

Traditional Knowledge and Conservation

Author(s): C. Madegowda

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Traditional Knowledge and Conservation

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The Soliga tribe in the Biligiri Rangaswamy Temple Hills of Chamarajanagar district of Karnataka has maintained a continuous and intimate interaction with the forest, deriving most of its basic requirements from the forests. The Soligas used to engage in shifting cultivation and collection of non-timber forest produce which was harvested in an indigenous and sustainable method until the BRT area was declared a wildlife sanctuary. This paper studies the indigenous traditional knowledge of the Soliga tribe about ecology, forest conservation and resource management systems. It also describes tribal clan structures, practices of harvesting and conservation and the scope for developing a conservation regime that incorporates these aspects in forest management.

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Madegowda C (camde@atree.org) is with the Ashoka Trust for Research in Ecology and the Environment, Bangalore.

It is estimated that 90% of tribal communities in India live in or in close proximity to forests. The forests that remain in India today are mostly in tribal areas. According to the 2001 Census, the tribal population in the country was 84.3 million accounting for 8.2% of the total population. The tribes have traditionally lived in about 15% of the geographical area of the country, mainly in forests, hills and undulating inaccessible terrain in plateau areas which are rich in natural resources. As per the Forest Survey of India report (2003), about 60% of the forest cover of the country and 63% of the dense forests lie in 187 tribal districts.

The Biligiri Rangaswamy Temple (BRT) wildlife sanctuary derives the name *Biligiri* ("white hill" in Kannada) from the white rocky cliff on which the temple of Vishnu (locally known as Rangaswamy) is situated. It is also believed that the hill range gets its name from the mist and clouds that cover these hills for a greater part of the year. The location of the BRT sanctuary is unique. The Western Ghats project in a north-easterly direction between 11° and 12°N and meet the splintered hills of the Eastern Ghats at 78°E. This unique extension of the Western Ghats constitutes a bridge between the Eastern and Western Ghats and the BRT sanctuary (11°40'-12°09'N and 77°05'-77°15'E) is located almost in the middle of this bridge. Thus the biota of BRT sanctuary can be expected to be predominantly of the Western Ghats in nature with a significant proportion of elements of the Eastern Ghats as well. The BRT wildlife sanctuary area is spread over 540 sq km and it is well known for its rich biodiversity of flora and fauna.

The total population (2001) of the tribal groups of Soliga, Jenu Kuruba and Kadu Kuruba in Chamarajanagar

district is 31,445. Out of 144 *podus*/colonies, 62 are located within and on the periphery of the BRT wildlife sanctuary; the total population of Soligas in these settlements is 16,487. The Soligas have lived here for centuries and have had a continuous and intimate interaction with the forest, deriving most of their basic requirements such as food, fodder, fuel, fruit and fiber from the forest. They lived in isolated hamlets or *podus* and engaged in shifting cultivation and collection of non-timber forest products (NTFPs) for their livelihood until the BRT area was declared a wildlife sanctuary and they became sedentary.

This paper seeks (1) To understand the traditional knowledge of the Soligas on ecology, forest conservation and resource management. (2) To understand their traditional system of agriculture and land use. (3) To understand their traditional institutions and their functions.

Detailed data were collected from the older members of the Soliga tribal community. Their daily life and activities were observed and information was collected through interviews. Information was collected on Soliga clans and forest conservation; the use of fire for conservation and regeneration; on Soliga festivals and conservation; methods of shifting cultivation and use of indigenous seeds; traditional rituals associated with rain and thunder and traditional knowledge of flora and fauna; and, harvesting of NTFPs.

Soliga Clan and Conservation

Kinship structures of the Soligas in BRT are built around five *kulas* (exogamous clans). They are: Teneyaru Kula, Halaru Kula, Belliru Kula, Suriru Kula and Selikuru Kula. Members of the five *kulas* are invited for rituals and ceremonial occasions, like birth, death, festivals and marriage. Over the course of time a sixth clan called Baleyaru Kula has been included in the *kula* structure.

There is a ranking or hierarchical order in the clan structure, and the status of the clan entitles it to hold office in the traditional *nyaya panchayathi* (tribal council) which takes collective decisions and

settles community disputes as and when they arise (Table 1).

