Traditional Foods of Monpa tribe of West Kameng, Arunachal Pradesh

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Learning about edible plants, processing of foods and medicine using location specific wisdom and conservation of food related resources has been in the large part due to incremental and cumulative learning among the societies living in close connection with nature. Looking to the importance of location specific traditional knowledge in processing of foods, a study was conducted among Monpa tribe of Thembang and Dirang circle of West Kameng district of Arunachal Pradesh. Data were collected using the participatory and conventional tools. The study demonstrates that Monpa tribe prepares a range of alcoholic beverages from finger millet (Eleusine coracana Gaertn.), maize (Zea mays Linn.), barley (Hordeum vulgare Linn.) and rice (Oryza sativa Linn.). Traditional foods are mainly based on yak milk, soybean (Glycine max Merrill.), buckwheat (Fagopyrum esculentum Moench), Amaranthus, maize, barley, chilli and various indigenous of fruits and vegetables. The foods consumed by Monpa tribe are nutritionally rich and are compatible with their ethnicity. The variability in the altitude, diversities in the socio-cultural and ecological edges affect the preservation, selection and use pattern of ethnic foods. The types of foods used in daily diet also signify the knowledge and learning network of women, governed by many institutions like mila, lakpa & barter system and elders of society. Diversities in the culturally and nutritionally important foods have made possible the conservation of indigenous biodiversity. Social gathering and cultural occasions provide opportunity in sharing the foods and learning the related knowledge systems.

Keywords: Arunachal Pradesh, Beverages, Biodiversity conservation, Ethnic foods, Fermentation, Monpa tribe, Traditional Foods

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Humans living in close proximity to their environments are capable of observing, identifying, monitoring, and reacting to variations in resource availability, ecological relationships, food access and use, and biological responses to particular circumstances¹. Such knowledge can be acquired in the same way as other important knowledge for survival, such as of food and medicine. Learning about edible plants, processing of new foods and medicines, and how to prepare and process them safely and effectively, has been in large part incremental and cumulative among the societies living in close connection with nature1,². Just feeling sick from eating a small amount of a plant, or detecting a bitter taste (e.g. eating Solanum khasianum C. B. Clarke emend. Sen Guptafruits for first time) or some temporary hallucinogenic effect, would have been sufficiently remarkable to engender further experimentation or trial or to ward off more intensive use, and latter on reaching to the point of its rational use in food, nutritional security and curing several diseases³⁶. This type of experience is the very mechanism whereby people learned to differentiate between food and medicine. Furthermore, observations leading to ecological understanding can be positive, just as tasting and learning about certain foods can be a positive experience⁶ and also an important approach to understand the types of ecological relations and food access patterns of a particular community⁵.

Arunachal Pradesh is considered one of the richest botanical regions in India, where people depend much on shifting cultivation and forest based food products for their food and nutritional security. The state is rich in traditional foods and beverages and methods of processing various forest and agricultural products by the tribal communities with their rich experiences. Different beverages and fermented foods are used in various combinations with traditional beverages for the food and nutritional security⁵. A diverse
Methodology

Arunachal Pradesh, the land of rising sun, is situated in the Northeastern tip of India between 26°.28' and 29°.31' North latitude and 91°.30' E and 97°.30' E longitudes. It comprises of mountainous and sub-mountainous portions of the Himalayan system in its extremity, covering an area of 83,743 sq km. This state is skirted by Bhutan in West, Tibet and China in North and Northeast, Burma in East and Assam in South. It is the largest state area wise in Northeast region of India. Barring only 12 towns, entire area is rural where an overwhelming 94 % of its population lives scattered in 3257 villages grouped under 48 integrated development blocks. The state is divided into 16 administrative districts, of which West Kameng is one. The name of the district is derived from the Kameng river, a tributary of Brahmaputra that flows through the district. The district lies between 91°30' to 92°40' East longitudes and 26°54' to 28°01' North latitudes. The Bomdila subdivision of the district is divided into three circles, namely Dirang, Bomdila and Thembang. These circles are predominantly inhabited by Monpa tribes, who are Buddhists by religion with close cultural and religious affinities with Bhutanese and Tibetans. The economy of Monpas is basically agrarian and rural based. They practice both permanent and shifting (Jhum) type of cultivation. Maize, paddy, millets, buckwheat, wheat, barley, soybean, French bean, chili, potato, cabbage, cauliflower, apple, etc. are some of the major crops grown by Monpa tribe.

