

## **The Appertains Cultural Landscape OF Zero Valley IN Arunachal Pradesh**

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### **I. INTRODUCTION**

As an ethnic tribe, Apatani is one of the advanced and unique community in terms of their cultural chord, possession of traditional wisdom, scientific tradition of agricultural operation, water management mechanism and other economic pursuit such as expertising in handicrafts and weaving and having traditional knowledge of sustainable management of forest for their daily economic and social activities in the midst of government policy on liberalization. As a staunch cognate race Apatanis have been succeeding their traditional clutch scrupulously as their basic ingredients of rich cultural heritage. The settlement areas and paddy fields are surrounded by blue rolling hills and mountains. The Ziro valley offers a spectacular example of co-existence of man and nature and how they have been perfected over the centuries. The existence of Apatanis was first recorded in the administrative report of 1882-83. Later H.M.Crowe mentioned them in 1889-90. But the term 'Apatani' was derived from the writings of Dr. Haimendorf in 1944-45. The enigmatic land comprises of about 32 Sq.km of cultivable areas out of 1058 Sq.km of Ziro valley, undulated by small hillocks at an elevation of 1525 Meter sea level (MSL) to mountain tracts ranging from 1830 to 2900 MSL. The blue pine and bamboo plantations are on the fringes of a wide mosaic of wet rice fields surrounded by thickly forested mountains on all sides form a picturesque landscape and offers splendid beauty. In the Ziro valley, the Apatani tribe inhabiting the valley and one of the major ethnic group of eastern Himalayas have distinct traditional land tenure practices and rich traditional ecological knowledge of natural resources management, conservation, nourish and nurtured over the centuries through informal experimentation. The Apatanis are known for their intricate handloom designs, expertise in cane and bamboo and unique characteristic of facial tattoo and nose plug of the Apatanis is on the wane now. This has made Ziro valley an elegant example of a living cultural landscape where man and environment has harmoniously existing together in a state of interdependency in the age of globalization.

The Ziro valley was initially a swampy wasteland inhabited by prehistoric reptile called *buru* (crocodile), the last of which was killed not so long ago by *myamya talo*- a kind of plate which exist even today. The story of *buru* had captured the imagination of adventurers around the world. Just before India attained independence, Lord Mountbatten dispatched an expedition to locate the *buru* under the ages of London Daily Mail, *buru* the reptile remained hidden in the mists of legends as elucidated in the book titled "The Hunt for *Buru*" by Ralph Lizzard. The development of the valley to the present status testifies to sheer hardwork and continued human struggle for survival against the infinite might of nature. The landscape development in the valley would be dated back to the time when the Apatanis are said to have settled down at Ziro. However, in the absence of any written record, the exact time is shrouded in amystery but oral history traces back to at least twenty generations after the tribe migrated from *Wi* and *Upyo supung* via *Mudo supung* to *Sulo supung*. They are said to have settled down in Talley valley for some time before shifting base to Ziro wet rice cultivation. As per the Apatani oral literature, it is believed to have been started from a place called *Pega-Saran*. Yari carried rice seeds from a mythological place called *Hinkun Lenbyan* met *Ato Pussang* and *Ayo Tane* at *Mudo Pyagang*. She presented a wide variety of rice seeds to *Ato Pussang* and *Ayo Tane* which is being cultivated even today.

As a living landscape, Ziro valley has proved capable of adapting itself with the requirements of changing times such as introduction of more economically viable cash crops like kiwi and cardamom with the help of traditional tools and techniques without use of chemical fertilizers in the cultivated areas. As a result of the sustainable management of natural resources in the valley, a study recorded 108 usefull indigenous plant species that are used variously in food, ethno medicine, handicraft, hunting and for cultural purposes. It is worth mentioning that traditional handloom designs of the Apatanis using organic dyes are recognized as masterpieces. The Apataniweave design called *Jilan* was released along with Varanasi brocade, Kanchipuram silk and Kalamkari weave of Andhra Pradesh in 2009.

