

**“LAND HOLDING, LAND OWNERSHIP AND CUSTOMARY LAW GOVERNING
LAND FRAGMENTATION IN ZIRO VALLEY, ARUNACHAL PRADESH”**

Prof. Santanu K Patnaik
santanu.patnaik@rgu.ac.in
Professor and Head of Department,
Rajiv Gandhi University, Doimukh,
Papum Pare, Arunachal Pradesh

ABSTRACT:

Ziro Valley of Arunachal Pradesh is known for its pisciculture cum agriculture and its heritage value. Topographically it is a gentle saucer shaped valley with outlet of river Kele forming the end point of the Valley. It is inhabited by Apatani tribe indigenous people with a long tradition of Fish-cum-Paddy farming spreading about 32km². A field survey was conducted for five villages at household level to understand the landholding and size of land. The crop fields were individually mapped from Google earth to corroborate with the survey data. It is found that there are 5 landless families, 50 marginal, 42 small and 2 each in semi medium and medium landholding category with in 101 sample households. This implies that the crop fields are small. When 859 contiguous crop fields mapped from satellite images surrounding Hari Village was mapped it was found that the crop fields are small with less than 0.5 hectare size constituting 91.5 percent of total crop fields. The scenario is aggravated as per inheritance system among Apatani customary law. In Apatani society land is seen as individual prestige and wealth so sale of land is extremely rare. However in contemporary time purchase of land is also observed; i.e. those who can afford (Govt. job holder) can also purchase land adding to increased land holding.

Key word: Ziro Valley, Land Holding, Customary Law, Crop field size, Land fragmentation

INTRODUCTION

Ziro valley, the land of Apatani also known as ‘Rice Bowl’ of Arunachal Pradesh, is located at an altitude of 1572 meters above the mean sea level in the district of Lower Subansiri. The Ziro valley has an area of 1058 km² of which 32 km² under agriculture and remaining under forests, plantations and settlements. Agroclimatically it is best suited for paddy crop during summer with adequate rainfall and standing water management system by the natives. They grow 16 varieties of rice in the waterlogged paddy fields by means of organic farming (Kala, C. P. et.al, 2008). It is so popular that Rethy, P et.al (2000) recommended for encouragement through use of high yielding varieties of paddy and fish and at the same time preserving the local varieties for biodiversity conservation and future breeding programmes. There is a strong sense of soil and water conservation practices through indigenous technologies and agronomic yield is five times as high as state (Dollo, M. et.al. 2009). Economically there is an immense scope for development of fish farming (Nath,

K. 2015) but fish farmers are not getting desired fish production in their pond due to lack of good quality of fish seed and fish feed. Production level and success of paddy-fish farming in the area can be used as incentive and the same may be considered as model for different ethnic groups in Arunachal Pradesh for sustainable mountain agriculture and rural economy (Saikia, S. K., et.al. 2008, Sarma, A., et.al. 2016). Das, D N (2002) has stated that there is scope for cultivation through rice-fish culture for about 2650 hectares in Arunachal Pradesh. All these point to one important fact that the paddy-fish combo has social, economic, cultural and ecological relevance. A holistic study was initiated by P. S. Ramakrishnan (1992) on agro-ecosystem and village ecosystem function; succession patterns and processes; and Management implications on shifting cultivation as well as agricultural system of Ziro Valley.

The area is inhabited by natives known as Apatani. Literally, the word Apatani is composed of two words – ‘Apa’ and ‘Tani’, according to the local language, ‘Apa’ means display of affection and ‘Tani’ stands for human race. The Apatani, generally speak in their own dialect which has no scripts. Traditionally, they are settled in seven villages namely, Hong, Hari, Bulla, Dutta, Hija, Mudang-Tage, and Bamin-Michi. They belong to the Tibeto-Mongoloid stock and trace their descent from one legendary ancestor, the Abotani. In the District of Lower Subansiri, Ziro (Sadar) there are a total of 4835 household with a population of 22747; Old Ziro has 3274 households and population of 19605 and the town has 3004 households with a population of 12806 as of 2011. These three areas constitute Ziro Valley area.