To achieve the objective of study, Thembang and Dirang circles of West Kameng district (Fig. 1) were selected based on the ethnicity, dependency of local people on natural resources. To understand better and get reliable information, the help of local guide was taken throughout the study. From each circle, 4 villages (total 8) were selected for conducting this study. With the help of village extension worker and Gaon Burha (GB), list of potential knowledge holders (women and men both) were prepared and selected randomly. Thus, from 8 villages, total 120 women and 40 men respondents were chosen. The women were interviewed about collection and processing of foods, while the supplementary information pertaining to the types of vegetation & animals and their relationship with the ecology, agriculture, animals and food systems, were obtained from men. The Focus Group Discussion (FGD) was adopted to discuss the complex issues like processing variations, methodology of traditional foods preparation, sources of collection of indigenous materials, etc. of unique traditional foods. The intention was to develop a consensus result for further analysis and interpretation of data. Participant observation was major tool to record the methods of preparing rakshi and lohpani from barley and maize. For the welfare and equitable

knowledge system exists among Monpa women to prepare the fermented foods, boiled foods, beverages and nutritionally rich traditional foods from various indigenous crop plants, forest products and meat of wild as well as domesticated animals. These foods form integral components in day to day food package and diet, and at different socio-cultural and spiritual occasions. These fermented foods are not only rich in nutrients and but have also certain curative properties against many diseases and disorders. There is often little differentiation between the traditional foods and medicines consumed by various tribes of Arunachal Pradesh. Traditional food is used to maintain the good health and traditional medicines to cure some diseases like diabetes, high blood pressure, malaria, jaundice, diarrhoea and dysentery. The Monpa tribe of Arunachal Pradesh are non-vegetarian in food habit and prepare many non-vegetarian traditional foods from various sources like fish, crab, pork, yak, duck, chicken, hunted wild animals and different insects collected from river and forest. The new generation of Monpa community has undergone significant changes in their diets over the past 30 years due to intervention of modern crop varieties, materialistic life and current trend towards the increased use of commercial processed foods. For tribal people around the world, traditional food use transformation has been radical, as people have moved, often over the course of a single lifetime, from a diet in which the majority of nutrients drawn from local food, to more generic diet of store-bought food, most of which are produced and processed for away from locality and even prepared in metropolitan cities.

Introduction of fast foods through globalization process, accompanied by decrease in the use of traditional foods of local tribe has resulted in many diseases most notably diabetes, heart disease and stroke, and other disorders.

This study demonstrates the exploration of varieties of nutritionally and culturally important ethnic foods and its future prospects among Monpa women of West Kameng district, Arunachal Pradesh.
share of benefits (monetary and non-monetary) and ensuring the protection of traditional knowledge, it was the ethical duty of authors to take the Prior Informed Consent (PIC) of studied women and men, and women to maintain the ethics of preserving the knowledge systems of its property holders. In case of knowledge was the part of public domain then consent of community leader was taken (Fig. 2). After taking the ensured consent of knowledge holders, the data pertaining to this study have been processed for this publication. The agreements of majority (96.0 %) have confirmed with the help of their relatives and GB that information of this study can be put in the full disclosure under public domain. With the help of frequency, percentage and mean data were analyzed, and inferences have been drawn from the study.

Results

*Monpa* tribe consumes a range of solid, semi-fermented, fermented, boiled and process foods apart from the nutritionally rich and medicinally important beverages prepared from indigenous maize, barley, finger millet and rice varieties. These foods and beverages are given below:

Ethnic beverages

Any alcoholic beverage is called *Yu* in Dirang *Monpa* dialect. The alcoholic beverages prepared by *Monpa* tribe are *themsing*, *rakshi*, *mingri*, *lohpani* and *bhangchang* of which *themsing* is of best quality followed by *rakshi*.

*Themsing*

It is prepared from *kongpu* (finger millet) or *bong* (barley) or mixture of both. *Kongpu* gives low yield but high quality of *themsing*, whereas when *bong* is used alone or in combination with *kongpu* gives high yield of *themsing*. *Themsing* looks like black tea and has a good aroma.

