

Traditional farming system of Garo tribe in Netrokona district of Bangladesh

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Abstract: This article explores the indigenous knowledge of traditional farming system of Garos on plain land, homestead and forestland with the objective of assessing its role in conserving the natural resources. For this purpose an exploratory study was conducted in two villages namely Fulbari and Nollapara inhabited by both local people and Garo tribe. Primary informations were collected through households interview by a semi-structured questionnaire. A total of 40 Garo households out of 100 were interviewed. Average family size of Garo tribe in the study area was 6.5. Overall, 53% of the total population was male and the remaining was female. In practicing traditional farming and regulating other livelihood activities the Garo tribe had developed indigenous knowledge of their own which was transmitted from generation to generation. We found that Garo tribe applied their indigenous knowledge on plain land and homestead management. They mainly adopted Agroforestry farming technique for their early income and livelihoods. In case of forestland management they share their knowledge with forest department through participatory management. Considering the present findings it is concluded that the indigenous knowledge of Garo tribes is helpful for the conservation of natural resources. However, government and non-governmental supports were needed for the improvement of their indigenous knowledges.

Keywords: Indigenous knowledge, farming system, agroforestry, Garo tribe.

INTRODUCTION

Traditional knowledge and life style of the indigenous people have close link with nature. Traditional knowledge is also a fundamental component of natural resource management. Indigenous communities care much about their surrounding environment and employ a variety of systems and practices to deal with land resources, wild life plants and water etc. (Ovedeo, 2000). The Garo tribe have an ethnic identity are no exception.

The latest record of ethnic groups in Bangladesh gives the number as 27 distributed in the various regions of Bangladesh (BBS, 1992). However, according to Khaleque (1995) the number of ethnic groups was 21. Garo is one of them. Khan (1998) reported that there are 64280

Garo tribal peoples lived in the northern part of Dhaka division. Garos are concentrated mainly in Tangail, Mymensingh, Netrokona and Jamalpur district. In Bangladesh, they call themselves *Mandi* (Which means human being) and in the Garo hills people use the name *Achick* (Hill person) (Burling, 1997).

The need for indigenous knowledge research is emerging with the participatory movement (De Walt, 1994; Sillitoe, 1998). We define indigenous knowledge as traditional knowledge used by the local people for natural resource management relating to agriculture, fisheries, livestock, health practices and other activities. According to Khan *et. al.* (2000) indigenous knowledge is the local knowledge unique to a society, community or culture. Garos

have their own traditional knowledge to manage natural resources for their livelihoods. The main livelihood activities of Garos are agricultural practices in the plain land, homestead and in the forestland. They follow plough cultivation in plain land for transplanting rice. But they managed their homesteads and forest land as agroforestry system namely agrosilvipastoral system and agrisilvicultural system respectively.

Garos managed their plain land and homestead since time immemorial. But they managed the forestland from 1990 associated with forest department of Bangladesh. They cultivate rice in the plain land and different vegetable, spices, timber, livestock in their home garden. Except salt and oil they produced most of their daily necessities. They collected fodder, fuelwood, timber, medicinal drugs, and agricultural implements from the forest (Dwivedi, 1993).

The study was conducted in Fulbari and Nollapara villages within the Durgapur upazila of Netrakona district. Till now, no extensive study has been carried out to document the traditional farming system of Garos. We explored the techniques of traditional farming system of Garo tribe. The purpose of this study is to provide insights of the indigenous knowledge of Garos practiced on plain land, homestead and forest land management that would be useful to the agricultural department, relevant non-government organization, and forest department in the efforts to support their livelihoods.

Material and Methods:

The study was conducted in Durgapur upazila (sub-district) of Netrokona district, Bangladesh.

Durgapur upazila located in the northern region of Netrakona district with an area of 293.42 sq km. It is bounded by Meghalaya (State of India) on the north, Netrakona Sadar and Purbadhala upazilas on the south, Kalmakanda upazila on the east, Dhobaura upazila on the west. Geologically the area is almost uniform (Rashid, 1991). Topographically the area is characterized by its large hillock, known as tilla. The drainage pattern of the area is dendritic (Hossain and Hauque, 1977). The soil pattern of the Durgapur is complex. Most of the upland has deep, moderately well drained permeable clay to heavy clay in the valleys. Some of the upland has impervious clayey sub soil. Soil pH varies from 6 to 6.5 (Rashid, 1991).