Land occupies an important position in the life of agrarian community and indigenous tribal communities of Arunachal Pradesh follow a similar practice. In every tribe of Arunachal Pradesh, household position and influence over the society depends largely upon the size of land one holds. This aspect is not an exception to the Apatani, for “the influence and social prestige of an Apatani depend largely on the size of his holding. Among the Apatani, land is the main source of individual wealth and all other and less permanent possessions are mainly valued as means of obtaining more land” (Haimendorf, 1962: 16). Land ownership among Apatani covers several types of land viz. gardens like kitchen garden (Balu) located near to the village or farther away from the village, bamboo garden (Bije) located near the village, woodland (Saadi) located far away from the village and wet rice field (Aji) either located near or far away from the village. They have successfully demonstrated paddy cum fish cultivation in the single cropping system in the valley with a unique water resource management system.

Ziro Valley has a great aesthetic and scenic value. UNESCO has proposed the Ziro (Apatani) valley for inclusion as a World Heritage Site for its "extremely high productivity" and "unique" way of preserving the ecology. The first round of international visitors is Europeans in 1897, when British officials stayed in the valley for two days. Thereafter, six similar brief visits later took place between the 1920s and 1930s. Even studies have been carried out to find out potentiality of destination branding through bio-tourism for the Ziro Valley (Choudhury, S. et.al. 2016).

Even if there are estimates and projection for expansion of paddy cum pisciculture; branding the area as tourist hotspot, land resource is limited and precious and the same has been under optimum use; leaving little scope for alteration. Another imminent dimension of pressure on land is due to pressure for horizontal expansion of area under homesteads due to increase in number nuclear families; scarce land resource for cultivation is succumbing to land use change.

STUDY AREA

The study area is located in Ziro-I circle, Lower Subansiri district of Arunachal Pradesh. It lies in the north western outer side of Ziro Township. It lies at an altitude of 1572 meter with picturesque surroundings. Extent of area is between 27°32' to 27°37' N latitude and between 93°48' to 93°52' E longitude. The valley is situated at the central part of Arunachal Pradesh (Figure 1).

Extensive development of igneous and granite rocks are seen on the Ziro Valley. The Ziro valley shows some grey clay sands and thin pear beds which are most likely of the Pleistocene epoch. The sub-Himalayan climate with moderate sunshine and rainfall and strong winter makes the valley a paradise of tall trees and foliage. The land and climate conditions are favourable for cultivation of paddy.

The entire region of Apatani valley falls within the heavy rain zone. The Monsoon starts from the month of March/April and continues till the month of September. The annual rainfall fluctuates from 2240-2910 mm with the maximum rainfall during the month of June and July. The minimum and maximum temperature during summer is 6.3°C and 28.1°C respectively and that of winter is 1.0°C and 18.4°C respectively. Thus, it is characterized by cold, humid, high altitude type of climate, where relative humidity remains constant between 70 – 80%.

