

3. Sustainable resource use and forest conservation by the Kaani indigenous community of Kanyakumari forests in the Western Ghats, India

S. Davidson SARGUNAM

3.1. Status of Indian forests

India is one of the world's 12 megadiverse countries and it has two of the 18 biodiversity hotspots, namely the Eastern Himalayas and the Western Ghats. India is perhaps one of the few countries whose Constitution enshrines the concept of environmental protection and specifies this as the bounden duty of the State as well as of all the citizens. A number of legal and policy initiatives have been taken to protect and conserve forests and wildlife, along with its biodiversity. India has also led the world in participatory approaches to forest management through the Joint Forest Management initiative.

Humanity faces exceptional challenges of eroding natural resources and declining ecosystem services due to a multitude of threats caused by unprecedented growth, development and consumerism. Coupled with hunting, the loss of habitat to make way for human land use, particularly for agriculture, urban development and energy production, continue to be major threats. Humans have left ecological footprints such as grazing, encroachment on forest lands, forest fires etc. In the wider landscape, conflicts between development and biodiversity arise. In order to conserve forests, Conservation Reserves have been created and Community Reserves and Management Advisory Committees have been established.

3.1.1. Indian Forest Acts

A number of legal and policy initiatives have been taken to protect and conserve forests and wildlife. These include the forest policies of 1884, 1952 and 1988, which may be due for another revision to keep pace with the changing scenario. The Indian Board for Wildlife was formed in 1952 to provide advice in the field of wildlife conservation. The Indian Forest Act of 1927 (now under revision and redrafting), the Wildlife (Protection) Act of 1972, the Forest (Conservation) Act of 1980 and the Environment (Protection) Act of 1986 are important Central legislations.



3.1.2. Ecological footprints in forests

The ecological footprint of humans in forests is increasing as it includes the biologically productive area or bio-capacity needed for crops, grazing land, built-up area, fishing grounds, roads, residential buildings, dams, eco-tourism and its related activities and allied non-forest activities.

► Grazing

Due to a very high cattle population (450 million), there is a severe shortage of fodder. Cattle are generally allowed to graze openly in forest areas. Even though grazing is prohibited in protected areas, 67% of national parks and 83% of wildlife sanctuaries have reported incidences of grazing. Heavy grazing in forest areas damages trees, destroys herbs, compacts soil, prevents regeneration and introduces diseases among wild animals.

► Encroachments on forest lands

Reliable data on encroachments of forest lands are not available. The Forest Survey of India estimated in 1987 that over 700,000 hectares of forest lands have been encroached. By now, it has increased considerably. Most of the forest area under encroachments is being used for agricultural purposes and construction of resorts and recreational areas. At several places, it has been observed that some encroachments began as a sort of shifting cultivation and then turned to settlement and permanent cultivation. This act has a very devastating effect on forests which get fragmented and mutilated. In the southern state of Tamil Nadu, many educational institutions and organizations in Coimbatore district have encroached upon forest lands and blocked elephant corridors, thus exacerbating human-animal conflict and resulting in the death of many elephants.

► Forest fires

Fires are a major cause of destruction of forest areas. It is estimated that most forests suffer burns annually. Most of the fires in the forests of India are surface or ground fires. Crown fires seldom occur and are more commonly reported from coniferous forests in the Himalayas. Sometimes, ground fires are also reported from forests at high altitudes. Nearly 98% of fires in the country are caused by people. Forests are set on fire by shifting cultivators to induce fresh shoots of grass for cattle and to collect NWFPs (Non-Wood Forest Products). These fires often go out of control and cause massive damage to forest resources.

3.1.3. Biodiversity and conflict

In the wider landscape, conflicts between development and biodiversity arise as a consequence of the over-exploitation of natural resources, bringing about a direct loss of wildlife species and habitats. Equally problematic to biodiversity is the intensification of production systems. In replacing mixed production with monocultures, diverse low input cropping systems are replaced by genetically uniform production systems. Equally damaging to biodiversity are the intensive control measures taken by the modern farming system through the use of hormones against weeds, pests and vermin. Many of these species have useful functions in the ecosystem.

