

## A short summary of Nuosu Ecology and Ethnoecological Concepts

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The Nuosu people, who number about 2 million at present, are the largest ethnic group in most counties of the Liangshan Yi Autonomous Prefecture, Sichuan, as well as living in considerable numbers in Ninglang Yi Autonomous County, Lijiang Prefecture, Yunnan; Hanyuan and Shimian Counties, Ya'an Prefecture, Sichuan, Mabian and Ebian Counties, Yibin Prefecture, Sichuan; and in smaller numbers in other neighboring counties. The Nuosu, who are a branch of the official Yi minzu or "nationality," have inhabited the area in eastern Liangshan for about 2,000 years, around the same length of time they have probably been separated linguistically and culturally from other ethnic groups among the Yi. Probably due to population pressure on resources, compounded by increased differentiation of wealth, both brought upon by the introduction of New-World crops and certain developments in the macropolitics of the early Qing dynasty, increased warfare in the Nuosu homeland between 1650 and 1750 drove the Nuosu to begin a westward expansion that has lasted to the present day. Their arrival in the highlands surrounding the Baiwu valley, where we have conducted our research, in the late 1700s is part of this westward expansion.

The land of the Nuosu is in general harsh, lying at high elevations (almost entirely above 1500 meters, with most inhabited areas between 2000 and 3000 meters) with very few flat alluvial spaces and many steep slopes. On this kind of terrain, the Nuosu have traditionally pursued a subsistence economy based on complementarity among of agriculture, animal husbandry, and forestry, and displayed relatively narrow disparities of income between rich and poor.

Nuosu subsistence economy has traditionally combined agriculture, pastoralism, and foraging activities including fishing, hunting, and forestry. This kind of a mixed economy emphasizes diversification and insurance against disaster in several ways. First, crops have historically been diverse. Most families in the last 400 years have grown a combination of the traditional buckwheat, oats, wheat, barley--in rough order of abundance--with the now-important newly introduced corn and potatoes, introduced in the last few centuries, along with non-staples such as turnips and beans. Depending on terrain, staples may have been grown on alluvial plains in rotation with nitrogen-fixing beans, or on dry uplands or mountain slopes in either a short-fallow system of alternating years or a swidden system of forest-fallow rotation, which the Nuosu call *bbo qy*, or "burning the mountains." At the same level of diversification, families have always kept a variety of domestic animals. Sheep have probably been raised in the greatest numbers, where they were joined in some areas by the more nimble and versatile goats. Mutton was the primary meat served on many ritual occasions. Cattle of various sorts--primarily landrace breeds of oxen, were kept for pulling plows and sometimes carts, and for slaughter at major ritual events, while pigs, in contrast to Han Chinese practice, were also let out to pasture, but also fed scraps and greens at home. Horses--and sometimes donkeys or mules--pulled carts, hauled loads, and provided transportation on mountain paths.

Livestock were closely integrated into the agricultural cycle. During the

growing season, they grazed on pastures in narrow alluvial plains and valleys, forest understories, and slopes unsuitable for agriculture. After harvest, they were let into fields to graze on the stubble, and their manure helped restore soil fertility, especially in places where land was not fallowed nor crops rotated. The only livestock not let out to graze were chickens and waterfowl, which fed primarily on barnyard debris and household leftovers.

Forestry and forest stewardship were essential, even central, to this system. Wood was used as the primary fuel for the fires that cooked the food and warmed the house in wintertime, and was a building material in all types of houses, which were always constructed in a post-and-beam style with wood rafters and overhanging eaves, whether the walls were filled in with wood, stone, or mud according to local conditions, and whether the roofs were made of wooden shingles or of thatch. Wood was also used to manufacture a variety of implements such as plows, harrows, wagons, and handles for metal tools. Wooden serving dishes and drinking vessels --usually made from paperbark birch or rhododendron wood--were produced by specialist clans on locally-constructed pit-lathes. The leaves and branches of forest trees, both coniferous and broadleaved, were mixed with animal manure to make field fertilizer, deposited as bedding in animal stalls, and used as protection against rain on walls built of local mud. Bamboo, found in deeper and remoter forests, was woven into a variety of basketry, from large backpacks used to carry grain, to winnowing and serving trays, to various kinds of storage containers. A variety of wild food plants and mushrooms grew in the forests and on their margins, and medicinal plants were found in variety and abundance. In addition, forests were habitat for game animals, such as deer and fur-bearing species including bears and red pandas, and for birds whose calls had important ritual and divinatory meanings.