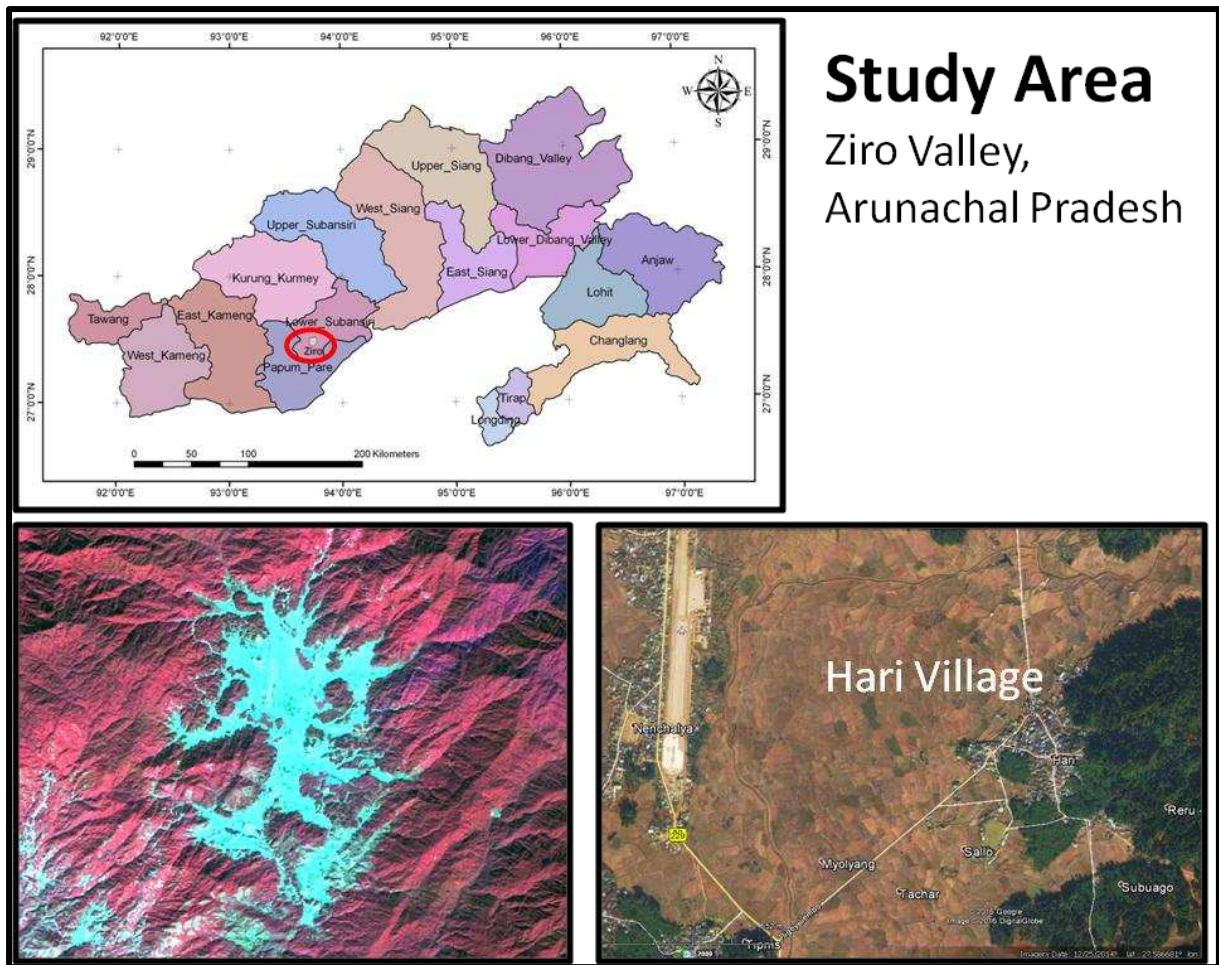


Figure 1 Location Map

The land in the vicinity of the village is cultivated for paddy and millet and area not suitable for cultivation is used for bamboo and pine and other valuable woods. The housing and granary sites are located on the higher level than the crop fields so that decayed and decomposed substances can be easily drained out to field to enhance fertility.

HOUSEHOLD SIZE

The size of households of any area depicts many pertinent aspects of the demographic characteristics. It indicates the number of persons living and dining under same roof. The average household or family size is calculated by dividing the total population by numbers of households. In native tribal society of Arunachal Pradesh family lives in nuclear family as per tradition. Family is generally large and considered to be normal as there is lack population control measures and strong need of working hands. In 1961 average household size was 5.61 in the then large Subansiri district (Barthakur, I. K., 1973).

A household survey was recently conducted in the study area for one hundred and one (101) households. Population of the surveyed households was five hundred ninety three (593) that amounts to average household size of 5.87 members (Table 1). In the Ziro valley large family size has an advantage because in the agricultural operation, more hands are required especially in the time of plantation and harvesting. This shows that the population pressure on the wet rice cultivated (WRC) has increased due to growth in population.