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**Settlement pattern:** Apatanis settled in different villages, they are culturally homogenous, economically interdependent and they have strong social bondages through its family and marriage relations, festivals and friendships. Basically, the festivals and rituals like *Subu-Murung*, *Myoko*, etc. are carried out only in the traditional villages. This leads to the Apatanis to have a farmhouse individually at their respective traditional villages and nearby so that they could witness and easily participate in such festivals. With this the villages are thickly populated ranging from few hundreds to thousands. Typical traditional village houses are long in length and short in breadth. These houses are compact in nature. Each clan occupies a specified segment in most of the villages excepting in few cases where some clans are mixed because of the less population. However, from a wooden platform locally called *Lapang*, the name of the clan could be identified. The traditional village has its distinctive and uniform indigenous pattern of dwelling houses. The granaries of the villages are generally constructed in safe distance from the village main households, so that it is not easily caught fire at the time of fire accident. The Apatani society is patriarchal in nature. A rural nuclear family consisting of a couple and their unmarried children is considered as the social and economic unit. Generally, marriage is considered as a personal affair in which the parents and relatives do not interfere to a great extent with young people's choice of their partners (Haimendorf, 1962). They look upon marriage as a means to provide for a lifelong partnership of two congenial individual (Haimendorf, 1980).

**Table-1**  
**Population of Traditional Villages of the Apatanis-2011**

Village	Households	Population	Male	Female
Reru	259	1535	755	780
Kalung	108	792	389	403
Tajang/Lampia	224	1514	750	764
Hija	407	2347	1136	1211
Dutta	86	385	169	216
Mudang-Tage	228	1390	680	710
Bamin-Michi	93	592	285	307
Hong	401	2643	1283	1330
Hari	246	1531	730	801
<b>Total</b>	<b>2052</b>	<b>12699</b>	<b>6177</b>	<b>6522</b>

Source: Statistics Department, Lower Subansiri district, Ziro, A.P.

The Table-1 shows the traditional villages along with their population strength of the Ziro valley. It is found that the Hija village has the highest number of households and their total population is 2347 (male-1136 and female-1211). Dutta has the lowest households with total population of 385 (male-169 and female-216). It is also observed that Hong village has the highest population among all the villages, whereas households are less than that of Hija village. According to 2011 census female population is more than male population. Total households of Ziro valley villages are 2052 and its population is about 12699 (male-6177 and female-6522).

#### **Apatanis and its Management of Resources**

Primarily the Apatanis economy is agrarian in nature. They practice the sedentary agriculture from time immemorial. Thereby, they have developed a systematic and eco-friendly system of integrated rice with fish culture in a traditional way. They are supported by forest products, handlooms and handicrafts and other economic activities like horticulture products, contract works and business and also as daily labour throughout the year. The utilization of the land is categorized into three type viz. (a) Agricultural land (b) Grove land (c) Forest land. The lands which are in the vicinity of the villages are used for paddy and millet cultivation. The immediate surrounding areas of paddy field are basically used for growing bamboo, pine tree, etc. while the far away land is covered with evergreen forest. Cultivating households have three different types of land holdings viz. individual or private own land, clan land and village or common land. The individual lands are those which are inherited from ancestors and some of them are purchased from others. The pasture lands and nearby forests used for grazing and collection of firewood come under the clan land. The burial ground and play ground are own by the entire village.

**Agro-Forestry:** Practices of agro-forestry in Ziro valley with separate areas for grazing Ground, sacred groves, plantation areas, etc has helped optimal utilization of limited land to produce various resources while sustaining agriculture with improved yields. The Apatanis are well managed especially bamboo and pine in their private forest while felling grown up groves. It is found that local bamboos are never flowered since time immemorial. Thus, the Apatanis have developed forestry practice that is unique in the Himalayan region. They strictly control forest resource on clan lands with hefty fines even on themselves for felling the valuable trees without prior

permission from the competent members. Growth of this plantations are comparable to well managed white pine forest (*Pinus strobes*) in USA (Rechlin, Michael & R.Varuni).