Of the three corners of the Nuosu subsistence triangle, two--agricultural land and forests-- were traditionally used in a socially egalitarian way. Nuosu society is strongly hierarchical, in that its constituent patrilineal clans are organized into a series of social strata, sometimes called castes in analogy to their Indian counterparts. The higher castes, the *nzyimo* and *nuoho*, were local rulers, and exacted forms of symbolic tribute and labor obligations from the lower castes. The good-caste commoners, *qunuo* or *quho*, were free peasants under the overlordship of, and with certain ritual and military, but minimal economic, obligations to their overlords. The lower strata were *mgajie* serfs, farming land independently but owing heavier tribute to their *nzyimo*, *nuoho*, or *quho* masters, while *gaxy* ("feet by the fire") were domestic slaves. But most accounts of this system while it was still functioning in unmodified form--before the Communist-led "democratic reforms" which began in 1956--emphasize that the differences in daily lifestyle and ordinary consumption between the various strata, with the possible exception of the Hanified *nzyimo*, were not great. They wore the same clothes, ate the same food, and lived in houses of similar construction.

This egalitarian consumption in the face of rigid social hierarchy was the result of the economic correlates of social status being connected with livestock and luxury goods, rather than with agricultural land and products or with forestry. Prominent *nuoho* or *quho* who attained the status of *suga*, or rich people, were known by the amounts of livestock, slaves, gold and silver ingots or jewelry they owned, but such ownership was connected to production of agricultural or

forest goods, except in cases where slave labor was used. Serfs were a source of manpower for the lord's military expeditions and sometimes labor on the lord's land, but their consumption of staples, which were not ordinarily traded and thus had little exchange value, differed little from that of their lords. The same was true of forests, which were regulated by communal norms of use that allowed roughly equivalent access to wood and other products for any families that needed them.

It was the third foot of the tripod, the pastoral economy, where the rich were clearly distinguished from the poor—a great lord with hundreds of sheep and goats, tens of cattle, and several horses was very different from a *mgajie* serf with a few sheep, an ox, and no horse. Ordinarily, livestock were slaughtered only on annual feasts and other important ritual and political occasions, or to entertain important guests; at these times meat was distributed to everyone in the community as well as to guests come from outside, and the richer and more prominent the host, the more people would come to the feast to be fed and obligated to the family providing the meat. But because sheep, cattle, and horses were themselves signs of wealth, owners of large herds were as prone to accumulate as to consume, and when they did consume, the meat was distributed among people of all strata.

Such a system, where there is no incentive to monopolize subsistence resources such as land, where animal products are redistributed by leaders and other hosts in return for prestige, allegiance, or ritual service, and where forests and their products are regulated by ritually-reinforced community norms, is very compatible with an ecologic ethic of insurance, sustainability, and resilience, rather than one of maximum exploitation and growth in consumption. The tendency toward this kind of ecologic ethic is reinforced in the Nuosu case by the unpredictability of the environment. In the high-mountain, low-productivity ecological niches populated by the Nuosu, both sudden and slow weather events were always a danger to subsistence resources. Most rain comes in the summer months, and flooding is a danger to low-lying fields. Sudden summer hailstorms can knock out crops, as happened to the ripening corn in parts of Baiwu in August, 2004; and an abnormally cold winter or a late start to spring rains can strain pasture and fodder resources, killing or forcing slaughter and consumption of livestock. In such an environment, the insurance provided by diversification—depending on field crops, animal husbandry, and forestry at the same time, as well as diversifying one's activities within each of these spheres, is necessary to raise the chances of human physical and economic survival. Diversification at the household level was also matched by a strong ethic of sharing among clan members and close affines, so that relatives provided insurance for any household whose individual fortunes suffered disproportionately in a given year.

It should be no surprise then, that when we look at Nuosu folklore and accounts of cultural values, we find an ethic that stresses long-term sustainability of resources and economic prestige based on accumulation and retention of wealth in specific kinds of goods, rather than short-term utilization of resources and economic prestige based on maximum consumption. This ethic can be seen not only in the reconstructed economic practices described above, but also in explicit cultural rules and sayings still remembered by older members of communities around the Baiwu valley.

Central to this complex of ecologic-ethical norms and practices was the concept of preservation of resources for future use, owners' responsibilities to use resources in such a way that they can be sustained by future generations of the owners' patriclans. More explicitly, the Nuosu thinking repeatedly makes parallels between the reproductive continuity of the patriclan and the productive continuity of resources, particularly fertile farmland that produces food, clean water that nourishes plants and animals, and the trees that keep the water clean by preventing erosion and watershed decay.

Two Nuosu *lurby*, or proverbs, illustrate this reproduction-production parallel as applied to fertile farmland. *Bbo ggu mu we a ndo; pu nyu jji we a zze* [Don't allow the fertility of a piece of land to be lost; don't neglect thanks for a gift from your parents] expresses the idea that land, not as a commodity but as something that has fertility, or productivity, is a resource that needs to be passed down from generation to generation within the clan. 2) *pu nyu mu su vi; vi ke shy su vi* [Land belongs to those who work it; affairs belong to those who carry them out], expresses the idea of responsibility for one's own actions--you are responsible for the consequences of your behavior in a variety of areas, including keeping your land fertile and productive.