Table 1: Average household size of the study area

Village name	Total population	House	Average household size
Hari	159	24	6.63
Dutta	148	25	5.92
Mudang-Tage	103	18	5.72
Hija	78	14	5.57
Old Ziro	105	20	5.25
All	593	101	5.87

OCCUPATIONAL STRUCTURE:

In the Himalayan region population density is low and avenues for occupation are limited. Rural population in the mountain areas of Arunachal Pradesh practice nomadic farming known as shifting cultivation on less nutrient rich slopes by burning existing vegetation roughly with a 6-10 year cycle. Study by S C Rai (2005) is an insight to the self sufficiency in an agricultural society that practices sound sedentary agriculture. The majority of population in the mountainous region depend upon agricultural and forest based natural resources for their livelihood (Ramakrishnan, 1997). The traditional farming system is an age old tested mixture of crop, forestry and animal husbandry (Ramakrishnan, 1993; Dollo et al., 2006). Recently with the awareness of knowhow horticulture has become popular (Dollo and Sundriyal, 2003). The inhabitants in the area mostly practice wet rice cultivation as per tradition along with pisciculture. They grow various crops like rice, maize and millets. They also grow vegetables, chillies, potatoes, pumpkins, kiwi, pears, plum etc, in nearby gardens of the houses.

With growth of administrative machinery, educational institutions, healthcare facilities, consumer goods and service sector there has been substantial change in the occupational pattern in Ziro Valley area. About 10.63% of people are engaged in business like shops, contracts etc. females runs most of the shops in the villages and augmenting their family income. The working percentage of female in the business is 18.03%. Where business like contracts, timbers and other works are dominated by males, occupy only 5% in the

business. And the last category includes politicians, retired persons, village headman etc. which makes 9.92% of the total population, of which 13.75% are males and only 4.91% are females.

The occupational structure as surveyed from the households of these villages can be understood from Table 2. This is important to understand the dynamics of change in land ownership.

Table 2: Occupational structure of the study area

Sl. No.	Occupation	Population			% of Total working population		
		Male	Female	Total	Male	Female	% Total
1	Business	4	11	15	5.00	18.04	10.63
2	Farmer	19	35	54	23.75	57.37	38.30
3	Govt. Job	46	12	58	57.50	19.67	41.14
4	Others	11	3	14	13.75	4.92	9.93
	Total	80	61	141	100.00	100.00	100.00

LANDHOLDING

The term landholding generally refers to the amount of land under land-title by a person. In Apatani tribe one's prestige and influence over the society depends largely upon the size of the land one holds. Among the Apatani, land is the main source of individual wealth and all other and less permanent possessions are mainly valued as means of obtaining more land.

In traditional society there was no standard unit of measurement of land. All types of lands are measured in terms of yield or extracting capacity. In case of agricultural land yielding capacity of crops are considered. While in case of pine and bamboo fields, number of plants or grove are considered. Moreover the area has no cadastral survey and no numerical data are available on land holding pattern of the past. It is, therefore, difficult to get a clear picture of the nature of landholding by each household. However, an idea about individuals land holding can be reflected from the given Table 3. As estimated by Barthakur, I. K. (1973) on the basis of 1961 Census data Subansiri District had total households 9837; out of it 4245 households had WRC/TRC (Wet Rice or Terrace Rice Cultivation). That amounts to 43.1 percent of population; rest might be floating population from other states for various purposes. He also calculated that the average household land holding size 2.42 acre (on the basis of 1961 Census Series XXIV N35FA Part-II-A Page - 105 – 108)

The sample survey carried out for the indigenous people reveals that out of one hundred and one (101) surveyed households only ninety six (96) households have their own land rest five (5) households do not have their own crop fields. The landless households are surviving by selling rice beer and living a very simple life. There is no landholder under large land holding size. It is because in the Ziro valley the flat lands are very less which is suitable

for wet rice cultivation. As the households are many in comparison to land available, the percentages of marginal and small size landholders are more in comparison to other three.