► Resource use conflicts

Growing tensions are evident in many areas in forest fringes among proponents of alternative forms of land use. Disputes typically arise where natural resources are exploited for commercial gain and where biodiversity is perceived to be harmful to the production process. In India, there are growing incidences of conflict between people and elephants, tigers, leopards, sloth bear etc. The causes of the increasing conflict are instructive as with minor modification they can be applied to many other species. Firstly, the intensification of agriculture and its expansion into

areas of land formerly bordering forests have greatly increased the zone of contact between people and wildlife populations. Secondly, the demands on resources of the management authorities in many places have increased, but budgets and staff numbers have declined. Thirdly, the specific reasons why elephants raid crops have not been fully explored, nor have cost effective and non-lethal methods of deterring this behaviour been adequately developed.

3.1.4. Forests of Kanyakumari

Forests are the lifeline, heritage, assets and natural resources of the nation, on which all forms of life depend and thrive. The forests in Kanyakumari district are verdant and virgin and said to be 75 million years old. Of the total district area of 1,67,130 hectares, forests occupy an area of 50,486 hectares which is about 30.2% of the total geographic area of the district, following Nilgiris district with 59% and Dharmapuri district with 38% in the state of Tamil Nadu.

► Kanyakumari Wildlife Sanctuary

Kanyakumari Wildlife Sanctuary with adjacent areas of Kalakkad Mundanthurai Tiger Reserve and Neyyar Wildlife Sanctuary of Kerala state constitute the southern-most tip of Western Ghats, a biological hot spot and a UNESCO World Heritage Site. The natural vegetation of this region represents biomes ranging from southern thorn, dry deciduous, moist deciduous and semi-evergreen forests to evergreen hill sholas with grassy plains. The tract is exceedingly rich in wildlife and harbours a variety of mammals. The avifauna and reptilian and amphibian fauna of this region are also rich and diverse.

In recognition of the tremendous biological potential, Kanyakumari forest division was declared as Kanyakumari Wildlife Sanctuary in 2002 (vide G. O. Ms. No. 152 dated 16.07.2002) with an extent of 45,777.57 hectares. Later, in 2007, Kaani tribal settlements, the approach road to the settlements and the area leased out to the government-owned Arasu Rubber Corporation were excluded from the sanctuary vide (G. O. Ms. No.128 [E&F] dated 20.11.2007) and an area of 40,239.55 hectares was declared as the Kanyakumari Wildlife Sanctuary.

► Ecological significance

The ecological significance of the Kanyakumari Wildlife Sanctuary is of paramount importance. The forests serve as a catchment area for 10 reservoirs namely Pechiparai, Perunchani, Chithar-I, Chithar-II, Upper Kodayar, Lower Kodayar, Kuthiyar, Chinna Kuthiyar, Poigai and Mambalatharu. These reservoirs irrigate an area of about 50,000 hectares and feed about 2,500 ponds and more than 500 km length of channels. The wellbeing of these water systems is closely related to the prosperity of the farmers of the district as the economy of the district depends on agriculture. Hundreds of hill streams collect the rainwater from precipitation in the reserve forest. These streams drain into Kodayar, Paraliyar, Pazhayar and Valliyar.

► Floral significance

The vegetation and flora of Kanyakumari Wildlife Sanctuary are exceptional because of an extraordinary variety of species found within a small area. Kanyakumari Wildlife Sanctuary is floristically one of the richest areas in India harbouring not less than 3,500 species of flowering plants. The IUCN has identified 11 plant species as critically endangered, 12 species as endangered and 21 species as vulnerable. This indicates the fragile nature of the ecosystem and the unique floral diversity of the forest.

► Geomorphological significance

Kanyakumari forests, though small in area, have as many as 14 forest types according to the Champion and Seth (1968) classification (Table 3.1):

Table 3.1. Types of forests in India.