Table 1: Soliga Clans, Floral Symbol and Traditional Office

Clan	Floral Symbol	Traditional Office
1 Selikuru Kula	Sanna Malige	Yajamana
2 Teneyaru Kula	Boddaganna Malige	Manegara
3 Sururu Kula	Suthu Malige	Chaluvadi
4 Halaru Kula	Halu Malige	Pattagara
5 Belliru Kula	Bili Malige	Kolkar
6 Baleyaru Kula	—	—

The knowledge of the Soligas and their practices of conservation are linked to the clan (kula) system and their configuration of the landscape. Each kula has its own six important places of worship: *Devaru* (god); *Maramma* (goddess); *kallu gudi* (stone temple); *Veeru* or *Muni*; *habbi* or *jala* (waterfall); and, *samadhi* (burial ground). All these are within the boundary (*yelle*) of the kula, each clan having its designated geographical area. If any other clan member wants to enter that area and perform a ritual there, he has to seek permission from the respective kula members, pay them Rs 5.25 and offer betel leaves to them. Soligas traditionally worship gods (*Devaru*) like Karaiah, Jadeswamy, Kethappa and Mahadeswara. They also worship trees (*Michelia champaca* locally called *Sampige* and *Terminalia bellerica* locally called *Tare*) and animals (bears (*Karadi devaru*) and elephants (*Ane devaru*)).

Soligas believe in the existence of supernatural beings as protectors and benefactors of humans. They believe in the spirits of the dead and practise ancestor worship. The spirits are *Muneswara*, ghosts of dead sages living in mountains, and *Veeru*, dead spirits, sometime capable of causing harm to human beings. Because they believe in and fear the *Muneswara* and *Veeru*, the Soligas rarely move in areas that they regard as abodes of these spirits.

Forest fires benefit and also harm the forest depending on where they occur and the intensity and timing of the fire. Soligas have used controlled ground fires for long, especially when they practised shifting cultivation, for NTFP harvesting and as a general forest management treatment. Soligas believe that controlled ground fire is good for the control of invasive species

like *lantana* and in regeneration of local indigenous species. They also believe that it helps the dormancy of seeds, controls pests and diseases and ensures regeneration and availability of food for local wildlife. According to Soliga elders, the control of fire has led to a change in forest structure and wildlife habitat because of the increase in invasive species, which has serious implications for forest conservation.

Soligas say that fire helps the management of the forest and that fire has always been used as a management tool. They mention that small ground fires are set in the months of January and February and this only burns the grass, dry leaves and does not kill seedlings or lead to canopy fires. This was the practice when the community was undertaking shifting cultivation. After the BR Hills were declared the BRT wildlife sanctuary, the government stopped shifting cultivation. At present the Soligas practise settled agriculture on forest land. Small ground fires also helped in regeneration of forest tree species and controlled the spread of hemiparasites (*upplu*) on gooseberry trees. They also helped grass to grow which provided food for herbivores. Recently, BRT has been invaded by *lantana camara* and this weed has spread to most forest areas. As a result, animals do not have enough grazing areas and they are therefore changing their food habits and shifting to other forest areas.

Soligas celebrate important traditional festivals like *Rotti habba* and *Hosa Ragi habba*, Hindu festivals of *Mari habba* and *Gowri habba*, *Sankranthi habba*, *Yugadi habba* and other agricultural rituals. *Rotti habba* is celebrated once a year. Each kula has its god and before celebrating the festival the elders discuss amongst themselves and collect food items and money. A procession is taken to the Soliga settlement where they gather and stay in the podus; at night the *pooja* and *gorukana* dance are performed by them. This happens in all the nearby podus. After this, they fix the day in the week when the festival will take place. On the day of the festival they put the fire *koda* in front of the temple and in the night bread (*rotti*) is made of ragi flour and pressed into *butea monosperma* (*muttagad*) leaves and

roasted over a fire. In the evening they walk on the ceremonial fire. They then distribute the *rotti* with rice and pumpkin and vegetable curry. During the festival the *Thammadi* or priest is possessed by the god and the people pray and ask the god to keep Soligas in good health, to provide good rains that year, to keep the forest in a good condition and to provide a good agricultural harvest.