We purposively selected Durgapur upazila of Netrakona district as maximum number of Garo tribe lived in this upazila. We collected the list of Garo villages from Durgapur upazila statistics office. There were five villages in where Garos are dominant. Two villages namely Fulbari and Nollapara were selected randomly. We found 100 Garo households in these two villages. A total of 40 households were selected randomly for interviewing. Sampling intensity was 40%. Data were collected both by the interview and from direct observation during a long period of nine months from October'05 to June'06. We used a semi structured questionnaire for households interviewing focusing on the traditional farming system. On each topic the respondents were free to express his/her views.

Results and Discussion

We revealed the total number of Garo households in our study site was 100. Family sizes were

comparatively big ranging from 4 to 11 people as most of the families were combined. Average household size was 6.5. Fifty three percent of the total population was male and the remaining was female. The literacy rate of the Garo was

satisfactory. We found the literacy rate 74%. Among them highest percentage was in primary level (45%) followed by secondary (17%) and higher secondary (12%) (Fig 1).

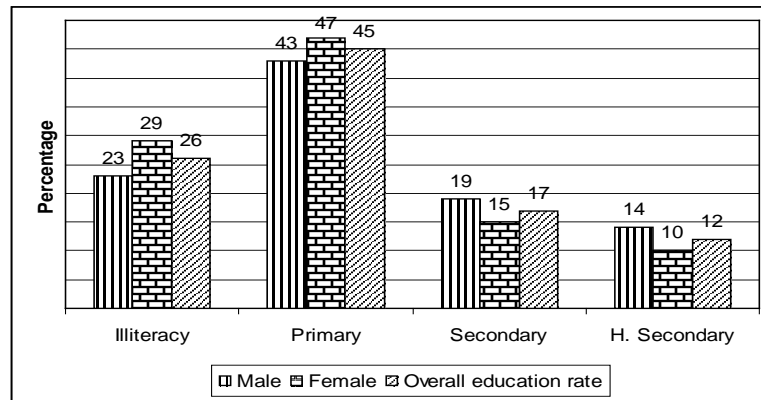


Figure 1: Households education status.

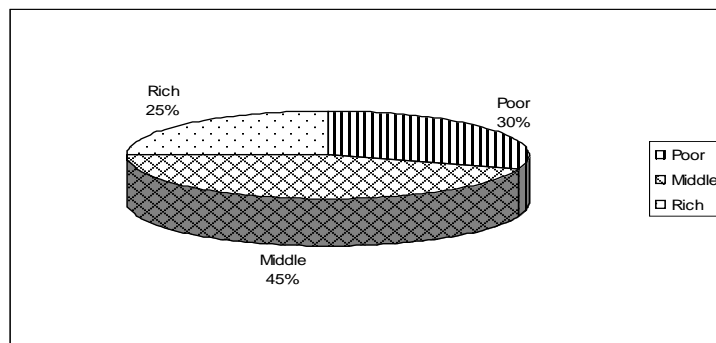


Figure 2: Economic status of the households

Most of the households in our study site are poor to middle class. We divided Garo households into three categories namely poor, middle, and rich according to their income. Asking their monthly income from different sources we categorized them into poor (monthly income range <Tk.5000, middle Tk.5000-10000 and rich Tk.10000+). We found that overall 30% households were poor. Overall 45% and 25% of households were fall

under middle and rich category respectively (Fig. 2). Household interviews indicated that for most people, monthly expenditures exceeded their income.

Traditional farming system

There are three types of farming system found in the study area practiced by Garo community namely plain land agricultural cultivation, homestead Agroforestry, and participatory Agroforestry.

The former two are associated with their own knowledge and activities and later is associated with forest department of Bangladesh.

Plain land Agriculture

Topographically the area is characterized by the large plane tract except some tillas. The plain land is generally used for rain fed crop e.g. *Aman* and *Aus* rice. Sometime the gentle slope between the tillas is used for growing maize, groundnut, mustard by applying minimum tillage. Slopes around the tilla land are protected by raising hedges which also reduce the velocity of the water reaching the plain land. All land in the study area is suitable for paddy cultivation. But flood free area is suitable for high yielding rice cultivation in monsoon.

