Other northern, southern and western parts have a general altitude of 150 to 900 m.amsl. Geomorphologically, the district represents denudational hills of old gneissic and schistose rocks except in the southern parts where highly dissected plateau are observed. Few narrow elongated intermontane valleys are seen along major lineaments. The drainage system of the district is controlled by topography. The east-west trending central upland acts as water divide dissecting the district into two drainage basins. The northern system drains out into the



mighty Brahmaputra River in the adjoining Assam state and the major drainage system in the south drains into the Meghna basin merges into the Bangladesh plains. Kynshi is the major river that originates in the southern slope of Marpna peak near Mawmaram village. This river is joined by number of tributaries on its westerly course ultimately draining into Bangladesh. Another River Khri rises near Kyllang rock flowing northward into Assam plains. Other important Rivers of the district are Umngi, Wahblei, Riangdo, Rilang, Tyrsung, Ryndi, Rwiang etc. The drainage pattern of the district is angular to sub-angular and is found to be structurally controlled. Broadly, the district can be differentiated into the following geomorphic units.

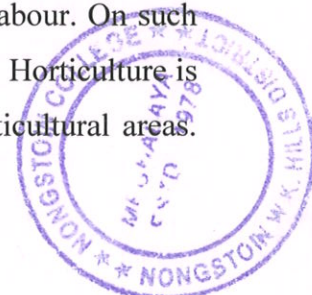
- Denudational Low and High Hills: It occupies the major part of the district comprising of hard rocks like granite and gneiss. It is moderately dissected by fractures and joints forming a good number of narrow intermontane valleys.
- Dissected Plateau: It is found in the southern portion of district comprising of soft and friable rocks like shale, sandstone and quartzite.
- Deep Gorges: It is exposed in the southern parts comprising of Tertiary rocks like sandstone, shale and limestone.

2.6: Soil Type

The district shows different types of soil as the provenance differs widely. Red Gravelly and Red Loamy Soil are the common soil types. The soils are acidic in nature and comparatively rich in organic matter and nitrogen but poor in phosphorous.

2.7: Agriculture and Irrigation

Agriculture, though not much, is still the main occupation of the poor rural people. Only 3% of the total geographical area is sown. Mainly shifting or Jhum cultivation is practiced. About 12.44% of the total population is engaged in such cultivation. The principal crops grown in the district are rice, maize, millets, oilseeds and pulses. Horticulture products include orange, pineapple and banana. Vegetables like potato, sweet potato, ginger, garlic etc. are grown. Broadly the low lying areas are put under paddy during Kharif and with pulses, paddy, vegetables and oilseeds during the Rabi season depending on the availability of residual moisture and irrigation facilities. Gentle slopes up to 20% are put under other crops like wheat, paddy, maize, pulses, oilseeds, vegetables etc, which not only contribute towards food security but also yield substantial revenue returns per unit of land and labour. On such slopes the concept of watershed management of land and water is encouraged. Horticulture is taken up on slopes above 20% and Border Areas, which are traditional horticultural areas.



Forest cover in the State (40%) is below the national norm of 60% recommended for hilly areas. This is because a sizable proportion of the Forest area is reportedly under shifting cultivation resulting in depletion of the Forest Cover. A very meager proportion of the geographical area is net sown area, including area under shifting cultivation. The potential net sown area could be increased if and when the fallow lands are utilised for cultivation purposes. The cultivable waste land of the state is 27.4% of the geographical area a part of which might be progressively utilised for cultivation purpose in the long run. The cropping intensity of the state is 121%. Although at present no hydel/thermal project is existing in the district, some are in the execution stage like the 240 MW Nongjiri and 450 MW Kynshi project. There are only minor irrigation schemes in Mairang Block and hence the agricultural development in the area is dependent on it. The existing irrigation schemes are based only on surface water. Majority of the projects are flow irrigation type as the district is hilly.

2.8: Ground Water Resources

The dynamic groundwater resources have been assessed based on Ground Water Resources Estimation Methodology of 1997 (GEC 97). In this methodology, two approaches are recommended – water level fluctuation method and rainfall infiltration method. As the data of ground water level is insufficient, the rainfall infiltration method is used for calculating the resource estimation of the district. Moreover, hilly area having slope of more than 20% are not taken into consideration as they are not worthy of recharge. Hence, the remaining area is delineated into command and non-command area and assessment is done for both monsoon and non-monsoon seasons.