The grains of finger millet or barley are cooked and taken out. These are spread on the bamboo mat or polythene sheet on the floor. Small amount of *pham* [yeast tablet made of indigenous rice paste and leaves of *Solanum khasianum* (Fig. 3)] is mixed thoroughly with the cooked grains. *Zarsi* is smeared inside the *zom* (special wooden container for preparation of *themsing*) before keeping the cooked grains in it to avoid development of foul smell. Then whole mixture is kept in the *zom*. The paste is covered with leaves of *zola* (*Brassiopsis* sp.) or banana (*zola* is more preferred), over which a thin layer of wooden ash is spread. Then, whole container is made airtight. Small pipe is fitted at the bottom of the container and packed with yak *ghee*. The container is kept undisturbed for 1-3 yrs. It is used in curing certain disease like waist and muscles pain, and added as an ingredient in formulation of certain local medicines. These medicines formulated with local beverages (*rakshi* and *lohpani*) and given in the delivery, stomach pain, dysentery and *chhatpa* (a syndrome affecting people of cooler region when they go to hotter places). Only rich *Monpa* tribe can afford it, because of its high price.

*Rakshi*

*Rakshi* is an alcoholic beverage prepared from barley, rice, finger millet or/and maize. These grains are cooked till becomes soft and spread on bamboo mat (*charang*). Yeast tablets (*pham*) are added to the lukewarm seeds covered with plastic sheet and kept for 2-3 days to begin fermentation. These grains are cooked in an aluminum container having special arrangements by which the *rakshi* is extracted by distillation. It looks like distilled water.

*Mingri, lohpani* and *bhangchang*

The grains of maize, rice or barley are cooked till becomes very soft and are spread on bamboo mat (*charang*). Yeast tablets (*pham*) are added to the lukewarm paste, covered with plastic sheet and kept for in a container for fermentation. After one week, the light yellowish beverage obtained is called *mingri*. The remaining paste is allowed for further fermentation and *lohpani*, yellowish beverage obtained is comparatively of lesser strength than *mingri*. The remaining paste is again allowed for further fermentation and is squeezed after 4-5 days to extract *bhangchang*, which is of the lowest quality among the traditional alcoholic beverages.

During the process of its preparation, precaution is taken to avoid direct touching by hand. For its preparation and processing, a wooden spatula, called *Cchok* is used while *Khajir* (bamboo made sieve) is used for filtering *mingri* and *lohpani*. The remaining paste after extraction of *mingri* and *lohpani* is squeezed to obtain *bhangchang*. *Mingri* and *lohpani* are generally consumed by middle class people and mostly prepared from local maize varieties. White in colour, *bhangchang* is used by poor people. The residue after preparation of *mingri*, *lohpani* and *bhangchang* are given to cow, goat, horse, sheep and pig after addition of common salt, and is considered
good for health as well as to increase the milking efficiency.

Precious foods among Monpa tribe

Precious foods are those, which are offered during special cultural and social occasions and are given only to special guests. In these foods, local paneer, dry meat of yak, solu krepu (dried boiled green chilli), blue green algae [(rimom), called chhilap (Chhi means water) in Tawang Monpa dialect], ghee and chhurpi (paneer from yak milk) are more popular among the rich people. The processes of preparation of some of these foods are described as below:

Shya Phrum Rimom

Shya means meat, phrum means paneer and rimom means blue green algae. The boiled meat is added to solu (chilli), rimom and chhurpi and cooked on low flame for few minutes, and fresh yak ghee is added just before taking out. This is served with kongpu (finger millet) flour or local rice.

Chhurpi

The presence of chhurpi in Monpa house is an indicator of social status. According to its age chhurpi is of three types, i.e. Chhur singba, Chhur chirpen and Chhurpupu.

Chhur singba

The fresh chhurpi is known as chhur singba or chhur mingba. It is the paneer like product made from yak milk after fermentation of milk by adding the extract of crab apples (thung).

Chhur chirpen

The yak milk is boiled (Fig. 4) and the cut fruits of thung (crab apple, Fig. 5) are added to the lukewarm milk to facilitate the fermentation. After some time, the water is removed and remaining material (Fig. 6) is placed in cotton cloth and kept for 3-4 days till its turns into creamy-yellow in colour. Then, it is pressed with stone to give proper shape and kept on a bamboo mat placed over the fireplace in the kitchen (Fig. 7). Gradually the creamy yellow colour of the chhurpi turns into light yellowish brown in colour (Fig. 8). This is known as chhur chirpen. It is tastier than chhur singba. Mixture of chuur chirpen, ghee and solu krepu goes well with any flour and rice.