No.	Type of forests	Species
1. 1A/C3	Southern hill-top tropical evergreen forests	<i>Calophyllum elatum</i> , <i>Cullenia excelsa</i> , <i>Hydnocarpus</i> sp.
2. 1A/C4	West coast tropical evergreen forests	<i>Calophyllum elatum</i> , <i>Cullenia excelsa</i> , <i>Hydnocarpus</i> sp.
3. 2A/C2	West coast semi-evergreen forests	<i>Hopea parviflora</i> , <i>Mesua ferrea</i> , <i>Kingiodendron pinnatum</i>
4. 3B/C1(b)	Moist teak forests	<i>Tectona grandis</i> , <i>Pterocarpus marsupium</i>
5. 3B/C1(e)	Slightly moist teak forests	<i>Pterocarpus marsupium</i> , <i>Emblica officinalis</i> , <i>Carreya arborea</i>
6. 3B/C2	Southern moist mixed deciduous forests	<i>Terminilia paniculata</i> , <i>Albizzia odoratissima</i> , <i>Dillenia pentagyna</i>
7. 5A/C1(b)	Dry teak forests	<i>Tectona grandis</i> , <i>Pterocarpus marsupium</i>
8. 5A/C3	Southern dry mixed deciduous forests	<i>Anogeissous latifolia</i> , <i>Pterocarpus marsupium</i> , <i>Wrightia tinctoria</i>
9. 5/DS2	Dry savannah forests	Mostly grasses like lemon grass
10. 6A/C2	Carnatic umbrella thorn forests	<i>Acacia Planifrons</i> , <i>Zizyphus xylopyrus</i> , <i>Cimmiphora caudate</i>
11. 6A/C1	Southern thorn forests	<i>Zizyphus xylopyrus</i> , <i>Albizzia amara</i>
12. 6A/DS1	Southern thorn scrub	<i>Zizyphus xylopyrus</i> , <i>Albizzia amara</i>
13. 8A/C1	Southern sub-tropical hill forests	<i>Zyzygium amottianum</i> , <i>Vitex wightiana</i> , <i>Actinodaphne hookeri</i>
14. 8A/E1	Ochlandra reed brakes	<i>Ochlandra travancorica</i> , <i>Ochlandra brandisii</i> , <i>Ochlandra rheedii</i>

Source: Champion and Seth, 1968.

3.2. The Kaani community

The Kaani hill tribe inhabits the forests of Kanyakumari district in 48 settlements in the Western Ghats at the southern tip of India. The habitat of the tribal people is scattered inside the forest. Traditionally, the Kaani is a semi-nomadic hill tribe which practised shifting cultivation and depended upon the forest for subsistence. They had a high degree of interaction with the forest ecology and its beings. They are an ethnic group with their own unique social institutions and organizations with self-rule, who prioritised harmonious relationships with their ecology through cultural and religious observations and beliefs.

In earlier days, they lived in treetop houses and caves. Now they live in small huts, built with bamboo and wild grass. The walls are made of flattened bamboo and floors with mud. There are no separate rooms in the huts. The hut has a single room, which is called *padi*, *kanikkudi* or *kanipatti*. The hut is devoid of a kitchen, windows, ventilation or a toilet. The floor is made of mud and smeared with cow dung.



Photo 3.1 A Kaani couple in their hut.

3.2.1. Living in consonance with nature

The first thing one notices about the Kaani indigenous people is how they use the natural resources in forests with minimum disturbance. They are nature worshippers and revere the forest and its animate and inanimate inhabitants. They secure their food, fodder, medicines, tools and all other requirements for their sustenance from the forests.

Due to their close relationship with the forests, the Kaani tribe possesses inherent knowledge about animals. The Western Ghats is one of the major habitats of the Asian elephant and the forests in Kanyakumari are considered an elephant corridor. Due to the illegal demand for ivory, elephants often become the victims of poachers. The Indian government is initiating efforts to save the elephants. The Kaani tribal people have an inherent intuition to track elephants. Due to this, the Tamil Nadu Forest Department engages the Kaani tribe in tracking elephants, monitoring their habitat and breeding patterns and vigilantly watching their movements.

3.2.2. Food culture of the Kaani

The Kaani people get their food by harvesting or collecting forest produce and sharing the food among the community. They collect fruits like jackfruit and mango, edible green leaves, mushrooms, tubers and honey. They cultivate coconut, areca nut, banana, pineapple, vegetables and tubers. Tapioca is their staple food but now they find it impossible to grow it as the tapioca crops are raided by wild animals. Deforestation has resulted in less forest space to be shared between the tribal people and animals.

They depend heavily on the monsoon rains for agriculture and do not have any other type of irrigation for crops. If rains fail, they are forced to refrain from agricultural operations.



Photo 3.2 Red banana cultivated for consumption.

The land is fertile, and the people do not use any artificial fertilizer. They do not adopt any pest control. Because their gardens are of a manageable size, large scale attacks by pests – the kind that threaten conventional farms covering vast acres of land – are rare. For common types of garden pests, they use local traditional folk remedies with organic herbal derivatives to keep them out.

3.2.3. Political structure

Earlier the traditional social structure of the Kaani community was that of a highly co-ordinated unit under the control of a tribal chieftain, called the *Mootukaani*. Traditionally, the *Mootukaani* combined the roles of the law maker, protector and dispenser of justice, physician, and priest.

