district were interviewed, covering different age groups.

The study revealed that only 31% of the population possesses traditional knowledge. However, 30% of them do not use medicinal plants for treatment of day-to-day ailments. Nearly 69% of the surveyed population was unacquainted about the use of these plants. Only 1% of the surveyed population practised TK to cure various diseases. The herbal practitioner charged a nominal fee or nothing for the treatment of diseases and this practice never formed part of their main income. Irrespective of gender, the age group of above 40 years was found to be the custodian of TK (84.93% male and 65.75% female) compared to the younger generation (15.04% male and 16.44% female). Out of 31% of TK-holder respondents, only 23% had taught the next generation about herbal remedies and only 8% of the new-generation (up to 20 years) respondents showed willingness to retain and use this knowledge.

This clearly proves that knowledge about medicinal plants in these regions is vanishing. Depletion of such an important source of knowledge is a big loss for a country like India. Documentation of the uses of haldi, neem and basmati in our classical traditional healthcare system (e.g. Ayurveda) and to a certain extent in traditional folklore has helped India retain patents of these plants. Thus, documentation of TK helps in protecting unconventional mode of knowledge and so it is equally important to conserve it along with medicinal plants. At the same time, the livelihood of traditional healers should be taken care of. As mentioned above, practising traditional healthcare was not a primary source of income; there was increasing ignorance about the whole healthcare system. Nearly 60% of the respondents mentioned that they do not have any interest in using herbal medicines, as it is painstaking to find, prepare and use such medicines, apart from restriction from government on wild harvest of some plants. About 15% of the respondents mentioned that availability of modern medical facilities plays a major role in depletion of TK, whereas 19% of the respondents pointed out the unavailability of medicinal plants in nearby forests.

Nowadays, rural life is changing into fast life of modern cities. This change is affecting the young generation and overall increasing willingness to use allopathic medicines over ethnomedicines for its faster effect. Though the respondents shared that the process of collection of medicinal plants is time consuming and tedious, it was observed that villagers were more interested in selling these medicinal plants instead of using them for self cure. But, this trade is more or less in the informal sector and so difficult to document.

Changes in agricultural practice were evident from the fact that locals preferred cash crops like soybean, rajma, potato and tomato over medicinal plants. Local needs and micro-socio-economic–environmental conditions of knowledge holders and of medicinal plants should be considered to formulate policies to conserve both traditional knowledge and the plants.

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Religious taboo among the tribes of West Kameng – an excellent traditional system of conserving biodiversity

Conservation of natural resources by traditional societies across the globe seems to have arisen out of the age-old practice of animistic religious belief systems. Such belief systems are fundamental aspects of people's culture, which strongly conditions their use of natural resources[1]. Arunachal Pradesh, a biodiversity hotspot region in the eastern Himalayas, is a tribal-dominated state with 26 major tribes and 110 ethnically distinct sub-tribes[2], where more than 80% of the population is from the rural area and is directly or indirectly dependent on the surrounding forest resources for its livelihood[3]. Besides these, the forest is also an integral part of the local people, which fulfils their cultural and social needs. This reliance has created an indivisible bond between the ethinic communities of the state and the natural resources.

Monpa and Sherdukpen, two ethnic groups of the West Kameng District, have managed and conserved the biodiversity of their surrounding since time immemorial. Subsequently, they have developed their own folk culture, customs, beliefs, faith, tradition, taboos, etc. For them, conservation of biodiversity is not an isolated, compartmentalized concept, but an integrated part of their lives. These two tribal groups are not only familiar with the economically important plant species in their surrounding forest, but have also good knowledge of religious and cultural values of plant diversity. Many plants like *Gymnocladus assamicus*, *Rhododendron* spp, *Quarcus* spp, *Daphne papyracea*, *Thuja occidentalis*, *Manihot esculentum* and *Illicium griffithii* have been conserved in their natural habitats through their deep knowledge of beliefs, faith and taboos. They worship nature and consider many of the forest patches as sacred groves. Almost adjacent to all the villages of the Monpa and Sherdukpen tribes there is a sacred grove (Figure 1 *a*). These sacred groves vary in size from a few trees to dense forests covering vast tracts of land and have been protected by the tribes through generations. Each sacred grove is dedicated to local deities and nobody is permitted to cut plants or kill animals or any form of life. To protect these forests the ancestors of the two tribes have made specific sets of rules and regulations enshrined in religious or cultural beliefs and superstitions, and all