In the night the Soligas perform the traditional dance called *gorukana* and the women sing songs called *aduke*. In the *gorukana* songs, initially they sing about the gods of Mahadeswara swamy (Holaga, Kagga, and *gorukana* about the different gods of Dodda Sampige, Chikka Sampige, Basappa, Kethappa, Jadeswamy, Kumbeswara, Mahadeswara, Biligiri Rangaswamy, Bedaraiaru, Karaiah, Dodda raiaaru and other gods). The *gorukana* songs are rich in details about the different flowers, waterfalls and tree species in the forest and animals, birds, firewood, butterflies, insects, girls and the ragi they grow on their agricultural lands. The dances go on all night from 8 pm till 6 in the morning, and all the elders and children do the *gorukana* dance. In *aduke*, the women sit in a group in front of the god with one man called Guru. He starts the songs first about the gods: Biligiri Rangaswamy, Karaiah, Jadeswamy and other gods; he then goes on to sing about the flowers, trees, waterfalls, animals; and about other gods, birds, insects, butterflies and different animals.

All songs reflect indigenous knowledge of forest flora and fauna. The songs describe species and enable the transfer of indigenous knowledge from one generation to the next among the tribals, and this helps to conserve and keep alive the knowledge of the community. They believe that the gods will be happy when they dance and sing, and that there will be good rains and good harvests. This is also wished for the animals of the forest and for plant species. After the new crop is harvested the *Hosa Ragi Habba* festival is celebrated from February to May each year in honour of *Hadagu* or *Mane devaru* (goddess). Balls of ragi flour and curry are prepared and offered to the goddess. The food is then distributed among the members of the community.

Shifting Cultivation

Shifting cultivation appears environmentally more sustainable than most permanent farming systems under humid tropical conditions. Most studies on shifting cultivation have focused on the effects of management practices and very little research has been devoted to agronomic improvement of crop production in the system, mainly because the system has been considered inherently primitive and even anti-development. The problem is that shifting cultivation is more frequently compared with forestry activities or even natural forests rather than with other farming systems.

Shifting cultivation (or *jhum*) is a form of agriculture widespread in tropical moist forests (therefore the term "slash and burn" agriculture). Crops are grown for one or two years until the soil is depleted of nutrients. Then the area is abandoned and a new patch is occupied. The same patch of forest may be re-cultivated years later.

In north-eastern India, where shifting cultivation is a common practice, a typical fallow period lasts about 10 years. Some ecologists have suggested that *jhum* may increase biodiversity because it creates new habitats, while others see it as a largely destructive practice (Raman, Rawat and Johnsingh 1998). In Arunachal Pradesh, due to limited arable land and increasing population growth, farming will continue on the ecologically fragile and marginal mountain lands, including those situated on more than 300 slopes. Considering the adverse impacts of the shifting cultivation such as loss of precious top soil, nutrients and forest biodiversity, destabilisation of slopes and its low productivity, sustainable farming alternatives need to be developed and implemented. If shifting cultivation is allowed to continue in its present form, land degradation and the impoverished living conditions of resource-poor upland farmers are bound to worsen with time. However, as yet we have no viable alternative to the practice of shifting cultivation which has been successfully tested and widely accepted by the people. Therefore, it is urgent to seek new options for farming on hill slopes that can enhance crop yield, stabilise the slopes, conserve the soil at an acceptable level and modify the existing practice of

shifting cultivation suitably so that these options will be widely accepted by the people in mountain areas (Barik 2002).

Various indigenous peoples have been successfully practising agriculture in the tropical rain forests in the world for thousands of years and these forests had survived almost in their entirety until well into this century. The agricultural practices of one of these indigenous groups of forest farmers – the Tawahka in Honduras – illustrates that agriculture can be sustainable without inflicting irreparable damage on the forest. A comparison with the practices of the neighbouring immigrants shows that it is not agriculture per se but rather a lack of knowledge and a variety of other external factors that can lead to permanent conversion of forest to other land uses (House 1997).

Many indigenous groups throughout the tropics practise a mosaic of land use patterns in which conservation and sustainability ensure resources for future. The Dayak historically – and even at present – practice shifting cultivation and hill rice farming with long fallow periods, intensive agro-forestry and natural resources extraction. Shifting cultivation is a complex system dedicated to non-permanent shifting field use that is associated with fire for clearing land in Indonesia (Crevello 2004).