A triumvirate, having a 'head or chief' named *Mootukaani*, a secretary called *Vizhi-kaani* and a physician named *Pilathi*, governed the tribal community administration. The triumvirate administers the community in decision making, judgement, punishment, celebrations, rituals, facing the challenges of natural disasters and attacks by wild animals and maintaining the integrity and cohesion of the community. They solve their own problems, issues and disputes. They do not allow outsiders to interfere in their problem solving nor do they seek their aid. Major decisions are made at the community level.

However in due course of time, the traditional system of governance in the Kaani community has been gradually eroded to a large extent and the role of the tribal chief is only a token one. Their day-to-day activities and system of governance today are linked to that of non-tribal people who live in and around the forest fringes. This system of governance, referred to as the Panchayat Raj system, is based on the principle of devolution of administrative powers to the local village level, dependent on democratic principles and has been institutionalised under the Constitution of India.

The tribe adopts an egalitarian value system. No one claims a superior status, nor does the community allot a superior position to any one based on social, economic, cultural or educational criteria.

The Kaani people are not swept away by the mainstream culture of modernisation and sophistication as the tribal settlements are far away from the din and bustle of city life. Access to a majority of the tribal settlements is not easy, as they are not connected by motorable roads. Many settlements are located beyond dams so that one has to undertake risky travels in water by crossing the dam, followed by steep uphill treks through forest trails. The huts are not established in clusters, but each one is apart from the other.

3.2.4. Material culture of the tribe

The Kaani tribe is a vast repository of one of the rich cultural heritages of India. Their material culture reveals their deep-rooted perceptions of their culture with a distinct identity of the community. They maintain a traditional culture communicated from their ancestors and keep the traditions of their lineage alive. They have learnt the traditional folk technologies and share their treasure of traditional wisdom through cultural transmission processes.



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Photo 3.3 A typical hut of the tribe.

Folklore studies of material culture typically address how objects are designed, made and used, and what they mean on various levels to those who make and use them. Folklorists are also interested in the objects themselves, and in such matters as their shapes and dimensions, the materials from which they are made, their decorative elements, and the variations among different makers and groups, as well as variations over time and place. In general, folklore studies of material culture have favoured handmade objects and craftsmanship itself has been a special focus.

3.2.5. Animistic worship

The existence of the nature, human and spirit continuum is reflected in the life of the Kaani tribe. The living consciousness of spirits in nature allows them to have a different perspective from those of other communities. They believe in the invisible spirit or supernatural powers and refer

to the spirits as deities and have names for them. Animals, ponds, trees, rivers, stones, cliffs or mountains are abodes of spirits. The tribe lives constantly under the watchful eyes of spirits. The veneration of ancestors finds a very vital place in the tribal religious belief with strong faith in malevolent and benevolent spirits. They plant a tree at the grave of the dead and maintain sacred groves in the forests and firmly believe that anyone damaging a tree in the grove will be doomed forever. They perform rituals led by the priest-magician of their clan to avoid animal attacks, to safeguard themselves from animals and to ward off ailments and diseases.

For fertility, they symbolically display cycus leaves (*Cycus circinalis*), *ulathi* inflorescence (*Caryotaurens*), areca-nut bunches, bunches of bananas and tender coconuts.

They strictly believe in the ethics of conservation and are against destruction, disruption and devastation. They maintain certain taboos, for example, the belief that consuming cow's milk would incur the wrath of God as the cow is revered as a sacred animal.

Some specific plants that are considered sacred are grown by the Kaani tribal people in the vicinity of their houses and temples, for example, *Ficus bengalensis*, *Ficus religiosa*, *Mangifera indica* and a host of others.

Rituals have a major role in environmental ethics among the Kaani tribe. They maintain religious or ritual representation of resource management. Before cutting a tree, they perform a *pooja* led by the clan's priest-magician *Pilathi* to the spirits with the belief that they are killing a tree with a life and the spirit residing in the tree should not avenge itself. While constructing a hut with forest wood, they perform another ritual led by the *Pilathi* so that the spirit allows the inhabitants of the hut to live in peace and harmony.



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Photo 3.4 The priest-physician *Pilathi* performing a ritual with his assistant.