Procedure of growing seedling

The place where light and air is available and free from floodwater is suitable for nursery bed. The land is prepared for nursery bed by ploughing, watering and laddering and made it very soft and muddy. The total area is fragmented into several unit plots, which are 125cm × 1000cm. In between the two units 50cm wide and 20 cm deep drain is prepared for draining, watering, and taking care of seedling. Seeds are poured loosely into the sack and remain it for 3-4 days by covering it with straw. After 3-4 days new shoots come out from seeds. These seed

are broadcasted on the nursery bed. Proper watering is done in the seedbed. The drain is filled with water. After 6-7 days interval they dragged the seedbed for 2-3 days.

Pricking and planting of seedling

The seedbed is wetted about 10-12 hours before pricking the seedling. This is done in such a way that there would no damage in roots and shoots. Seedlings are sowed in line about 25cm spacing from row to row and 15cm spacing about seedling to seedling.

Cultural practices

For *Boro* cultivation, they kept the land weed free at least for 40-45 days. Weeding is done by rotary weeder. On an average, 120 cm water is applied for the lifetime of the *Boro* rice cultivation. If there is any shortage of water, production will be low and even damages the crops. To obtain maximum production equal water level irrigation is done by proper leveling of the land. The rate of the fertilizer depends on the fertility of the land, season and the type of rice. To improve the effectiveness and utility of the fertilizer the following rules are followed by Garo households-

- All dissolve fertilizer are broadcasted before ploughing and laddering the land
- If the land is infertile, 30% urea fertilizer is broadcast in 7-10 days

after planting the seedling.

- If the crop is used for seed, the amount of the fertilizer is reduced into about 20%.
- In acidic soil, Murate of Potash is broadcasted.

For *Boro* rice cultivation in haor or low land, Urea (135kg), TSP (200kg), Potash (70kg), Zypsum (60kg) and Zinc Sulphate (10kg) is used per hectors. About 175 harmful insects are found in paddy field among them 20-30 species are seriously harmful and 15 species are found all the year round. About 13% *Boro* crops are destroyed by the insects attack. Sometimes insecticides are applied for the removal of the pests and insects.

Harvesting

Paddy is harvested when 80% are ripped. Then rice is collected from the rice strict. The green straw is not dried in the sun immediately. It is stored in a heap for 5-6 days to increase chemical content and food value in it. Rice is dried in the sun and kept in the storeroom. The production rate of *Boro* rice yield is 6 tons per hector.

Homestead Agroforestry

Home garden farming system is an ancient and widespread agroforestry system. Garo tribe follows agrosilvipastoral system in their homesteads. There are three main components of this system namely trees, crops and livestock.

Field Preparation

Land preparation for tree species is very similar to the establishment of forest tree plantation (viz. spot clearing- staking-hole digging). But for crops the preparation is more thorough and involves tillage operations. In general the purpose of field preparation is to provide a proper biophysical environment for the crops.

Planting materials

Garo use seed, seedling and vegetative propagules to generate the plant in their home garden. They broadcast or put the seeds in a certain place and watering. After germination watering continued and keeps it free from goat and other cattle. Sometimes they throw the seeds after consuming the fruits. Some trees are grown from vegetative propagules for budding grafting and cutting. Sometimes they collect vegetative propagules which produced from root viz. Teak, Sal, Taro and banana etc.

Sources of planting materials

Food and fruits producing species are mostly originated from seed which is collected from their home garden. Sometimes they collect improved variety of fruits from their neighbors. After consuming the fruits they sow the seeds. In case of exotics and timber producing species they use seedling which are collected from market.

Planting pattern

Most of the Garo were found to

follow traditional planting pattern. They always make their house south facing in order to ensure maximum sunlight and wind. They also do it in order to keep their rooms free from water from the *Kal baishaki* storm, which always comes from North West direction. Fruit trees are always planted near the house. Timber species are planted usually away from their home especially in the northwest side of home to protect their living houses. Most of the Garo houses have two-entrance road, which are planted with *Supari*. Vegetables (climbing) were planted usually east and south side of their house.