As per the Rainfall Infiltration Factor method, recharge from rainfall is given by the following formula.

$$(R f) = RIF * A * NMR$$

Where RIF = Rainfall Infiltration Factor

A = Area of computation for recharge.

NMR = Normal Monsoon Rainfall

Recharge from sources other than rainfall, ground water irrigation, recharge from ponds and tanks, check dams, *nalla*, *bunds* are taken as nil for the district and only surface water irrigation is taken into account. The total annual recharge is obtained as the arithmetic sum of recharge from rainfall and the recharge from sources other than rainfall. Thus, Ground Water Resource Potential (as on March 2009) in ham is as follows (Table 2.2 and Table 2.3).

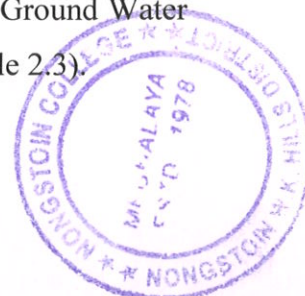


Table 2.2: Net ground water availability (ham)

Annual Replenishable GW resources				Total annual ground water recharge	Natural discharge during non-monsoon season	Net ground water availability
Monsoon Season		Non-monsoon Season				
4312	Nil	914	Nil	5226	522	4704

(Source: Irrigation Department, Government of Meghalaya)

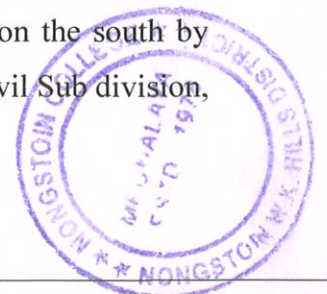
Table 2.3: Categorization of ground water resources

Net Ground water availability	Annual GW draft			Domestic and industrial uses upto 2025	Ground water availability for future irrigation	Stage of ground water development (%)	Categorization
	Irrigation	Domestic and industrial uses	Total				
4704	Nil	2.03	2.03	1293	3411	0.04	Safe

The total annual ground water recharge in the West Khasi Hills District is 5226 Ha m (Hectare metre). The Net annual Ground Water Availability of the West Khasi Hills District works out to be 4704 Ham after deducting the natural discharge during non-monsoon season. At present there is no Ground Water draft for irrigation and the annual domestic draft is 2.03 Ha m, the Gross Ground Water draft for all uses is 2.03 Ha m. The annual allocation for Domestic and Industrial uses has been made as 1293 Ha m based upon the population data projected up to the year 2025. Thus the Net Ground Water Availability for Future Irrigation use works out to 3411 Ha m. The over-all stage of ground water development of the West Khasi Hills District is a meager 0.04% and hence categorised as SAFE. Ground water development is yet to be picked up in the district. Thus, there is abundant scope for utilization of available ground water resources in the district.

2.9: Topography

The District lies in the central part of the State of Meghalaya and is situated between approximately 25 degrees 10' and 25 degrees 51' N latitude, and between 90 degrees 44' and 91 degrees 49' E longitude. It is bounded on the north-west by Kamrup district of Assam, on the north-east by Ri-Bhoi district, on the east by East Khasi Hills district, on the south by Bangladesh and South West Khasi Hills district, the erstwhile Mawkyrwat Civil Sub division,



on the west by East Garo and South Garo Hills districts. The district comprises an area of about 5,247 sq.kms which is 23 percent of the total area of the state. Nongstoin, covering an area of about 76.00 Sq. Kms, is the Headquarter of the District.

2.10: Forest

According to Forest Survey of India (FSI) Report, 2003 the actual forest cover in Meghalaya is 16,839 sq.km which accounts for 75.08% of the States total geographical area, leaving only about 24% non-forest land. The FSI had also classified forests into three categories viz. Very Dense., moderately Dense and Open Forest. West Khasi Hills have 40.3% of dense forest and 59.7% open forest out of 73.51% total forest cover in the district.

2.11: Water Resources

The area is drained by the WahBlei River and its tributaries along the eastern portion of the area running from northeast towards the south.