3.2.6. Ethical consumption

Religion has a strong role in restraining consumption patterns of the Kaani tribal people such as abstinence from consuming cow's milk. The cow is regarded as a sacred animal in India and extracting its milk as food is a great sin against God. They ask a pertinent question: Is it fair on the part of humans to consume God's milk? They do not consume beef as they believe that eating God's meat is an equally great sin against God. They are not in the habit of domesticating cows. They are meat eaters, but not beef eaters. Most of the Kaani tribal people abstain from consuming wild pork, as wild boar is not a clean animal as it forages in dirt and in muddy areas.

Indigenous traditions closely tied to their bioregions for food, and material resources for clothing, shelter and cultural activities, tend to have their environmental ethics embedded in their views. Ritual calendars are derived from the cycles of nature, such as the appearance of the sun or the moon or the seasonal return of specific animals and plants. Indigenous communities have a very light environmental footprint compared with industrial societies. The Kaani people tenaciously cling to environmental ethics and ecological prudence amidst the current environmental stress to save the rich environmental heritage and biodiversity of the forests.



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Photo 3.5 Kaani girls collect wild cashew fruit.

3.2.7. Linguistic diversity

Any people's language is influenced by the people's physical environment. Conservation biology needs to be paralleled with conservation linguistics. The Kaani community has a dialect called *Malam-pasha* (language of the mountain people) or *Kaani-pasha* (language of the Kaani people). Many of the names of places bear references to biodiversity, such as *Keeri-Paarai* (Mountain of Mongoose), *Pura-villai* (Garden of Dove) and the proverbs also bear relevance to biodiversity, for example, *pannipola urangatha* ('do not sleep like a boar'), *nina-puli-pidichin-athu* ('behave properly, or the tiger will attack you').

3.2.8. Material culture

The objects and technologies required to make the materials of human requirements formed linkages between life and the surrounding environment. The mastery of primitive skills comprises two factors – the method and the technique. The method is in the mind and the technique is in the hands. Method is the logical manner or set of systematic and orderly processes, using a preconceived notion.

It is based upon the obvious premise that the existence of an object created by humans is concrete evidence of the presence of a human mind operating at the time of fabrication. The common assumption underlying material culture research is that objects made or modified by humans, consciously or unconsciously, directly or indirectly, reflect the belief patterns of individuals who made, commissioned or used them, and by extension, the belief patterns of the larger society of which they are a part. The Kaani tribal people live in accordance with the rhythm of nature and secure everything from the forests for their livelihood and material needs. The materials go down deep into their inner recesses leading to a strong communion with nature and a sensed knowledge of their ancestors. The culture is passed on from ancestors to posterity through practical exercises and the present generation acts as culture-bearers.

They use a collected assortment of traditions and technologies with tools. They have created tools and innovations, an inevitable human need for their survival. The material culture refers to the totality of physical objects made by a people for the satisfaction of their needs; especially those articles requisite for the sustenance and perpetuation of life.

A host of such materials are used to drive away wild animals that raid and destroy their agricultural crops. The tools reveal the relationship of the tribal community with the range of environments they face and experience.

The population pressure of people inside the forests by way of rubber plantation workers with their residential quarters, roads and other infrastructure facilities for residential areas, vehicles for transportation of people and materials, hydroelectric power stations, a host of private plantations, research plantations, and unplanned eco-tourism heavily contribute to habitat disturbance of wild animals in the Kanyakumari forests. The human population on the forest fringes also exerts severe stress on forests and they rely on forest resources as they secure most of their needs from forests.



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Photo 3.6 A Kaani tribal person using a bamboo canoe for transport.

3.2.9. Ecological imbalance and human–animal conflict

Owing to ecological imbalance, there is an imbalance in the predator-prey ratio in the wild and population of some specific species of predators such as tiger, panther, hyena, Indian wild dog, small fox, wolf and snakes has drastically dwindled while the population of some prey species such as wild boar, bonnet macaque, sambar, langur, porcupine and hare has exploded. The population explosion of the latter has resulted in severe destruction and wreaked havoc upon agricultural crops.

The current pace of forest land conversion for non-forest activities and monoculture plantations of rubber in Kanyakumari forests deprives wild animals of wild fruits, tubers, wild jackfruit, wild mango, nuts, greens, Naval (*Syzygium cumini*) and Aiyini (*Artocarpus hirsutus*). A high degree of habitat disturbance is experienced by the wild animals and as a result they are forcibly pushed out from their own native habitats in the wild to agricultural areas for foraging and to satiate their food and water requirements.

The prevailing drought conditions, drying of water resources in the interior forests, truant monsoons, the impact of global warming coupled with climate change severely aggravate the human versus animal conflict.