Table 3: Land holding in five villages (As per NSSO Land holding Classification, 1992)

Sl.no	Landholding	(hectare)	Hari	Dutta	Mudang-Tage	Hija	Old Ziro	Total	% of total landholding
1	Marginal	< 1	10	11	12	6	11	50	52.08
2	Small	1 – 2	11	14	6	7	4	42	43.76
3	Semi-medium	2 – 4	1	0	0	1	0	2	2.08
4	Medium	4–10	2	0	0	0	0	2	2.08
5	Large	>10	0	0	0	0	0	0	0.00

The survey also reveals that variation in occupation has led to the variation in their landholdings. Table 4 shows that most of the people who are engaged in government service hold maximum number of crop fields, 16 households have marginal land and 28 households have small landholding. Among agricultural occupation households 14 are marginal, 3 are small and 2 are semi-medium landholding. Among households headed by female after the death of her husband, five are landless and are engaged in small business; 11 households have marginal landholding, 3 households have small landholding, owned as ancestral property or newly acquired land before the death of the male head. Six households who are engaged in business belong to marginal (4) and small (2) landholding class. Others who are engaged in politics, priest, Village Head and retired person have similar number of lands ranging from 1 to 4, which are of marginal and small. Thus this categorization highlights that occupation is mainly responsible for the amount of landholding by a man.

Table 4: Landholding among various occupation groups

Head of the Family	Landless	Marginal	Small	Semi-medium	Medium	Grand total	Percentage
Business		4	2			6	5.94
Farmer		14	3	2		19	18.81
Village Head			1			1	0.99
Govt. Job		16	28		2	46	45.54
Politician		2	2			4	3.96
Priest		2	1			3	2.97
Retired		1	2			3	2.97
(blank)	5	11	3			19	18.81
Grand Total	5	50	42	2	2	101	100.00

CROP FIELD SIZE:

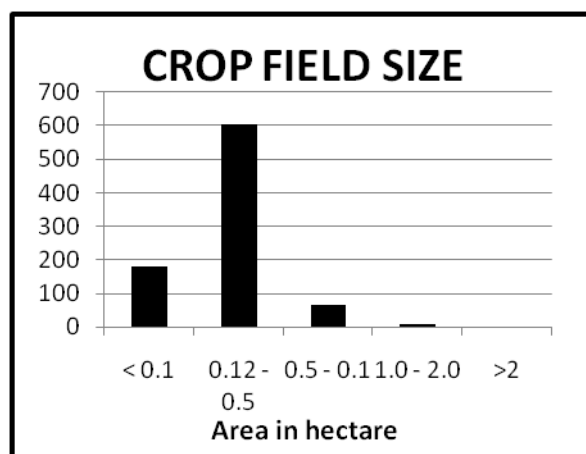
In Ziro valley the crop field sizes varies from 0.1 – 2 hectares on an average. To find out the landholding and number of agricultural plots of individuals, primary survey has been conducted. One hundred and one individual households from five villages have been surveyed according to their availability for response. Land holding as reported by the respondents has been classified using NSSO classification. Fields plots of Hari village have been demarcated from the satellite image taken from Google Earth which provides high resolution data and each field is clearly identifiable (Figure 2). Field sizes have been correlated with the responses of the households.

Only Hari village has been taken for demarcation of crop fields, because it is naturally bounded by River ‘Kile’. The other four villages do not have any such natural or manmade boundary. It covers fairly large area to represent the whole valley.

From the digitized plots it is found that in the Hari village there are eight hundred fifty nine (859) agricultural plots, out of this 50% of the fields are smaller than 0.2 hectares which equals to fields smaller than a size of 45 meter by 45 meter (Table 5). And mean size of the crop field is 0.247 hectare that is equal to a square field of 49.7 meter dimension, which are comparatively small.