The Table-2 illustrates that the bamboo gardens exist next to the horticultural garden or rain feed agriculture, having monoculture of bamboo and mixed vegetation with pine (*pusa*) and castanopsis spp. (*kiira*). The mixed forest is the subtropical broad leaf mixed vegetation that consists of quercus lanata, castanopsis spp., wild kiwi, etc and temperate vegetation such as taxes wallichiana, cephalotaxus sp. etc. Though all forest types are important for the community, but there is a high dependency on bamboo, pine and castanopsis spp forest products by the Apatanese.

**Table-2**  
**Classification of Forest and Sub-Forest Managements and its Uses**

Sl. No.	Forest Type	Local Name of Sub-Forest	Sub-Forest	Uses
1.	<b>Bamboo Plantation</b>			
a.	Monoculture (bamboo)	<i>Bijjee</i>	Individual bamboo forest, mixed with pine & castanopsis spp.	Fuel wood, food, handicraft, housing and ritualistic materials.
b.	Bamboo, Pine and Castanopsis	<i>Bijjee and piisa (Sansung)</i>	Individual forest (castanopsis, Bijjee with pine dominant forest)	Timber, fuel wood, food, handicraft, housing and ritualistic materials.
c.	Bamboo and Castanopsis	<i>Pinbu sansung, Uru sansung,</i>	Individual forest, family forest.	Timber, fuel wood, food, handicraft, housing and ritualistic materials.
2.	<b>Mixed Forest</b>	<i>Pinbu sansung, Uru morey, Hallu morey, Lemba booth morey</i>	Individual forest, Sub-clan forest, Clan forest and village forest.	Timber, fuel wood, food, handicraft, housing and ritualistic materials, wild edible fruits and herbal medic, etc.

All these forests are maintained through century old traditional ecological knowledge and its sustainable management of resources in the valley. These forests are maintained not only to meet the economic use such as fuel wood, fodder, food and timber needs of the community but also for socio-cultural and ritualistic purposes. Of these resources, households uses the bamboo shoots and pine groves most to meet the requirements for family consumption, house construction respectively. Other uses are like edible bamboo shoots, fencing, erosion control, fuel wood, handicrafts and materials for ritual ceremonies. The *sansung* (individual forest) are preserved for fuel wood and material source for ritual ceremonies such as *Myoko, Murung, Subu*, etc. The bamboo plantation is dominated by the *phyllostachys bambusoides* species. The maintenance and plantation of bamboo is done with utmost care through clearing of weeds and selective harvesting of young bamboo shoots and use of mature bamboo which is recognized through the development of fungus on the surface of stem. Normally it is harvested after every third year and so for various economic activities and fire wood purposes the value of which grows enormously in the valley.

Such systematic division helps to regulate selective harvesting of forest resources for different purposes like timber for house construction, edible bamboo shoots, fencing, erosion control, firewood, handicrafts and materials for ritual ceremonies. Traditional practices of harvesting forest resources of the Apatanis are well known for its sustainability whereas it is fast dwindling in other part of the State and in the World. This could possible with continued existence of local customary laws and spiritual beliefs which are enshrine in the Apatani valley and considered them as culture in their practices. The Apatani traditions have not only helped them to optimally harvest the resources but also helped their effective conservation of forest areas.

**Water Management:** The land used for cultivation of rice is efficiently irrigated through well managed irrigation system since time immemorial. The Apatanis have developed a scientific method of irrigation through indigenous technique with available local materials in the valley. The every stream that flow from the surrounding hills is called *borang* is tapped soon after it emerges from the forest, canalized at the rim of the valley and diverted by a network of primary, secondary and tertiary channels. In absence of large river, the water from small river or streams is used in such a way that all the fields get equal benefits of irrigation water. In order to share the equal distribution of water, a volume of water is diverted in feeder canal *segang* and then to ducks (*huburs*) through which each paddy field gets water supply. The feeder canals have branches to feed as many terrace as possible by blocking and opening the connecting ducks. All the diversions leading to the paddy

fields ducks are usually made up of wood and bamboo. The terraces are made along the gradient which is connected by using bamboo ducks of small circumference at the higher elevations where water intake is lower. In the lower valley where the volume of water is greater, pine ducks of larger circumference are used. These ducks are made from pine trunks split vertically, hollowed out and then the two parts are put back together. However, these days' big plastic and iron pipe are replacing them as it gives more durability and longevity to the farmers. The maintenance of irrigation is managed through cooperative efforts by all the beneficiaries under the supervision of selected person.