When the Soligas practised shifting cultivation (also known as *podu* cultivation), they stayed three or more years in the same place. The land for cultivation was selected by the elders; after the land had been identified, the weeds and bushes were cleared. The trees were left standing in agricultural land in the forest. After this, the area was subjected to a fire in January-February and the ash of burnt plants added nutrients to the soil. After the onset of the monsoon, the Soligas sowed maize, field beans, *togari*, pumpkin, cucumber and various climber beans which were trailed on all the trees available in the cultivated land. After the maize, *avare* and *togari* grew to 1 to 2 ½ feet, the Soligas would start to sow finger millet (*ragi*), foxtail millet (*navane*), amaranths (*hedda*) and mustard (*sasavi*). Before sowing, rituals would be performed to the goddess of the earth (*Bhumi Tai*). At the beginning of the monsoon they planted

traditional bananas, chillies, papaya, guava, jack, acid lemon, and lemon. They used the *kalakotu* (hoe) for agricultural activities. Women used to take a more active part in agricultural operations than men. The Soligas cultivated the land until the fertility declined and would then shift to another place.

When the Soligas were involved in shifting cultivation they also helped in forest conservation. As they moved, some of the crops mentioned (like bananas, tubers, mustard, amaranths, *ragi* and *ragi* grass, papaya, tapioca, *sebu*, bottle gourd, cucumbers, pumpkin, climber beans, lemon and jack fruit) were left in the land. The remaining banana plants were eaten by wild boar, and the *ragi* grass, pumpkin, cucumber and field beans (*avare*) provided food for deer, wild boar, barking deer, ants, parrots and doves (*sorehakki*). Papaya, tapioca, *sebu*, and different tubers provide the food for the bison, deer, wild boar and sambhar. Mustard, amaranths, guava, and papaya fruits were eaten by different birds. Thus shifting cultivation provided food for animals for one or two years and conservation benefited through traditional agricultural practice. Even when the crops were being cultivated the wild animals, insects, ants and birds came and fed on the different crops.

Soligas dug pits or wells for drinking water wherever they practised shifting agriculture, which became a source of water for animals after they moved away. Wherever the Soligas lived they usually dug two to five pits or wells for drinking water for daily use. The indigenous knowledge associated with water management and use too contributed to conservation by providing waterholes for wildlife. *Podus* were scattered all over the forest during the days of shifting cultivation and poachers kept away from these areas because they feared that they would be reported to the officials of the forest department. This helped in information flows and kept a check on poaching.

When the areas of shifting cultivation were abandoned there was a good growth of grass and other plants so there was plenty of food for wild animals and the spread of invasive weeds were checked. Today, due to the spread of *lantana*, animals are raiding agricultural lands outside

the sanctuary. Due to this animals are killed by electrocution, especially in the plains surrounding the wildlife sanctuary.

The Soligas had their own ritual of rain-making if the monsoon did not set in on time. They would collect a fresh honeycomb and squeeze it on the idols of Karaiah, Basappa, Huliyaappa and other gods. It was believed that it would rain within a few days after the ceremony. After it began to rain the Soligas would go to their temple and wash and clean the idols after the priest (Thammadi) and other locals performed the pooja.

Traditional Ecological Knowledge of Flora and Fauna

Tribes have been living in forests, their ancestral land and their habitat for generations and there exists a spatial relationship between the tribes and biological resources. They are integral to the very survival and sustainability of the forest ecosystems including wildlife, and this is built on a symbiotic relationship of the tribal with the forest.

Many countries have attempted to force indigenous groups to abandon traditional livelihoods in order to "save the forests" and tried to assimilate them into "modern society" in the name of development. Many development and conservation related projects have failed due to the lack of involvement of local communities and the lack of knowledge about and insensitivity to local tribal people and ecosystems.

The Soligas have a holistic outlook on life and their indigenous knowledge is also holistic in nature. The Soligas have configured and classified the forest into *kanu kadu* (evergreen), *male kadu* (deciduous), *bole* (grasslands) and *nadu kadu* (scrub). This classification is based on the nature of the vegetation. The Soligas know the names of all plants in the local language and they can identify all the plant species and their habitat names.