CHAPTER III

ANALYSIS OF WOMEN PARTICIPATION IN AGRICULTURE

3.1 Introduction

The participation of tribal people in agricultural activities is determined by their socio-economic status of the society. It can also be seen that the Pattern of work reveals the economic status of the tribal people and the social system prevalent in the society. It can also be seen that in the in the field of agriculture , people's participation is insignificant even though most of the work remain unrecognized, under value and unpaid, they are one of the crucial development forces in the world.

In this chapter, an attempt is being made to understand the participation of tribal people in agriculture which is supposed to be the important resource based.

3.2 General socio-economic structure of Pyndengrei village

The nature and pattern of agricultural participation and employment in Pyndengrei village is dependent on the nature of the environment in which they performed.

A study of the socio-economic structure of the village shows that most of the tribal people are dependent on agriculture as their source of livelihood. It is however pertinent to note that even though agriculture forms the basis of the economy of this village, the percentage of cultivators has drastically decline due to loss of their crops. This can be seen that most of the agricultural is considered marginal, unrecognised and unpaid. As per the study, shows that participation of people in agricultural activities has slowly decline over the years. Educational development can be attributed as one of the factor that has affect the migration of people from farms based activities to other well paid and well recognised activities.

Considering the resource base of the village, agriculture and horticulture forms the activities of most of the household. Paddy cultivation is still an important crop where most of the household still participated as their daily activities. The farmers cultivated paddy as a summer crop. During winter some households have resorted to the cultivation of vegetables. Broom is another agricultural activity where most of the farmers have adopted this type of cultivation. This also requires a lot of agricultural labour during cleaning, burning and harvesting. There are also a fair number of farmers who are doing pineapple cultivation as one of the main source of livelihood. Ginger cultivation is also one of the main sources of livelihood of the people of this village as people occupy acres and acres of cultivated land by



shifting their cultivation from one year to another and then repeated to the same field after a cap of three to five years depending upon the fertility of the soil.

3.3 Occupational structure of Pyndengrei village

The agricultural participation of tribal people is greatly determined by the character and the socio-economic of the society. Further, the work participation rates of the occupational pattern of people in different economic pursuits certainly reveal the economic status of the women and the social system prevalent in the tribal hilly areas. The tribal People's economic contribution is immensely significant, and it also considered being one of the crucial development forces. It can also be seen that a large proportion of the economically active women especially in the hilly tribal areas like ours is engaged in agriculture and other allied activities. Agriculture employs three fourth of all economically active women they also make one third of the agricultural labour force and a little less than fifty% self-employed farmers.

Table 3.1: Occupational structure of Pyndengrei village

Sl No	Type of work	Male		Female	
		nos	%	nos	%
1	Cultivators	111	22	310	20
2	Wage labourers	310	20	118	16
3	Petty traders	72	4	55	10
4	lumbering	65	10	0	0
5	Salaried(govt&pvt)	230	40	125	50
6	Others	234	4	122	4
7	Total workers	1018	100	728	100

Source: Field survey, 2021.

The occupational structure among the workers in Pyndengrei village is an indicator of the role played by them. The main workforce in this village is higher in salaried class which accounts for 40 % male and 50% female as compare to the agriculture field which accounts 22% for Male and 20% for female. Thus it is observed that there is a decline in the field of cultivator due to inadequate of productive employment opportunities leading to the withdrawal of tribal people from active cultivation. The increase commercialization in agriculture, underpaid work for women, better education etc. can be seen as the main causes of the decline. Currently cultivation is carried out by daily wage labourers sourced out both from the village and from outside the village as well.

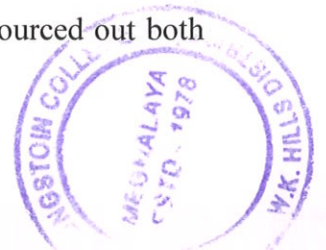


Table 3.2: Decision making process

Activity	Male	Female
Crop selection	11	91
Seed treatment	12	
Fertilizer selection	19	
Sale of produce	71	61
Storage of grain		41
Care of animals	31	21
Farm Investment	21	
Purchasing of land	51	11
Hiring of labour	141	
Crop selection	11	91
%	90	60

Source: field survey, 2021

The above table clearly indicates the larger role played by men in terms of decision making in relation to farm activities with 90% while women involves only on a part of the decision process with only 60 %. Decision making involves decision of investment to be made which will be determined by climate, market factor, financial and capital availability and family requirement. Decision making are largely made by the men as the head of the family in consultation with the women.