The flow of water from one field to another is maintained through a ditch (*mugho*) on bund and placed one or more outlet ducks. The ditch is especially for outflow of excess water as well as maintaining the desire depth. The desire level of water is maintained by putting straws or weeds accordingly from time to time. During winter season the irrigation system is thoroughly repaired so that it would last for 5-6 months even if there is a heavy flow of water in the stream due to heavy rains during summer season. Care is also taken so that no rice field gets flooded and damaged. Thus, the whole water management of the Apatanis revolves around three important factors namely mutual distribution of water, prevention of flood and soil erosion.

It is consider that the availability of irrigation water in the Ziro valley is due to efficient conservation of the forest around the valley which forms the crucial watershed for the streams to flow down the fields. This is possible due to strict customary laws governing utilization of forest resources. The traditional reverence for nature in forest is reflected in offerings to the forest Gods during festivals like Myoko and Murung play a significant role in its conservation. Such practices are of immense value in the world where blatant exploitations of nature is a major concern.

### **Fish Culture in Paddy Fields and Millet on Bund**

The terrace type of agriculture helps the inlet and outlet of water from one paddy field to another paddy field easily which is considered as the best suited to the system. All the paddy field has proper inlet facility for fresh water supply from the upper side of the immediate neighbour paddy field or else directly supplied from the irrigation source if the field is adjacent to it. It is equally significant to the fish culture in paddy field that the proper leveling of field helps the retaining of water in equal level over the ground for healthy growth of paddy and grazing of fish especially of big size agriculture which is commonly prevail in Ziro valley. In such a paddy field there is a faster growth of fish with the more natural availability of food supply. These paddy fields are surrounded by strong and thick dyke with good height depending upon the gradient of the area and flood prone zone. With these characteristics and its nature of paddy fields, the rearing of fish in rice field becomes a culture of farmers in Apatani valley.

The fish cultures in paddy fields are commonly practiced by the farmers in Ziro valley. It is highly depends on water source and its regular supply. The agriculture with good source of water supply and its connectivity led to the culture of fish in paddy field round the year by many of the farmers except during the harvesting period. They usually rear fish two times in a crop season. The common practice of fish culture in paddy field begins in the months of April and May (*Halying* and *Enda pillo*). Protection wall are also erected with splited bamboo all around the duck (*Hubur*) and ditch (*Mugho*) of fish rearing agriculture. Then, the field water are monitored frequently as during April and May months the rainfalls are scanty which ranges from 60 to 61.2 unit in milli meters only in Ziro valley.

Simultaneously, the paddy nurseries are transplanted from nursery bed to field and this continues till second week of June with the second round of transplantation where ever the newly transplanted paddy is not survived. Further, with this the millet are also transplanted from nursery bed (*Yorlu papii*) to paddy field bund only once during the same month. So the collection of fish nurseries from the private and government farms for culturing in newly prepared rice fields starts from April month.

The business oriented farmer culture two batches of fish in a crop season. First batch of fish is usually stocked during late February and early March before the transplantation of paddy saplings to the rice field. This period was found suitable to culture fry size fish nursery because the farmers found that the stocking of fish fingerling and advance fingerling sizes damages the newly transplanted paddy nurseries in root while searching for food in the paddy field. So, the first batch of fish is harvested in mid June and July. The farmers usually stocked fish nursery ranging from 100 to 1500 fingerling size depending upon the size of agricultural paddy field, its location, water supply and free from soil erosion and flood zone.