Chhurpupu

The chhurpi, which becomes very old (4-5 yrs) is called chhurpupu. The chhurpi is kept in yak skin (mongnang) and after sealing can be kept for 3-20 yrs (Fig. 9). Chhurpupu is more priced and is culturally valuable to Monpa people. Sometimes it is used for curing stomach pain. A small quantity (about 5-10 gm) of chhurpupu is taken and mixed with the beverage made of indigenous barley or finger millet, and then given to the person suffering from stomachache. Some dishes are made of chhurpupu, of which Marchang is quite popular.

Marchang

Chhurpupu is fried in yak ghee to remove the unpleasant odour, and then kongpu flour is added to it and mixed properly. This dish is known as marchang. Ghee and chhurpupu is mixed in old seasoned rakshi and is given to cure bodyache.

Soybean (libi) Chhurpi

Soybean chhurpi is prepared during the winter, i.e. from October-February, when problem of housefly is comparatively less. To prepare this, local varieties of soybean seeds are boiled and spread on charang (bamboo mat) after draining out the water. Salt is added to the seeds when still lukewarm and mixed properly. The drained water is not thrown, it is used for malicing on skin for curing cracks during winter. The drained water can be preserved only for 1-2 days. After cooling, the seeds are put in Shong and covered with leaves of Zola or banana. After putting the lid, the container (Shong) is kept near fire and is rotated regularly. When smell comes and seeds become thread like, they are taken out, crushed carefully and spread in small heaps on charang and sun dried. Again, it is crushed and dried. Crushing is done three times. The prepared chhurpi can be stored in dried bottle gourd or bamboo containers for 1-4 yrs.

Chhurpi chutney

For preparing the chutney of chhurpi, desired quantity of soybean chhurpi is taken and crushed with ripe tomato, solu krepu, shjappe (Allium spp.) and mann (Allium spp.) and made into paste (Fig.10). This is eaten with momo or other maize and barley based ethnic foods. The poor people are accustomed to utilize the chhurpi of soybean (Fig. 11) for preparing variety of local dishes.

Yak meat

Yak meat is most precious meat for Monpa people living in the temperate zone at varying altitudes. They often preserve the surplus amount of meat by drying
it. After making into small pieces, meat is dried in the sunlight (Fig. 12) and is stored in large wooden boxes.

**Putang**

The grains of *meetha phaphad* (buckwheat) are sun dried and made into coarse powder using indigenous water run flourmill. The chaffs are removed and the coarse powder is made into fine powder. The finely grounded powder is kneaded with cold water to make a paste of suitable consistency. Otherwise, it will break. *Ghee* or oil is added in a hot container. Water is added to boil. The kneaded paste is made into noodle like structure using an indigenous wooden made instrument called *putan chirising*. These noodles are boiled in water. When the noodles come to the surface of the vessel, they are taken out and dried under sun. These dried noodles are known as *putang*. The assembly used for making *putang* is called *putang chirising* and is made from a special wood. Various dishes made of *Putang* are:

*Putang thukpa*: *Chhura* (paneer made from soybean), *soul krepu* and dry meat of yak or dry fish are mixed and made into curry (*sabji*) using *ghee*. *Putang* is added to this curry when it is near to ready. This is known as *phutang thukpa*.

*Putang khazi*: The chutney made of red ripe chilli (*soul*) is mixed with soybean *chhura* and the mixture is crushed. To eat this, leaves of *naran*, *shijape*, *mann*, *lai patta* and *dhangshung* (boiled and dried) are added and boiled for some time. The dish thus prepared is known as *khazi*. *Khazi* is served with *putang*. This is called *putang khazi*. *Putang* is served hot otherwise on cooling it becomes sticky and paste like. The digestibility of *Putang* is poor; hence only healthy people eat it. It is recommended against diarrhoea. *Putang* made from *teeta phaphad* (buckwheat) flour is prescribed against measles, typhoid, stomach pain and for maintaining the health of old and weak people. *Chhurpupu* and *soul krepu* are made into paste using hot water and served with *putang* (made from *teeta phaphad*).

**Teeta phaphad* (buckwheat) flour

Leaves of *teeta phaphad* are used [fresh or shade dried (Fig. 13)]. The vegetable made of green leaves of *teeta phaphad* is given frequently to the diabetic person and patient suffering from gastric trouble. Several dishes of dried leaves of *teeta phaphad* are made after adding it with the dried local fishes. The flour of *teeta phaphad* is made into paste after adding cold water, cooked and eaten by old people along with chutney.