Sexual division of labour in the workforce is firmly rooted in socio-cultural traditions and has shown little substantial change over the last few decades. In almost all societies women and men have differing roles and responsibilities within the family and in society, experience different social realities, and enjoy unequal access to and control over resources. It therefore follows that gender is an important social determinant of division of labour within every social group, across different castes, races, ethnic or religious groups.

Men and women perform different tasks and occupy different social and often different physical, spaces. The division of labour by sex is largely a social construct and gender ideology reinforces the notion that women's work at home is not real work for which men were reluctant to share their domestic and childbearing and rearing roles, upon which women dedicate an important part of their lives.



Table 3.3: Division of labour

Activity	Performed by men only	Performed by female only
Ploughing	151	
Field preparation	116	61
Seeding	1	51
Transplanting	1	12
Weeding		12
Harvesting	114	111
Carrying harvested crop	1	15
Thrashing	151	221
Husking	11	51
Preparation of food		111
Livestock maintenance	15	121
Kitchen gardening		151
Horticulture	21	161

Source: Field survey, 2021

The above Table reveals that there are not many differences in the sexual divisions of labour in the village even though much of the physical demanding work is taken up by men. It is seen that most of the pre-harvesting operations are taken care by men, especially ploughing the field. Farm animals and machinery are operated by men. Harvesting and other post-harvest operations like manual thrashing, husking (manual) etc. were largely taken up by women folks. Women and men also are engaged in livestock rearing. While kitchen gardening is solely the responsibility of women. It can be noted that women plays multiple roles and shoulders more responsibilities since in addition to farm works, they have to take care of household activities and family matters. Even though men also shares responsibilities in family and household works, a large portion of the women's contribution is unrecognised and hence unpaid or underpaid. Thus there is a need to broaden the awareness on gender roles and educating women and the society on the need of equity so as to bring about a positive social transformation and bring about more participation from the women folks.



Table 3.4: Reasons for taking up agricultural activities

Support family		Economic reason (income)		Tradition		Any other	
Nos.	%	Nos.	%	Nos.	%	Nos.	%
12	40	30	100	20	67	15	50

Source: Field survey 2021

**Total Household Surveyed-50 households

In regards to the reasons for taking up agricultural activities it can be seen agriculture as a source to support family and improve economic condition of households are the sole reason. This shows the fact that agriculture even though as shown earlier to be a declining source of occupation, it still maintain its importance as the source of bread provider for the rural families. 50% of the households maintain that agriculture and related tasks are taken up to diversify food production and food availability since most rural households are depending on agriculture for access to diverse food products.

Table 3.5: Animal husbandry and livestock rearing

Types	household	Owned*					Earnings/year**				
		1	2	3	4	5	1	2	3	4	5
Cattle	5	1	4				2	3			
Pigs	25	25						25			
Poultry	27		22		2	3	20	2			5
Fishery	3	3								1	2
Bee keeping	6	6					6				

*owned: (1)-less than 3; (2)- 3 to 6; (3)- 6 to 9; (4) – 9 to12; (5) – 12 above

**earnings/annum: (1)-less than 5000; (2)- 5000-10000; (3)- 10000-15000; (4) – 15000-20000; (5) – 20000 above

Types	household		Owned in %					Earnings/year in %				
	No's	%	1	2	3	4	5	1	2	3	4	5
Cattle	5	17	20	80				40	60			
Pigs	25	83	100						25			
Poultry	27	90		81		7	12	74	7			19
Fishery	3	10	100								33	66
Bee keeping	6	20	100					100				

Source: Field survey, 2021



Livestock rearing and animal husbandry are the main allied activities of agriculture and are widely undertaken by most families in the village. These occupations also provide more diverse food as well as more income to the family. Women are the major worker in these occupations since the males are more concentrated into works which are physically demanding. Except for activities such as fisheries and cattle rearing, where the male are the main worker, other activities such as piggery, bee-keeping, poultry rearing are the responsibility of the women workers. These activities can also be seen as one of the source of income. The generation of income from these activities helps in improving overall household economy.