► Tools to combat wild animals

The Kaani indigenous community has traditionally developed many tools to combat wild animals that raid their agricultural crops. Some of the tools to chase out wild animals are listed here.



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Photo 3.7 A tribal person with *Adi-udukku*.

Adi-udukku: This is a piece of bamboo, measuring about three feet with part of the top portion removed (Photo 3.7). Then a cut is made perpendicular to the bamboo. When it is operated manually, one-half moves upwards and strikes the other bottom half, making a noise that scares the animals and causes them to run away from the field. This tool is used to scare away wild animals such as monkeys and squirrels that destroy the crops during the day, and sambar deer that wreak havoc at night.

Kudukkai: This is a piece of bamboo about three feet long with a reaper measuring one foot attached at the middle, tied to a string (Photo 3.8). When the tool is in operation, the attached wooden piece strikes the central bamboo making a noise that scares the animals, causing them to leave the agricultural fields.



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Photo 3.8 A tribal person with a Kudukkai.

Kal-Vil (Stone bow): This consists of a bow with two strings and in between the strings at the middle, they are united. In the strings, for a length of about two inches, there is a rectangular space covered with woven thread, where a stone can be attached (Photo 3.9). Instead of an arrow, a round stone is used. This bow is used to chase away monkeys and squirrels that destroy crops during the day.



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Photo 3.9 Kal-Vil (stone bow).

Nanthini: This is a bamboo tool that serves to eliminate animals from agricultural areas by making noise during the day and at night. It is made of bamboo measuring three feet, where part of the top portion is cut off. Down below, a small area is left and below that an area of one inch is cut off and removed. When the user strikes the top portion with two sticks each measuring one foot, it makes a noise that scares the animals (Photo 3.10).



Photo 3.10 A tribal person with Nanthini.

Participating in the discussion workshop and exposure program on 'ILK and Sustainable Forest Conservation' by the Kaani indigenous people of Kanyakumari Forests, R. Madhavan Kaani, 78, a senior clan leader of Padu-paarai tribal settlement, said that owing to ecological imbalance, the populations of specific species like monkey, wild boar, porcupine and sambar have increased, and these animals destroy all the agricultural crops throughout the year without any check.

C. Appu Kaani, 66, another senior leader of Cherukadathu-kaani settlement, said that the dwindling population of the predator species such as tiger, leopard, hyena and wild dogs and the local extinction of fox and wolf have negatively impacted forest ecology causing an increase in prey population. He called for the proper conservation of these predator species.

P. Sahadevan Kaani, 52, of Chacka-parai settlement detailed some of the traditional knowledge to drive out animals from agricultural fields. He highlighted that the menace and destruction of the various wild animals caused them to refrain from agricultural practices in some of the areas in the forest and depend on the government supply of rationed rice for their livelihood. If the present situation prevails, he feared that the future of agriculture in the community might be in doubt.

S. Kumar Kaani, 48, of Vellambi settlement, said that the wild boar is a great threat to the Kaani people in their farming, that wild boars dig the wet soil and eat away the earthworms. Earthworm is a friend of the farmers and if the earthworm is destroyed, it will result in reduction of the soil wealth and have a detrimental effect on composting of dead vegetative matter.

Mundathi Kaani, 89, of Vellambi settlement, a senior woman advisor of the clan, said that drought, water scarcity, failure and trancy of monsoons as well as forest destruction forced the wild animals to seek food and water in tribal residential areas and destroy the crops. The restrictions of the Forest Department in using forest resources add to the existing woes in their life.

The indigenous people revealed the following ILK aspects during the dialogue sessions.

► Chasing elephants

The Kanyakumari forests have about 72 elephants in seven or eight matriarchal groups. Over the past five years, five people have been killed by elephants and about 20 have been injured.

The Kaani people use stone bow, fire and beating of drums using old tins to make noise to chase the elephants away from their area.

► Sloth bear

Sloth bears, which live in higher elevations, are nocturnal animals that eat their favourite delicacy, jackfruit, and invade the jack trees during the jackfruit season from April to June.

They also eat domestic honeybee nests and the bees. Therefore, the tribal people, who domesticate honey bees, have to keep them at lower elevations and the people residing in higher elevations are not able to keep honey bees. The population of sloth bears is more than 500.