**Yak fat**

In olden days, the yak fat was used as *ghee* for the preparation of *chapati* made from *phaphad*. *Spreading yak fat made chapati* on a big hot stone using *sibsa* (a wooden handle used for turning the *chapati*). Using the yak fat with the *rakshi* is very common among *Monpa* tribe during the winter season, which supplies instant energy (Fig. 14).

**Ethnic foods made from maize grain**

**Khrangpa**

Maize grains are crushed into small pieces (rice grain size) in hand *chakki* or water *chakki* (water mill). The chaffs are removed and small size grains are known as *khrangpa*. *Khrangpa* and *meetha phaphad*/*teeta phaphad* grains are wetted for few hours and made into paste, and cooked slowly on low flame. This cooked dish is known as *khrangpa khuri*, which is given to old people (without teeth) along with soybean *chhurpi* and green chilli chutney. For rich people, *khrangpa khuri*, chutney and *sabji* are served separately, and pieces of *shijape* root are added to improve the taste. For poor people everything mixed together and is given to eat.

**Kakun**

The semi-matured cobs of local varieties of maize are taken and grains are roasted in the iron pan. The roasted seeds are transferred into stone made *okhal* (a utensil made of stone for crushing and pressing the grains). The roasted grains are pressed gently with wooden handle, *Musul*. The lukewarm pressed seeds are then cleaned and are called *kakun* (Fig. 15). It is one of the popular ethnic food and eaten with the dried fruits of *amre* (*Diospyrus* spp., Fig. 16) during the *Losar* festival. It is also eaten with walnut fruit.

**Ethnic foods based on berries**

It is interesting that in Dirang valley, *Monpa* people have not only conserved a range of indigenous food crops but also the local fruits, vegetables and spices. The local fruit crops are either conserved in the community forest or have been domesticated by the rural women for ensuring the sustainability. This includes raspberry, local peach, pear, *Solanum khasiamum*, kiwi fruit, etc. The women have developed the experience over the period of time to
utilize these resources in their daily diet for ensuring the nutritional security. For example the raspberry [sirsong (Rubus ellipticus Sm.)] is used for making certain local dishes. The matured fruits of sirsong are harvested by women either from forest areas or kitchen garden and the juice is extracted. After sieving, juice is mixed with the flour of indigenous maize, barley or wheat to make the chapati soft and tastier. The chapatis are then smeared with yak ghee and are eaten. This is most often offered to the old aged and weak person.

**Other ethnic foods**

**Solu krepu**

Fully matured green fruits of solu (chilli) are dipped in boiling water and are taken out when colour changes to creamy-white and dried in charang [(bamboo mat) (Fig. 17)]. If solu is dried on aluminum sheet, black spots will appear which decreases its market value. Solu krepu is stored in bamboo container, because it provides aeration and minimizes the fungal attack. It is used for making varieties of foods and most preferably given to the lactating mother after delivery, due to its less pungency. Monpa tribe does not give any red meat to the mother just after delivery, because of its low digestibility. Only dry meat of yak is given after cooking and making it soft with solu krepu. Beside this, fresh yak ghee is boiled, cooled and mixed with kongpu flour or rice and given to the women immediately after delivery. Dry meat of yak and chuurpupu (old seasoned chhurpi, i.e. local paneer) added with solu krepu is also given after one week of delivery.

**Salt tea**

The fresh yak ghee is used for the preparation of salt tea. 1-2 yrs old yak ghee is preferred to be taken with rakshi and lohpani. The boiled water is put into the specially made wooden cylinder and after mixing the salt and yak ghee, it is diluted and mixed properly. Now this salt tea is ready to drink, which keeps the body warm and provides energy during the cold. The old seasoned ghee is not used in salt tea preparation, as it does not mix well with water and produces an odd smell. With the passage of time, the value of salt tea among newer generation has reduced due to cultural erosion and socio-political change.

**Mula sya shijape kamtang**

It is a gravy curry (sabji), which is served during Losar festival. It is prepared by boiling together the yak meat, solu krepu, radish, shijape root, ghee and chhurpi.

**Khapse**

*Bundangmo* (Amaranthus) seeds are used in making a variety of ethnic foods like khapse and sathu. The grains of bundangmo are dried, roasted and made into flour. The flour is kneaded with lukewarm water (difficult to knead in cold water). It is made into eight-shaped rolls and fried in mustard oil till becomes crispy. This is known as khapse and it can be stored for one year in a well-aerated bamboo container. Bundangmo is a precious crop for Monpa tribe and is conserved by the women. But, with the passage of time and due certain anthropogenic factors and inappropriate Government agricultural policies the area under bundangmo has drastically reduced over the years. Now a days cultivation of this crop is found only in few remote villages. Hence, its economic value in the market has increased by 4-5 folds.