17% of the households surveyed undertake cattle rearing, 83% piggery, 90% poultry, 10% fishery and 20% bee keeping.

Poultry rearing and fishery are the major revenue earning activities with about 19% household and 66 % households earning above Rs.20, 000 annually from these activities. While bee keeping performed the lowest in terms of revenue earning since only few household undertake this activity. The contribution of women can be seen here to be prominent as the activities which are their responsibility such as poultry, piggery are the major revenue earner for the families. Thus we can conclude that the role of women in agriculture in improving household economy as revenue earners should be given due recognition even though in most cases such activities are considered as part of household chores and not given monetary benefits.

The participation of tribal people shows that women has a very strong role and responsibilities to play right from the time they get up from bed till they retire to bed, and the responsibilities felt on them. In the agricultural aspects women had to devote their time to field management and resources. At home they had to take the care and responsibilities for the children and for the house and therefore women had a very little time for themselves and all the responsibilities are cantered on them which they cannot escape.



CHAPTER IV

SUMMARY OF FINDINGS, SUGGESTIONS AND CONCLUSION

4.1: Summary of Findings

Analysis of the different activities and roles of women in agriculture reveals that even though there are differences in terms of gender roles in division of labour, there is always a mutual cooperation between the sexes in almost all the activities. Both men and women are bread earners and are working side by side and this is perhaps one of the reasons to equalize the status of women in the tribal segment of the society.

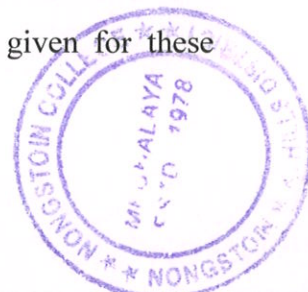
It can also be seen that there is also a dichotomy based on sex with regards to the participation of work in agriculture. Women are engaged in the tasks which need a sustained efforts and endurance and endurance while men are engaged in the task which needs a physical strength. In agriculture women are needed everywhere right from the broadcasting of seeds, weeding, arranging, harvesting and threshing, winnowing of paddy, collection and transportation of vegetables crops etc. Women are also involved in the marketing of their daily produce.

In contrary to the common notion that men are the only bread winner of the family, analysis in the previous chapter reveals that women also plays a crucial and equally equitable role in income generation, food production as well as shares responsibility in term of decision making of the family which are inherent characteristic of a matrilineal society.

It can also be seen that there is a short fall of participation of women in agricultural production and this is due to the diversion of women from agriculture to other activities.

4.2: Suggestions

1. This sector requires further exploration because most of the income derived from this work frequently provides the very basis for family survival particularly among the extremely poor farmers.
2. Precise data collection is required especially for women engaged in home based production which in turn can be analyzed in a meaningful way for the benefit and economic uplift of the district in general and the tribal societies in particular.
3. Women play a major role in agriculture though as invisible worker. Thus there is a need for re-define the concept of 'worker' and monetary status should be given for these activities.



4. Education programs on such areas of home based farms and home based production should be incorporated in rural development programs so as to benefit the women workers. Time saving technologies and strategy should be made available for the women to enable them to manage between different activities at ease and at their convenience. Access to skill acquisition, skill training and skill up gradation will play dominant role in uplifting the rural economy of the village. Further, a growing realization of the need for a comprehensive process of development should also encompass women at the core of development programmes.

4.3: Conclusion

Thus, the people of Meghalaya believe in traditional agricultural system. The shifting cultivation is practiced since time immemorial. However, terrace (bun) agriculture was started three decades ago. The farmers predominantly use these two systems, more popularity to shifting cultivation. Slash and burn forest tress and to raise crops on ash rich soil for few years is the basis of shifting cultivation. Whilst, bun agriculture is done on terraces, ear heads of crops are taken and other parts of plant are left on cultivated land. The traditional agricultural systems help in improving soil fertility through decomposition of plant material left on soil. Farmers prefer the bamboo drip irrigation system because of its feasibility and no loss of water on the way. The villagers also grow crop plants in association with trees. The harvesting of crops is done by using different kinds of sickle made for the purpose. After harvesting, the food grains are stored in different kinds of structure traditionally made by the farmers using soil and plant materials. The materials from selective plant species are used to make these structures. Seeds are stored safely without any chemical. Thus, the seed storage structures are economic, environment-friendly and resistant to pests.