Cultural practices

Garo households practices different cultural operation in their homesteads. They follow weeding operation in time when they had no agricultural works in the field. Their family members do weeding operation. Weeds are used as mulch if they are herb and not used as fodder. If it is fodder species, the weeds are collected for their cattle. In case of vegetable if any insect attack occurs they use ash to prevent those. Most of them use cow dung and ash as manure, no chemical fertilizer was reported to use.

Harvesting

The timing of harvesting agricultural crops could spell the difference between success and failure. Most horticultural crops are harvested by priming i.e. harvesting the

crops at its peak physiological maturity. To be sure about the maturity of trees, the farmers observed by striking them with the back of the *dao*. When they heard somewhat metallic sounds, they confirmed about the maturity of the plants. It was reported that they harvested the tree species during the winter season. Sattar (1998) assed the scientific basis of the reason that trees has lesser chance of attach by the fungus and insects during winter season due to low temperature and humidity.

Participatory Forestry

The territory of the Durgapur tract is almost plain but there are some tillas in the boarder line areas. The tillas are under the protection of the forest department. Most of the land property of the forest department is used as participatory agroforestry that is called woodlot plantation by the Garos. This woodlot plantation was started in 1990 and still it is going on successfully. Local forest department, settlers and the Garo are the key component of this program. The land which was occupied by the encroachers and on which agricultural crops are practiced is mainly selected for the woodlot plantation. Total area of woodlot plantation is 100 hectares and total number of the participants is 100. Every Garo participant gets one hectares land year to year as a renewable basis. Garo participant follows the agrisilvicultural system in this forest land.

There are two components namely tree and crops in this agroforestry system. They plant different types of tree and crops species in confined land. Most common medicinal and horticultural species are Neem, Bohera and pineapple papaya respectively. They get whole benefit from the medicinal and horticultural species. Few years ago this area was full of forest trees.

Terms of participation in participatory Forestry

The local landless and small farmers living in and around the project area and encroacher were selected as participants. In case of Garo tribe poor, landless, and Garo households adjacent to the project area were selected as participants. Participatory Agroforestry approach is a continuous process. Both forest department and participants follow some terms and conditions. These are as follows-

- Each participant is granted usufruct right over 1 hectares forest land on a year to year renewable basis.
- Agricultural inputs in Agroforestry model viz. forest tree seedling, crop seeds, fruits seedling, fertilizer, insecticides given free of cost to the participant by the forest department.
- If any participant fails to satisfy the conditions set by the forest department, forest department holds the right to nullify the contract at any

stage of contract tenure.

- Farmers are given right to enjoy the entire output from the agriproducts
- All intermediate returns from dead trees branches pruning, thinning, and up rooting are being enjoyed by the participants.

Sharing agreement

The plantation established on participatory basis are being harvested at the end of rotation and the sale proceeds are distributed on the basis of benefit sharing agreement approved by the Apex Body as follows:

- Forest department - 50%
- Beneficiaries - 40%
- Tree farming fund (TFF) - 10%

The sharing agreement is documental and it is delivered to all participants. TFF is kept to a committee and spend to establish and maintain new plantation. The participants get several technical supports from forest department. Proper training on how to plant and maintain the plantation is given to them by the forest department. Planting materials such as fertilizer, stick, strings are also provided to them. The forest department does protection from pest, disease and mortality and vacancy filling.

Conclusion

The indigenous people living in the upland

area of our country depends on available local natural resources to meet their needs in respect to their agricultural production, cattle rearing, food and medicine. They are the natural protector of our forest. By adopting Agroforestry and participatory forestry program, the hilly people again prove their willingness to save the forest in the study area. Though they are managing their farms well by their indigenous knowledge and management techniques, but there is no modern farming technology and broad credit facilities. They are also facing a lot of problems during cultivation, agroforestry and participation in joint forest management. So, it is needed to solve their problems and provide more credit facilities by government and non-government organizations. Modern suitable technology on agroforestry should introduce to them and motivate them to adopt it, which ultimately increase their income, uplift lifestyle and samely reduce their dependency on forest for their livelihoods that save the forest. Further research is strongly encouraged in this regard for other villages dominated by Garo tribe.

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