► Wild boar

Wild boar is a perennial threat to the agriculture of the indigenous people and to their residential areas. The population of predators such as tiger, leopard, hyena as well as snakes such as cobra, king cobra and vipers has drastically dwindled, and consequently the population of wild boar has proliferated. Wild boars number more than 30,000. Making noise by sitting on top of rocks using metal tins and packs of trained country dogs to chase the wild boars are the ILK methods for deterring agricultural raids by this species.

► Monkey

Monkeys are a severe destructive threat to the indigenous forest dwellers. They destroy all agricultural crops and invade the huts to take away anything and everything. They make terrestrial and aerial attacks on crops, fruits and all harvests. Their population has registered very high numbers due to ecological imbalance in the predator versus prey ratio. As the population of predators such as tiger, leopard, hyena, fox, wolf, cobra and king cobra has decreased, the prey population has drastically proliferated with a population of more than 30,000.

Using a stone bow, the Kaani people drive out the monkeys. They make a noise using the noise producing tools described above to chase them out from the fields.

They also use dried fish and banana in an earthen pot. The monkey takes the banana along with the dried fish, smells the fish and discards it. It rubs its palm to remove the remnants of the dried fish and tries to get rid of the obnoxious smell by rubbing its palm on a hard, rough, uneven surface such as a tree bark or a rock that causes injury to the palms. Since it experiences physical injury in the palm, the whole group of monkeys will avoid revisiting the area in future.

Alternatively, the top of a tender coconut is sliced open leaving a small hole and it is kept in a place in the agricultural fields that the monkeys frequent. The monkey puts its paw into the coconut to extract the kernel. It may not be successful in the initial attempt and struggles to pull its paw out, thus getting scared and trapping its paw in the coconut. After some struggle, it pulls its paw out and avoids the area for fear of risking an injury to the paw again.

Packs of trained country dogs are also used to chase away the monkeys.

► Sambar and barking deer

Sambar and barking deer invade the agricultural fields at night and destroy the crops. The population of the sambar is about 4,000 and that of barking deer is about 3,000.

To chase these timid animals, a noise is made. Fencing made of thin bamboo and discarded twigs also prevents entry into the agricultural farms. Packs of country dogs are used to chase them.

► Tree top huts

Bamboo huts are constructed on huge treetops to avoid the threat of and conflict with wild animals, especially during the nights. There is every possibility of the wild animals entering into their small, unsafe, unlocked huts and attacking people. Residing in treetops is a safe way to avoid confrontation with wild animals at nights. Presently, the tree top hut culture is vanishing.

► One-leg bamboo ladder

The Kaani people live in tree top huts to avoid conflict with wild animals. A one-leg bamboo ladder with side branches of about one foot is used to reach the tree hut. After reaching the hut, the ladder is taken up the tree. When the occupants of the hut want to climb down, they use it. When any person climbs on a two-legged ladder, there is every possibility of a sloth bear or a leopard following the person by climbing on the ladder. However, the one-leg ladder is not viable for the animals to climb as it has only one bamboo.

► Use of *maadam*

Maadam is a word in Tamil language, meaning a small, low roofed hut. This is made of bamboo and forest wood with roofing made of forest grass and it is usually open on all the four sides (**Photo 3.11**).



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Photo 3.11 A *maadam*.

Usually, it is constructed on higher ground to monitor the movement of animals. In a majority of cases, it is constructed near a rock, so that if any wild animal chases people, they can climb the rock to avoid the attack. People stay in the *maadam* at night to monitor the movements of wild animals with the objective of driving out animals that raid their crops.

3.3. Impacts of ILK on sustainable conservation

The Kaani people help the Forest Department when elephants, sloth bear or any other animals enter the residential villages or forest periphery by chasing the animals using ILK tools. Forest laws are very strict and implemented with a good spirit that supports conservation and the Kaani community sincerely obeys the forest laws and cooperates in conservation activities.

The indigenous people are animists and do not harm the animals. By adopting ILK, crop raiding animals are not harmed and thus the Kaani people help in forest conservation.

The Kaani people serve as informers for the Forest Department. Entry into forests for non-tribal people is strictly banned and any illegal intruder is penalised; this helps to reduce human footprint in the forests, which helps in conservation. The tribal people alert the Department if anyone intrudes into the forest for hunting or poaching or to plunder forest resources.