REFERENCE

- *Amali, E, 1989. The role of women in agricultural development process. Develop, studies Reverse 2:52-60
- *Census of India; 2011
- *Chottopadhyay Manabendu (1982), "Rule of female Labour in Indian Agriculture" Social Scientist.
- *Data, Parul. 1976: "women in Arunachal and their status in the socio-cultural life" Resurun, Govt. of AP, Shillong.
- *Hutton, J.H. 1922: "The Sema Nayas" Mac.Millan London.
- *Inventory of Agriculture 2015, WEST KHASI HILLS DISTRICT, ICAR.
- *Mahajan, V.S. 1984: Changing role of women in rural economy in Assam:- Women contribution to India's economic and social development.
- *Jain, D. and Chand, M. 1982: Report on time allocation studies; its methodological implications, paper presented at technical seminar on women world and development, New Delhi.
- *Nengnong, D.D. 2011: "Women and work; A study in women's work in villages of Ri-Bhoi district of Meghalaya."
- *Parry, N.E. 1993: "The Lakhers" Firma KLM pvt.Ltd. Tribal institute, Aizawl.
- *Saito, K, A and D Spurling, 1992. Developing agriculture extension for women farmer. Washington DC world Bank Discussion paper 156
- *Sivyard, R. 1985: Women a world report, Methuen London Ltd pp.56-57.
- *Sivyard, R. 1985: Women a world report, Methuen London Ltd pp.56-57.
- *Singh Bhagwan, pd, and Singh, Seema, Planning and plight of female Rural labour Market in India, in Alakh. Sharma and Seema Singh (ed) women and work changing scenario in India B.R. Publishing Corporation, New Delhi, 1993
- *Thorton P.K, kurska RL, Henninger N, kristjaanson P.M Reid R.S, Altino F Odero A.N and Ndegwa T. 2002, rapping poverty and livestock in developing World [RL](Inter-nationallivestock research Institute), Nairobi, kenya, 124 pp.



Appendix-I

HOUSEHOLD SCHEDULE

1. Respondents Name Date of survey

2.

Name of the village	Block	Subdivision

3. Location of the village

High land	lowland	Inunduation (not/occasional/annual)

4. Demographic and Social Structures

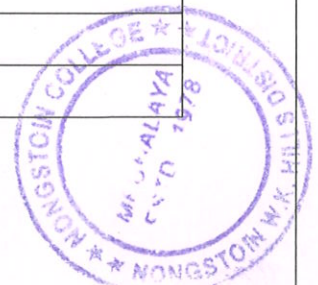
Sl .NO	Relation to the head of the family	Age	Educational status	Marital status	Family Type\size	Occupation

5.Occupational structure

Sl N o	Type of work	Number of days					No. Of workers				
		1	2	3	4	5	1	2	3	4	5
	Family No										
1	Cultivators										
2	Wage laboures										
3	Petty traders										
4	lumbering										
5	Salaried(govt&pvt)										
6	Others										

6. Decision making behaviour of sample household in farming activities in irrigated

Activity	Male	Female
Crop selection		
Seed treatment		
Fertilizer selection		
Sale of produce		
Storage of grain		
Care of animals		



Farm Investment		
Purchasing of land		
Hiring of labour		
Crop selection		

7. Division of labour (with time devoted)

Activity	Performed by men only		Performed by female only	
	Ravi	Kharif	Ravi	Kharif
Ploughing				
Field preparation				
Seeding				
Transplanting				
Weeding				
Harvesting				
Carrying harvested crop				
Thrashing				
Husking				
Preparation of food				
Livestock maintenance				
Kitchen gardening				
Horticulture				

8. Reasons for taking up agricultural activities.

Support family		Economic reason (income)		Tradition		Any other	
Nos.	%	Nos.	%	Nos.	%	Nos.	%

9. Animal husbandry and livestock rearing

Types	household	Owned*					Earnings/year**				
Cattle											
Pigs											
Poultry											
Fishery											
Bee keeping											



FIELD SURVEY AT PYDENGREI VILLAGE