**Gasinpipi/ Pokpokpa**

*Bundangmo* (Amaranthus) grains are dried, roasted and made into flour. The flour is kneaded and rolled into the shape of chapati and cut into pieces in star shape. They are partially dried in charang (bamboo mat) under diffused sunlight. These are roasted (without oil) and known as gasinpipi (in Namsu and Thembang) or pokpokpa (in Dirang and Sangthi).

**Kakun Naka Yalen**

Soybean and pea seeds are dried, roasted and crushed partially. The chaff is removed and the partially crushed grains are mixed with gasinpipi, fruits of amre, dried chip of apple, peach and kakun and served during losar. This dish is known as kakun naka yalen.

**Bong**

During pilgrimage, the bong flour (barley), dry chilli powder, chhurpupu powder, chhurpi and salt are mixed together in hot water and consumed. Salt, ghee and water are kept in one bottle and the other powdered food items are kept separately. Bong seeds are considered as the sign of prosperity and are the integral part of any puja. While inaugurating a newly constructed house, the bong seeds are spread on the floor before entering in the house. The seeds are filled in penza (a precious wooden utensil) and kept in the room.
Fig. 1 Location map of study area

Fig. 3 Pham tablets prepared from rice paste & S. khasianum leaves

Fig. 4 Yak milk mixed with Thung extract

Fig. 5 Fruits of thung

Fig. 6 Chhurpi just after separation kept in the bamboo container

Fig. 7 Chhurpi after pressing kept near fire place in kitchen

Fig. 9 Two years old Chuppi in Yak skin

Fig. 10 Chutney of chhurpi (of yak milk), tomato and solu krepus

Fig. 2 Community leader Shri Lobsang of Dirang from where PIC has been taken

Fig. 8 Late Mrs Pem Dolma demonstrating the one year old chhurpi of yak milk
Before taking to watermill for making flour, the bong seeds are roasted in fine hot sand. The roasted seeds are slightly crushed in okhal and winnowing is done to remove the chaffs. These cleaned seeds are mixed with the roasted bundangmo seeds powder for making sathu. Sugar is added to this to improve the taste. The Monpa women consider sathu as a precious and nutritious food.

Chhoktor/Chhoktorma

It is a laddu, which is an integral part of every puja (worship) of Monpa tribe. Flour (bong/meetha phaphad) is kneaded with ghee and made in the shape of mango. This is painted with red colour paste. For painting, the tip of yak tail is used as brush.

Torma

Different shapes of idols are made of bong flour. Torma are painted and used in puja by the Lama (Buddhist priest) for curing someone who is sick or to do away with evil spirit. After puja the idols are thrown at a tinali (intersection of three crossing roads).

Momo

It is one of the popular ethnic foods of Monpa tribe. The flour of indigenous barley is made into fine powder in water mill and sieved to remove the husk. Local chilli (solu), lai saag, mann (Allium spp., Fig. 18) and shijape (Allium spp.) are taken, washed and made into small pieces. After putting the yak ghee into frying pan, the garlic (Monpa lehsun), chilli and onion are fried till becomes light maroon. Then all the greens are fried in this for a while and taken out from the pan. The flour of bong (barley) is kneaded and fried greens are put inside this. After making into onion shaped balls they are steamed and this is called momo. It is eaten with the chutney made of local chilli, Monpa lehsun (garlic) and mann. This momo is preferred most by vegetarian people. Momos are also made from pork and yak meat. Instead of putting greens inside the momo, the pork and yak meat is put and steamed for non-vegetarian people. It has now become commercial food and can easily be available in restaurants. Nevertheless, instead of using indigenous barley flour, people now a days are using maida, which is comparatively poor with regards to fiber percentage and other nutrients contents. The knowledge systems and materials (ethnobotanicals and traditional utensils) for momo preparation have also undergone change over time.