The Apatanese culture some fish species in their ponds such as common carp (*cyprinus carpio*), silver carp (*hypophthalmichthys rodepix*), rohu (*labeo rohita*), catla (*catla-catla*), mirigal (*cinihnus mrigal*) and grass carp (*ctenopharyn godon*). The common carp is most frequently and successfully cultured fish species in the paddy field of Ziro valley. The grass carp is not favoured by the farmers as it damages the standing crops when they are grown up in the rice field. Thus, the farmers culture all other fish species in their fish ponds only which are economically beneficial to them. It is found that almost 90% of fish productions are common carp followed by grass carp in Ziro valley. The second batch of fish was put in the month of June end and July. In this batch

the farmers stocked fingerling and advance fingerling sizes of fish nurseries and also returns all those half grown fish of the first batch in their paddy field. They allow these fishes to grow for three to four months and harvest in the months of September and early October before the harvesting of medium and late ripening varieties of paddy. However, most of the farmers rear single batch of fish especially the common carp during entire crop season as it is known to the farmers that the peak season for growing of fish in paddy fields are from April to August.

**Festivals and Rituals:** The agricultural activities of these villages are closely attached with the culture of the people in one way or the other for good harvest of crops. The Apatani Dree festival is celebrated in July every year to protect field from all kinds of pests, insects. This festival is basically celebrated for the harvesting of pest free bumper crops and also for the production of good horticultural products like cucumber, maize, millet, pumpkin, chilli etc. In this festival people participate from all walks of life. It involves cultural extravaganza for two to three days before start of the festival. This is followed by the grand celebration of festival on 4<sup>th</sup>, 5<sup>th</sup> and 6<sup>th</sup> July of every year with sacrificial of mithun, goat and hen on the beginning of the festival after chanting in Dree alters by priests. To coincide with this festival the Gora (select group of people along with priest) perform *Yapung* to appease sky God and Goddess for good rainfall during the entire crop season. A taboo of not carrying out any work in paddy fields and horticultural gardens for 3-6 days is observed during this festival.

The Myoko festival is celebrated in every two years in turn wise in a cyclic manner by seven traditional villages. These villages are divided into three groups for the Myoko festival celebration among these villages. Thus it relates among these three groups. This festival is also related to the agriculture and a taboo is observed by not working in the paddy fields during entire festival. The festival is concluded by performing the last ritual in the paddy field at the end of the festival. It is found that the agriculture and myoko festival are inter-dependent for the well being of the family as well as paddy crops. There are also occasional festivals like *Korlang*, *Yapung* which are usually performed in the middle of agriculture season to appease the God and Goddess for good rain and hailstorm free at the time of agricultural season. The performance of Murung festival is not compulsory for every household but they can take part in other household' celebration. The livestock of the families are considered to be equally important and the survival of these household animals is believed to be dependent on the blessing of home God.

## II. CONCLUSION

Land use pattern of Ziro valley has evolved out of century old experimentation on resource management and sustainable use of the limited land resources. Land has been systematically classified and regulated under the traditional customary norms for wet rice cultivation, dry cultivation, pine and bamboo gardens, community burial grounds, private plantations and community forests. Such a highly diversified landscape ensures a wide range of ecological niche, conducive to enhancing biodiversity in the valley. The relation with nature is regulated by their cultural practices such as Dree, Murung and Myoko, etc. and they are mutually support each other has universal value. The paddy-cum-fish culture of Apatanis is traditional in nature as fish is integrated with paddy without any modification and changes in indigenous agronomic practice of the tribe. It is the only kind of rizipisciculture primarily based on without supplementary feeding at Ziro valley in the entire north east states and India as a whole. This system utilizes the available limited agricultural paddy field judiciously to produce rice-fish-millet simultaneously which is considered as one of the best utilization of land. The paddy fields are also free from the use of agro-chemicals such as weedicide, pesticide and insecticide except the traditional organic manures. The techniques of production are traditional with little modification under the influence of improved modern technology. The Apatani farmers through the indigenous practices of rice-fish culture not only conserve biological diversity but also manage sustainable utilization of the available resources in the agriculture for their paddy + fish + millet benefits in the economy of Ziro valley. Thus, the Apatani rice-fish-millet culture can be a role model for rest of the country as well as not only for South-East Asian Countries but also for rest of the world towards sustainable organic farming of two or more crops at a time in given land. Therefore, the whole Apatani valley with this unique farming technique, preservation of culture and sustainable managements of natural resources deserves the declaration as World Heritage Site by the UNESCO for its unique environmental friendly mode of indigenous knowledge system having potential economic implications on the livelihood of farmers in Ziro valley.

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