Table 5: Crop field size of Hari village

Area in hectares	No. of fields	Percentage
Below 0.1	180	20.95
0.12 – 0.5	606	70.55
0.5 – 0.1	65	7.57
1.0 – 2.0	7	0.81
Above 2	1	0.12
Total	859	100.00



Because of the small size of crop fields, mechanization is difficult. They prepare their fields by ploughing which needs high manual labour but in return gives less production. Because of fragmentation, the size of plots became so small that sometimes it is not possible

to cultivate on them. Improved technology is most important for the growth of agricultural output but due to the small size agricultural plot it cannot be adopted and the possibilities of increasing agricultural productivity will remain limited.

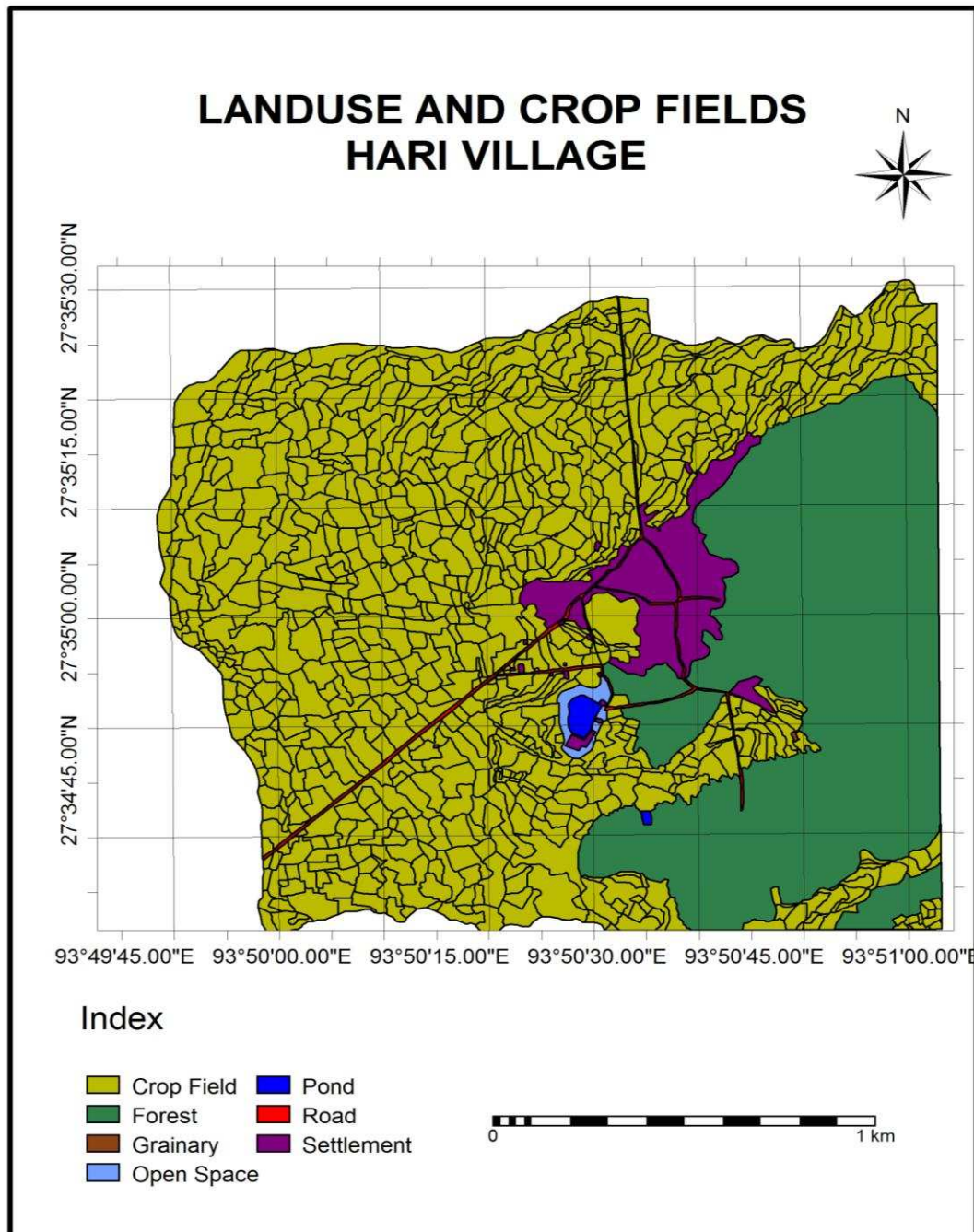


Figure 2 Crop field and Land use, Hari village, Ziro valley

FRAGMENTATION OF LAND:

Fragmentation refers to the division of land among heirs on the death of the owner of the land. With the passing of each generation the land get subdivided further and after some generation only tiny plots are left with the descendants of a large landowner. Each heir gets a

part of each individual field of the owner. Thus a person gets one tiny plot at one place, another tiny plot at a second place and so on. The causes of subdivision or fragmentation of holdings in Ziro Valley are enumerated below-

1. Inheritance system:

The inheritance system or the law (custom) of inheritance explains how landed and other properties are distributed, transferred, sub-divided and ownership entrusted among people from generations to generations in the society and the mechanism through which the system the system prevails. The inheritance system of landed property in the Apatani society can be viewed from two angles- inheritance of ancestral properties and inheritance of newly acquired properties. The Apatanis are patriarchal by nature and so father is the family head and owner of the landed property. The landed property is distributed among the sons accordingly to the sanctions of the custom. A son inherits the property of his father when he starts a separate household after marriage.

Apatani women cannot inherit immovable property though they contribute much to the household. They inherit a share of the tasang-tavine (beads and gem string) from their mother (Fernandes W, et.al.). But few cases show in contrary to the traditional customary law. In case, one marries two or more wives and gets sons from each wife his ancestral property will be given to the son of his first wife and newly acquired property go to the sons of his second wife. If there is no son for his first wife, the ancestral properties shall remain with her till she is alive. Thereafter, the properties are inherited by the sons of second wife. If one has no male issue, his landed properties are inherited by immediate sibling brothers who look after him in difficulties during his life time or may bear his death burden and will look after the deceased's wife after his death. The newly acquired properties, in such case, may be disposed off by the deceased's wife or may transfer to her daughters for these is no hard and fast rules that the non-ancestral properties too are to be inherited by immediate siblings. The inevitable consequence of these laws of inheritance is that farms get split up further and further with every passing generation. Because in Apatani society land is the main sources of individual prestige and wealth, so they need ancestral property to be inherited and these leads to the fragmentation of lands.

2. Pressure of population:

Growth of population has also added to pressure on land for various needs. Ziro valley has the highest density of population in Arunachal Pradesh and it is still growing

at a rapid rate. The traditional agricultural village has now become a town with various functions including administrative and service sectors. The floating population and temporary settlers in the area have added demand for houses for accommodation, trade and allied services. Thereby the crop lands close to settlement are gradually converted into dwelling units to be given on rent. This conversion of land has led to shrinkage of land for agriculture, thereby the landholding of farmers.

CONCLUSION:

The discussion indicates that how the land holding is important for the tribal communities of Ziro valley. Importance of land holding in Apatani society can be understood on the basis of how Apatani society values land in their societal function and echelon. They practice a unique kind of land ownership, the Apatani society is intimately linked with the social institution. The landholding size in Ziro Valley as per the house hold survey do substantiate that the landholdings are marginal and small in nature i.e. less than 1 hectare per household for 52 percent households and 1 - 2 hectare for another 44 percent households.

The pivot table derived using the data collected shows that the maximum concentration of land is with those who are in government jobs (45 percent), followed by farmers (19 percent). Out of total 19 households are headed by female five are landless and are engaged in business.

Crop fields are smaller as derived from satellite data due to absence of any land record. Average crop field size in the Valley is 0.247 hectares. Whereas 21 percent of crop fields are smaller than 0.1 hectare and 91.5 percent crop fields is less than 0.5 hectare. In the Ziro valley, flat land suitable for cultivation are very less and as the population has increased through time, it has led to fragmentation of cultivable land through inheritance and conversion of land for other purposes. This has also resulted in small sizes of crop fields in the valley.