**Cultural relation of ethnic foods**

The society, culture, traditions, ethics, ecology and food habit of any community cannot be seen in the isolated mode, because all are intermingled together and their interactions are very complex. The ecology provides a range of probability to select the plant and animal sources for food, while culture decides the tradition and ethics of a particular society what to eat, when to eat, how to eat and how to preserve the related natural resources. The reported foods of this study are made not only from crop plant sources, but also from forest products, semi wild plants, animal products (both domesticated and wild). The protocol of each food varies from other, mainly on the basis of processing method and types of preservation. Varying culture with the changing altitude of ecology of even same community determine types of access and ways of conservation of plants and animals used in ethnic food system. The traditions maintained by various cultural and social institutions of Monpa community are having strong ethical base while harvesting the plants and animals, and deciding the consumption pattern of foods. The philosophy of Monpa indicates that either plant or animal should not be plucked more than the need. To ensure this, various cultural and social institutions like Fla and Chhopa were created by ancestors of Monpa community in which community participation is necessary for learning about natural resources and ensuring the sustainability of whole ecosystem. These institutions not only ensure the equitable share and sustainable use of natural resources, but also help in the intergenerational and inter-and-intra-communal transfer of knowledge systems codified in local language, through different rituals and ceremonies. It is only the cultural ethnics of Monpa tribe, which decides to neither harvest/kill the animals and fish nor eat any related foods in certain days of month. The caste hierarchy system of Monpa tribe also plays a pivotal role in accessing and killing the animals and fishes for eating purposes. This helps in avoiding the overexploitation of food resources. To signify the relationship of caste system, use of food and sustainability, a local farmer Mr Jambe Tsering, Dirang Bazar, Dirang, West Kameng has stated that:

“Certain caste among the Monpa tribe has been given responsibility to kill animals for meat and do fishing. They are responsible for supplying the fish and meat to the whole community. Otherwise if everyone is killing animals and fish, it will directly
affect the overall sustainability of biodiversity and natural resources”.

The contribution of women in selecting the plants for growing, domestication and conservation for food purpose cannot be underestimated. It is the women of Monpa community, who are conserving range of different vegetables like *Allium* spp., bean, cucumber, wild raspberry, pear, star anise, tubers and mushrooms for use in different traditional foods. Besides, the conservation of crop plants and ethnobotanicals in indigenous kitchen garden, preserve the surplus animals’ product like meat and fat of yak, and sheep are conserved. The surplus amount of yak meat is first dipped either in finger millet or rice rakshi for about 1-2 hrs and then sun dried. This practice is more reliable and appropriate for the safer preservation of yak meat as perceived by Monpa women. These examples indicate women’s wisdom for ensuring the year round food security. The ethnobotanicals and local crops are not only the source of food and nutritional security but also play a major role in the household economy.

Identification, deciding the edibility, neutralizing the bitter taste and processing of plant based foods to make it tasty and nutritious needs years of experiential wisdom. It is the women in Monpa community who look after the domestic work, do agricultural operations, collect foods from forest and nurture the children. The Monpa women primarily do the collection, grading, networking with the market and selling of these ethno-products. All the food products whether it is forest based or agricultural and animals based are processed, and sold in the local market through the informal rural social institution called Lakpa. This philosophy of Lakpa is to reciprocate each other for reducing the burden, drudgery and time in the food cultivation, collection and processing of crops. The Lakpa also provide an opportunity to share the knowledge and experience related to foods and natural with each other in the Monpa community, thus making a knowledge network in the society to meet out the day-to-day’s food, nutritional and economic needs. The knowledge of Monpa women in meeting the food security and sustaining subsistence economy are the best source of learning and making the hypothesis for food and policy research. There is need to learn from these women and incorporate their wisdom in planning the participatory food and natural resource management programme.

### Discussion

From foregoing learning with Monpa tribe of West Kameng, it can be concluded that the food habits are basically decided by the ecology, religion and cultural ethics. Close living and interaction with ecosystems and philosophy of life buffered by socio-cultural dimension significantly lead to the incremental learning about foods. The food selected and consumed by Monpa is not the result of one year or decade; instead, is the cumulative experience based on trial and error gained from the time immemorial. While selecting and processing a particular food, the women consider many factors like food habit of whole family, resources available with them, duration of cooking and preservation, nutritional properties of recipes used in foods, customs and health of different age group of family. The types of plants, meat, etc. used for preparing the foods vary according to the altitude. For example, towards the Bomdila town of West Kameng district, the use of leafy vegetables in preparation of ethnic food *momo* is not as much as it is in the Dirang and adjoining areas of neighboring Tawang district. It is because of the leafy vegetables like *mann*, *shajjpe*, and other temperate local leafy species are found more at higher altitude under sub-temperate and temperate zone (from 1830-3660 m msl). These gaps of plants availability with varying attitude are managed through the barter system. Based on the limitations and problems, people exchange food materials along with knowledge in the codified languages from lower altitude to higher altitude for ensuring food and nutritional security. It is resultant of ecological edges and vegetation cover variability. The ways of transfer and preservation of knowledge related to ethnic foods vary on account of diverse language and altitude variations even in the same community living in different places.