Soligas worship animal gods like elephant (ane devaru), bear (karadi devaru), tiger (*huliyirappa devaru*, considered to be the mount of Lord Mahadeswara), wild boar (*handi devaru*) and bison (*kadamme devaru*). All the animals Soligas traditionally worship belong to the different clans (kula). The Soligas know animal habitats, food habits, reproduction season and other details. This indigenous knowledge

has been passed on from one generation to the next. The Soligas can identify animals through sound, smell, and their pug marks. They can pick up scents that are carried by the wind and have keen eyesight. They can also pick up danger signals from bird sounds and alarm calls.

Whatever research is conducted on flora and fauna is built on the indigenous knowledge of the Soligas. This includes specific research concerning animal habitat, food habits, living areas, reproduction times and so on. The tribals provide this indigenous knowledge to researchers, and based on this researchers develop their scientific studies. Researchers depend on local tribal assistants and guides for their research work and the outcome of the research helps in forest management. Those who conduct research on flora are dependent on indigenous knowledge to understand the habitat of each plant, availability, flowering and fruiting. Tribals provide these inputs to researchers and this benefits forest management and conservation.

Tribals employed in the forest department provide information on forest habitat, animals and plants habitat, water sources for animals. They know each and every aspect of the forest and this helps the other forest department staff to make management decisions for conservation. Indigenous knowledge of animals is also very useful during animal census because they know the animal habitat, water sources, pathways, specific forest dwelling places, pug marks and other evidence.

The Soligas have an intimate traditional knowledge of forests and forest conservation; their knowledge and association with the forest spans shifting cultivation, traditional festivals, worship of gods and goddesses, sacred sites like *veeru* or *muni*, *habbi* or *jala* and *kallu gudi*, *kula* (clan) systems, fire management, rain making rituals and wind and rain control methods, worshipping animals gods and trees, sacred sites and sacred forests. Today, Soligas provide their traditional knowledge and interpretation skills to help researchers, forest department staff and tourists. The Soligas are involved in forest conservation through their indigenous knowledge of resources and ritual practices. Forest conservation is part of their life and livelihoods and their entire way of life is in

harmony with nature. There is a very strong symbiotic relationship between the Soliga tribes and the forest; they have strong cultural, social, political and economic ties to the forest and have practised conservation since times immemorial.

Soligas have a rich heritage of traditional knowledge, which has been used for centuries. This traditional knowledge is closely interlinked with the forest. Soligas are brought up and die in the relationship with their forest; all aspects of tribal life from birth, marriage, traditional rituals, traditional festivals, and tribal songs are linked to the forest. The Soligas are very knowledgeable about the use of natural resources and associated skills, about forest types, animals, medicinal plants and health. Various researchers have documented this relationship. Somasundaram (1998: 17) notes:

The Soligas appear to be actually aware of their environment; their concern for the environment appears to be a product of their necessity and intuition. Years of close association with nature might have made them realise her secrets and inner life. Their life-line being forest, by sheer necessity too, preservation of forest has been ingrained in their culture.

Similarly, Sudarshan (1998: 17) points out:

Soligas have a holistic outlook on life; their indigenous knowledge is also holistic in nature. Till recently, Mother Nature was the single largest factor influencing their culture and the tranquility of their life was undisturbed by modernisation. They have their own self-sufficient economy closely characterised by the simplicity of their life styles and minimal requirements. All their needs were met by the abundance of virgin forests. Their lifestyle was so harmoniously integrated with the ecological cycle of the forests that the sub-ecosphere of their settlements never harmed or checked the growth of the larger ecosystem of the Forest.

Harvesting Non-Timber Forest Products

The tribals in India live in a variety of ecological, socio-economic and technological settings. Each tribe presents a unique situation in terms of resources endowment, resource use patterns, technological levels and levels of living. Thus at one end of the scale, there are oceanic tribes who are in the primitive stage of food gathering, hunting and fishing and on the other there are tribals who are

good farmers. Settled cultivation is the primary source of livelihood for the majority of the tribal population.

The forest, which is considered the soul of the country, is also the backbone of the tribal economy. Therefore, sustaining the forest ensures the sustainability of the life style of the tribes inhabiting them. The life of a tribal family or village mostly depends upon the productivity of forests and the availability of NTFP.