The same kind of thinking is applied to water resources and watershed protection. *sy zzu i pa mu; yy zzu i pa mu* [trees are from your parents; water is from your parents] means that trees and water resources, necessary to the continuation of production, are closely connected with the continuation of the family and society from generation to generation. Even more to the point is the saying that *o nyi a bo mi; yy kit pu ji she* [the maternal uncle's household and the father's household are the source of human life; water and the trees by the water are the source of sustenance]. In this saying, the close interdependency of a water source and the trees that keep the water from eroding the land and fouling itself in the process is compared to the close interdependency of a clan and the affinal clans that provide wives, and thus reproductive continuity.

A very striking element of this ethic of resource conservation is the recognition of the importance of what we would now call ecosystem services provided by forests. Although forests were exploited directly in the form of wood, medicine, and animals hunted, their value as preservers of ecosystem quality is just as important or more so. This is also recognized by local norms of forest use in the Baiwu area. According to several elders, in the time before the Communist "Democratic Reforms," when people lived in scattered clusters of homesteads, each family or group of closely related families owned exclusive rights to the forests above their homestead, where others could log or collect wood only by the owners' permission. Forests, unlike pastures, were not common-property resources, except in more distant areas. But there were strict norms on when trees could be cut--between the flowering of the rhododendrons in the spring and the last harvest of oats in the fall, no white wood could be cut; if someone violated this prohibition, he would be blamed by the community for any hailstorms that happened that summer. Again, there is the explicit recognition of watershed production in the rainy season, which is also the growing season.

Despite the logical and empirical support for an insurance or resilience-oriented ecologic ethic among the Nuosu, we need to consider the temporal scale at which their traditional ecological adaptive system would have been

sustainable. There is some evidence that the introduction of potatoes and corn as staples in the 17th or early 18th century had a paradoxical effect. On the one hand, there is an *lurby* that says (**find exact wording**)--since there have been potatoes, there has been no starvation--apparently the insurance provided by old-world grains as staples before the introduction of corn and potatoes was not always successful. On the other hand, in the second half of the 18th century, many Nuosu began leaving their centuries-long homeland in the eastern parts of Liangshan and migrating westward across the Anning and Yalong rivers, to areas where they are the majority group in ethnically mixed areas today. Folklore attributes the start of this migration to increased warfare among *nuoho* aristocratic clans and their commoner and slave followers, and some scholars have deduced that this increase in warfare may have been due to population pressure brought on by those very demographic increases enabled by the stabilization of food supply after the introduction of corn and potatoes.

Recently, scholars and members of other ethnic groups in the Western parts of the Nuosu's territory have also blamed Nuosu swidden agriculture or agro-forestry for part of the disastrous deforestation that has gone on throughout the mountainous regions of Southwest China since the 1950s. It is possible that, given the accelerated growth of the Nuosu population with even the minimal public health measures brought to them by the PRC government, their population density in the highly forested uplands may have exceeded the level that would allow even a people driven by their insurance- or resilience- centered ecologic ethic to sustain their productive system for more than a few decades in any given space. It is also possible that the Nuosu migration, which went on for about 250 years before it was slowed--though not completely halted--by Communist policies, allowed them to sustain their productive system for hundreds of years because they were expanding into otherwise less populated territories, and when they reached the limits of available territory, the destructive potential of their system began to be felt. It is difficult, however, to draw such a conclusion unless we factor out the contributions of programs driven by the production-maximization ethic of development, which the Chinese Communist Party promoted and indeed forced on the people of the southwest, that undoubtedly led to such aspects of ecosystem degradation and deforestation and erosion.

In this context, it is important not to romanticize the Nuosu ecologic ethic or exaggerate its wisdom or generality. The importance of wealth in livestock may at some places have led to overgrazing. The overall ecologic ethic was definitely a more Pinchot-like desire to use resources sustainably than a Muir-like appreciation for the environment as a whole, although Nuosu poems also show a purely aesthetic appreciation of landscape. Many of the ideas were very limited in their application; parallels are made not between reproductive and productive continuity in general, but between patriclan and farmland continuity; prohibitions on cutting trees at certain times are specific to local climate and phenology. And the main purpose of resource conservation is to ensure kin-group continuity; resources are not valued for their own sake. Nevertheless, in the Baiwu watershed, Nuosu practiced a system of agro-silvio-pastoral production that appears to have been sustainable over a decades-to-centuries scale, and that contrasts sharply and dramatically with the system of production

guided by the development-oriented ecologic ethic of the Chinese Communists.