3.4. Negative drivers

1. As entry into forests is restricted, indigenous people are not able to collect minor forest produce.
2. The traditional way of fishing is banned and they are unable to fish in dams and are thus deprived of their traditional fish food. Dams are leased to outsiders for fishing.
3. As using forest resources is prohibited, they have to buy all materials required for housing and other activities, often travelling to towns far away, incurring costs of materials and transportation which impacts their poor economy.
4. The destruction and devastation of crops by animals deprives the indigenous people of their livelihood and of their basic sustenance that ultimately results in starvation and penury.
5. Global warming and climate change have a severe impact on agriculture through failure and trauancy of monsoons, water scarcity, drought conditions and by the constant crop raids by wild animals.

3.5. Suggestions

1. The Kaani indigenous people can be encouraged to grow alternative crops that are not invaded by animals.
2. Alternative job opportunities can be created with self-employment schemes.
3. Eco-tourism can be promoted: for example, boating, trekking and supply of indigenous traditional, organic food to eco-tourists at dams with the permission of the Forest Department.
4. Agriculture can be promoted by having proper fencing for protection from wild animals.

5. The Kaani tribal people can be made partners in conservation along with the Forest Department and NGOs.
6. Apiary and banana plantations with adequate protective measures can be promoted for their livelihood and to raise their economy.
7. Herbal gardens with nurseries that accommodate plants that are not raided by animals can be promoted as a commercial venture to boost their economy.

The Kaani tribe is inevitably facing gradual transition in all aspects of life. The forces of globalisation, free trade and the present communication revolution are making indelible impacts on their lives. The impact is felt more severely on the younger generation who are not interested in their culture. Acculturation and cross-culturalisation occur now. Consequently, erosion and dilution of traditional ethics and values espoused by their ancestors is observed, and this is why documentation of the culture of the Kaani community is vital. It is suggested that their pristine culture be documented to record a rich repository of cultural heritage of an indigenous community in India.

3.6. Documentation of indigenous knowledge and benefit sharing mechanism

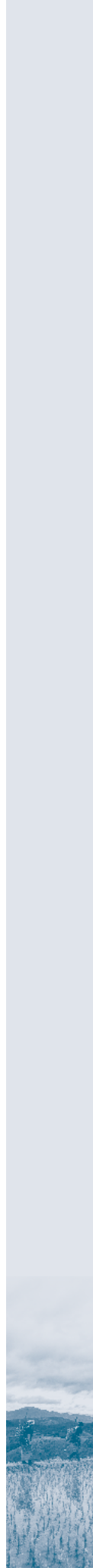
The Kaani indigenous community is aware of the anti-fatigue properties of the Arogyapacha plant, *Trichopus zeylanicus* ssp. *Travancoricus*, which they eat during long treks in the hills. The tribal physicians have knowledge of ethnobotany and they pass it on to the next generation through oral transmission.

In 1987, a team of botanists came across this herb, when they went for a field survey in the forest in the Western Ghats, when members of the Kaani tribal community accompanied them. The team observed that the tribespersons ate some fruits that kept them energetic and agile; the team members were later offered these fruits during arduous trekking and upon eating them, they experienced renewed energy and strength. The team asked them about the source of the fruits, and after much persuasion and assurances that the information would not be misused, the Kaani people finally showed them the fruits.

Later, Jawaharlal Nehru Tropical Botanic Garden and Research Institute (JNTBGRI) produced a scientifically verified and standardised herbal formulation for its reproduction by crushing the plant's leaves and combining it with three other plants. JNTBGRI named this formulation *Jeevani*, which means 'giver of life'. The product is available in the form of granules and is mixed with hot water or milk.

With an interest in helping the Kaani people through a benefit-sharing agreement, Dr. Pushpangadan wanted to secure financial gains for the Kaani people. The committee chose a pharmaceutical company based in Coimbatore, India, to be the primary manufacturer, and in 1995, they signed a seven-year licensing agreement with JNTBGRI.

Recognising the rights of traditional knowledge holders can make a significant impact on economic and social development. Intellectual property (IP) protection is one of the most important tools through which this recognition can come. Even before the patent applications based on Arogyapacha were granted, they yielded strong financial gains, half of which was shared with the Kaani people. As this case reveals, the effective use of IP with benefit-sharing agreements can help to foster development for traditional knowledge holders and their communities.



Conclusion

Documentation of ILK will help the Kaani community get recognition in society. Strengthening of the traditional institutions is highly necessary as presently they are being swept away by the concepts of globalisation and communication revolution. Capacity building is vital as the Kaani indigenous community is far away from the mainstream society owing to the distance, hilly terrain and dense forests, specific culture, ban of entry into the forests for common people, low level of literacy, severe poverty, low status of economy and language barrier.

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