Soligas are dependent on subsistence agriculture for their livelihood and also on the collection of NTFP like honey, lichens (moss), soap nut (*Acacia sinuata*), roots of magali (*Decalapis hamilton*), fruits of amla (*Phyllanthus emblica* and *Phyllanthus indofischeri*), soap berry (*Sapindus trifoliatus*) arale (*Ternimalia chebula*), tamarind (*Tamarindus indica*), broom stick, gum (*Gum arabica* gum karaya) wild turmeric (*Curcuma angustifolia*), tarekai (*Terminalia bellirica*), jamun (Nerale) (*Syngizium cuminum*), silk cotton (*Ceba centanra*) and wild mango (*Mangifera indica*). Nearly 50% to 60% of their income is through the collection of NTFPs (Hegde et al 1996).

Soliga in BRT harvest honey from different types of rock bees – *hejjenu* (*Apis dorsata*), *thuduve jenu* (*Apis cerana*) and *kaddi jenu* (*Apis florae*). Nearly 20 to 25 tonnes of honey are harvested every year from the rock bees and a small quantity of honey is also collected from other bees. The Soligas harvest honey during the monsoon months of April to June and again in the month of November, though during this season they only harvest two to three tonnes of honey. The bees live in the forest for about four months and migrate to agricultural land in the plains during the remaining months.

The Soligas follow traditional harvesting methods which are sustainable. They harvest one or two bee colonies in rocks or trees. The Soliga generally collect honey during the day; if they want to collect honey from more than two colonies, they do so during the night. The soligas perform a puja or cultural rituals to pray to the gods, goddesses and the forest before they begin to harvest the honey. They collect different green leaves and small dry sticks and make a smoking torch (*sute*); they also light small fires under rocks or trees with different green leaves and small

sticks for smoke, which reaches the bee colonies. Two to three men climb the tree or rock with the *sute*, an axe, and a canopy or cover made with local fibers, along with a vessel or container for the honeycombs. The bees fly out from their colonies because of the smoke, and the men use a wooden knife to harvest the honeycombs. The honeycombs are then brought down, and the honey is separated from the comb, which is left along with its pollen as food for animals, birds and insects.

During the time of honey collection, the harvesters sing the songs about the bees, how the bees collect pollen from different flowers; they also narrate the items used for the collection, how far they go and also sing about how carefully the honey is collected (*Anna ne kembare bareyali jenade, Nodi kuyolu jenana, Kuguru habbina kudi-malu annane arumolad anigaddi, muru molada muddu sute*). The honey is harvested only by skilled harvesters and not all members of the tribe. Each group consists of six to 15 harvesters, and the number also depends upon the number of colonies available on the tree or rocks. The harvesters usually leave two to five colonies in the tree or rock itself for the regeneration of the bees.

Soligas pick amla from trees which have more than 25 kgs of fruit; trees with less fruit are not harvested but the fruit is left on the trees. Further not all the amla fruit is collected, and enough is left on the ground as well as on the trees, so that it helps the regeneration of the plant and also provides food for animals. This practice is also followed in the harvesting of other fruits like soap nut, soapberry, wild mango and jamun.

While collecting magali beru (*Decalapis hamilton*), only a few roots are taken and two to three roots left in the plants after harvesting the roots. Soil is also filled in which will help the regeneration of the plants so that the roots can be collected in subsequent years. Only big plants are harvested, not the small plants. The same practice is followed when the Soliga collect tubers (*neve, nure* and *belare*) for consumption. This traditional indigenous knowledge is transmitted from one generation to the next generation, by taking children to the forest when older members or parents go for collection and showing them the harvesting methods practically,

so that they will also follow the same harvesting techniques or methods which help in the regeneration of plants and animals.

Conclusions

The Soligas have a rich and deep traditional and indigenous knowledge of ecology which is passed on from one generation to the next.

The Soligas share their knowledge about different aspects of forest conservation and resource management with researchers, tourists, and the forest department. Modern conservationists, researchers, and the forest department should involve the local tribal communities and, in consultation with them, utilise their ecological traditional indigenous knowledge and resource management methods and techniques for conserving the forest and resource management.

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