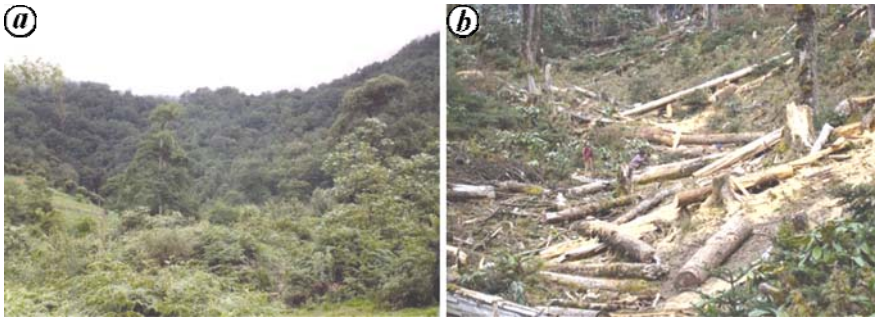

Figure 1. ***a***, A sacred grove conserved by the local people in Bomdila. ***b***, A destroyed forest in Naga-GG.

members of the community obey it. These sacred groves are under the vigilance of the village panchayat/council controlled by the headman. If anyone is found violating the rules, the village panchayat/ council will take action, which includes a large penalty and in some cases the accused may be debarred from certain religious ceremonies. For good harvesting of agricultural products, good health, pure potable water, etc., the villagers make offerings annually to the deities whom they believe to be residing in the forest. Although there is restriction, collection of forest products such as fallen leaves, few fruits, fallen twigs, etc. is allowed only during specific seasons. Besides these, there are also many forest patches near the Buddhist monasteries which are conserved by the lamas of the Gonpa authority. Many of these are made up of forest patches which are relics of past virgin forests and contain some important species such as *Taxus wallichiana*, *Gymnocladus assamicus*, as well as species that have disappeared from regions outside the grove.

Although these two ethnic groups contribute a lot to the conservation of biodiversity through their traditional ways, in recent times with rapid modernization to cope with the expanded population, many forest areas have been destroyed (Figure 1 *b*). Therefore, it is important to involve the tribal communities of Arunachal Pradesh in formal biodiversity conservation strategies and encourage them to protect and expand the sacred groves through their cultural and religious beliefs.

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Commercial revegetation of *Kappaphycus alvarezii* along Indian seas

Macroalgae are considered as ecologically and biologically important components in marine ecosystems and play a key role in overall coastal biodiversity. The macroalgae act as a microhabitat by providing nutrition and shelter to a variety of invertebrate groups. The epifauna provide a potentially important trophic link between fish and primary producers such as the host seaweed with its associated periphyton and phytoplankton from the surrounding water. Seaweeds are under threat in developing countries, where they are being disturbed by a variety of human activities. The direct introduction of seaweed species for aquaculture is an important vector, especially in the tropical regions[1]. Commercial cultivation of *Kappaphycus alvarezii* was started in 2003 along the Tamil Nadu coast. The ecological threat from *K. alvarezii* to coral species in the Gulf of Mannar (GoM) was first indicated by Pereira and Verlecar[2]. The Central Salt and Marine Chemicals Research Institute, Bhavnagar as a responsible national laboratory that introduced *K. alvarezii* in India, is continuously monitoring the environmental impact of its large-scale cultivation and necessary surveillance mechanisms to keep in check its rate of encroachment over other native flora[3]. Bioinvasion of *K. alvarezii* on branching corals (*Acropora* species) in the Kurusadai island (GoM) was reported by Chandrasekaran *et al.*[4]. However, Mandal *et al.*[5] asserted that the invasive potential at Kurusadai island is remote taking into account the lack of functional reproductive cycle, low spore viability and absence of microscopic phases in the algal life cycle coupled with the abundant presence of herbivores.

The proliferation of non-indigenous *Kappaphycus* may lead to habitat alteration in a particular region due to the breaking up of a single vegetation type into smaller intact units. Altering habitat and involuntary spreading of farmed algae to nearby areas may affect many components of natural communities[6]. This concern centres on the disruption of the once large continuous blocks of habitat into less continuous habitat and conversion of vegetation from one type to another. Seaweeds provide a habitat for myriad invertebrates and if native seaweed cover were to be entirely lost or recolonized with introduced species, this could be detrimental[7] or even beneficial to associated invertebrate epifauna and to larger invertebrates and fish that feed on seaweed-associated epifauna. The impact of non-indigenous seaweed on epifaunal assemblages depends on the host-plant specificity of the organisms and the similarities between native and non-native seaweeds[8]. Most of the previous studies have shown that the introduced seaweeds reduced the native macroalgal abundance, thereby negatively affecting the epifaunal diversity[9]. However, invasive seaweed may also provide more space for the epifauna and increase secondary production in the coastal systems[10]. Addressing these concepts in an intertidal study system, it is mandatory to test how *Kappaphycus* influences the associated