The experience indicates that, even with the changes that have occurred due to materialistic life, the traditional values still are very much in existence among Monpa tribe living in remote villages. In almost every tribal community there are people who still know and understand the traditional values of ethnic foods and beverages. The deterioration in diet experienced in tribal communities has many diverse causes and influences, like environmental, political, social and structural. Nutritional and cultural value of the ethnic foods, and their close relationship to environmental health should be well recognized.
Honouring those individuals particularly the women in the community who devote their time, energy and knowledge to food and health promotion is also a positive and effective action not only to preserve the institutions who nurture knowledge but also for intergenerational transfer of wisdom and food based culture. It can be promoted through organizing the recipe contest in the villages and honouring the best performer. This approach will facilitate in developing the knowledge network among different groups and inter- and intra-communal social domain. Rewarding and acknowledging young people who demonstrate interest and awareness in the health of the environment and in their traditional foods and medicines would also raise the profile of these issues. This can be initiated through various educative programmes like biodiversity contest among rural children and discovery learning in the forest taking the youngster with elder of society. There should be focused efforts to promote traditional food systems within rural communities, and to facilitate and accommodate local food procurement. This issue can be correlated with the mid day meal scheme for the school children of the Government of India. Schools can facilitate learning from elders within the context of the school curriculum, and can promote experiential learning by inviting the elder of society for lecture and discussions about ethnic foods and related activities. The traditional knowledge holders can also provide an understanding to the school children and students about nutritional and medicinal advantages of traditional foods.

Traditional feasts, community dinners, restaurants, sports, tournaments can all provide opportunities to promote and exchange food products and knowledge about ethnic foods. Now these days, cartoons and video games are more popular and preferred by children, hence they can also be used as means of teaching and learning for children and youth to transfer the wisdom of traditional foods and culture of a particular society. All food resources are complex needs special knowledge to prepare, and need to be protected and monitored at a range of scales. Local women have often been excluded in planning, policy development and decision-making in relation to their resources in Arunachal Pradesh. Women have also often been prevented, legally or in practice, from accessing their traditional food from forest (by making reserve forest), river, lakes or ponds; or from managing it as they have done in the old days. Where this exclusion still exists, policies and regulations must change to be more inclusive and should follow bottom-to-top approach of development. Incorporating traditional food more fully into peoples’ diets today will have to be done through a number of different approaches that incorporate food security, provide for conservation and restoration of food supplies, enhance peoples’ resilience and self-determination, and provide for appropriate education for all of us, indigenous and non-indigenous, young and old alike, about the links between diet, lifestyle, culture, environment and health and well-being.

There is still much scope to know about the health effects, medicinal and therapeutic properties of certain foods. How these foods complement each other, in what ways their use pattern and effects on metabolic activities may be genetically determined to understand the mystery of foods. How can communities and institutions best respond to environmental, social and lifestyle changes and ensure that people still retain their resilience and a positive, healthy cultural identity? Some communities like Monpa tribe of Arunachal Pradesh have managed such change more effectively than others, so what are the components that have made the difference? What role can individuals, community and institutions take in responding to, accommodating, and in some cases, resisting change and restoring previous cultural elements as desired? Collaborative and participatory community based research can provide at least some answers to these questions.

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References
6 Singh RK & Sureja AK, Centurion women and diverse knowledge systems, Indian J Traditional Knowledge, 5 (3) (2006), 413–419.
7 Singh RK & Sureja AK, Dynamics of traditional knowledge and prior informed consent of conservators of indigenous biological diversity of Northeast India. In: UGC sponsored National Seminar on Nat Res and Tribal Comm in North Eastern India from 7-8th February, 2006, Jawaharlal Nehru College, Rajiv Gandhi University, Pasighat, Arunachal Pradesh, India, 2006.
13 Singh RK & Sureja AK, Biodiversity Contests: An innovative method to make knowledge dam and conserve biodiversity, Nat sym on chang con of foreestry in 21st century, held at Dr. Y. S. Parmar University of Horticulture and Forestry, Nauni, Solan, Himanchal Pradesh, India from 21-22nd October, 2005.