REFERENCE:

1. Barthakur, I. K. (1973). The problems of agricultural development in Arunachal Pradesh with special reference to Subansiri district. Unpublished thesis, Department of Statistics, Gauhati University. <http://ir.inflibnet.ac.in:8080/jspui/handle/10603/66281> Accessed on 25.03.2017.
2. Choudhury, S., Pant, R. M., Chatterjee, S., & Nanding, A. (2016). Destination Branding of Ziro Through Potentiality of Bio-tourism. In *Bioprospecting of Indigenous Bioresources of North-East India* (pp. 329-337). Springer Singapore.

3. Das, D. N. (2002). Fish farming in rice environments of North Eastern India. *Aquaculture Asia*, 7(2), 43-47.
4. Dollo M, Sundriyal RC. (2003) Agricultural status and future potential in the State of Arunachal Pradesh, India. *Arunachal University Research Journal*, 6(2)21-33.
5. Dollo, M., Chaudhury, S., & Sundriyal, R. C. (2006). Traditional farming and land tenure systems in West Kameng district, Arunachal Pradesh. *Shifting agriculture and sustainable development of north-eastern India: Tradition in transition*. Oxford and IBH Publishing Co. Pvt. Ltd., New Delhi, 293-315.
6. Dollo, M., Samal, P. K., Sundriyal, R. C., & Kumar, K. (2009). Environmentally sustainable traditional natural resource management and conservation in Ziro Valley, Arunachal Himalaya, India. *Journal of American science*, 5(5), 41-52.
7. Fernandes W., M. Pereira, & V. Khatso () *Customary Laws in North East India : Impact on Women*. National commission for women New Delhi. Accessed on 25.03.2017. <http://new.nic.in/pdfreports/Customary%20Law.pdf>.
8. Kala, C. P., Dollo, M., Farooquee, N. A., & Choudhury, D. C. (2008). Land-Use Management and Wet-Rice Cultivation (Jebi Aji) by the Apatani People in Arunachal Pradesh, India: Traditional Knowledge and Practices. *Outlook on Agriculture*, 37(2), 125-129.
9. Nath, K. (2015). Production and market efficiency for inland fisheries in North East India: The empirical study of Lohit and Lower Subansiri districts of Arunachal Pradesh. *International Journal of Fisheries and Aquatic Studies*, 2(5): 39-45.
10. Rai, S. C. (2005). Apatani paddy-cum-fish cultivation: An indigenous hill farming system of North East India. *Indian Journal of Traditional Knowledge*. 4(1), pp. 65-71.
11. Ramakrishnan, P. S. (1992). *Shifting agriculture and sustainable development: an interdisciplinary study from north-eastern India*. Parthenon Publishing Group.
12. Ramakrishnan PS. (1993) *Shifting agriculture and sustainable development: An interdisciplinary study from North-Eastern India*. Oxford University Press, Delhi, pp 424.
13. Ramakrishnan, P. S. (1997). Scientific basis of traditional wet rice cultivation by North-East India hills tribes. *Trends in Agrarian Structure in the Hills of North East India*, Commonwealth Publishers, New Delhi, 233-247.
14. Rethy, P., Sood, K. K., Singh, B., Chakraborty, A., & Kago, D. (2000). Unique agri-piscicultural practice of Apatani tribe in Ziro valley of Arunachal Pradesh. *Journal of Ecobiology*, 12(3), 185-188.
15. Saikia, S. K., & Das, D. N. (2008). Rice-fish culture and its potential in rural development: A lesson from Apatani farmers, Arunachal Pradesh, India. *Journal of Agriculture & Rural Development*, 6(1), 125-131.
16. Sarma, A., & Goswami, D. C. (2016). Sustainable Management of Natural Resources- A Lesson from Apatanis. *International Journal of Scientific Research*, 4(5).