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Traditional Costumes of
Leh-Ladakh



Traditional Costumes of
Jammu & Kashmir



Traditional Costumes of
Himachal Pradesh



Traditional Costumes of
Uttarakhand

ENVIS Newsletter

Vol. 19 (2), 2022

“Lifestyle for Environment”

Dedicated to



Shri Narendra Modi Ji
Hon'ble Prime Minister of India

The friend, philosopher and guide to all the global citizen of the world to whom he gave the mantra of LIFE- “Lifestyle for Environment”.

ENVIS CENTRE ON HIMALAYAN ECOLOGY

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(An Autonomous Institute of Ministry of Environment, Forest and Climate Change,
Government of India)



A global initiative on "*Lifestyle for Environment*" was launched by the Prime Minister, Narendra Modi on 5th June 2022. The idea was introduced during the 26th UN Climate Change Conference of Parties, COP-26 held in Glasgow

in 2021. The vision of the global initiative is to live a more natural life in harmony with all living creatures on the Earth. The idea promotes a more responsible and environment friendly lifestyle that focuses on optimum utilization of natural resources and reduce destructive consumption.

We need to awaken our conscience and choose a lifestyle that impact our surrounding minimally and provide space for every living thing to live better. The practical philosophy is of minimalist approach to life. The mantra is not hard to practice. We need to watch what we eat, how we travel, what we wear and how kind we are to other living thing on the planet. We as Indian should be proud of our rich cultural heritage that already teaches us to live healthy lifestyle and protect environment.

The ENVIS Newsletter on Himalayan Ecology, volume 19(2) is dedicated to the mantra "*Lifestyle for Environment*". We have received a overwhelming response to our call for articles from across the Indian Himalayan Region (IHR). In this Newsletter we are showcasing only four articles received from the Northern Himalayan states of Ladakh, Kashmir, Himachal Pradesh and Uttarakhand. We are compiling the huge number of articles received in the forthcoming ENVIS Bulletin which we hope to publish in a couple of weeks.

We have dedicated this Newsletter issue to our Honourable Prime Minister who inspires us to build a better world order. The article from Kashmir describes traditional method of fishing called "Shadow Fishing" and the authors emphasize that "*nothing can replace the thrill of carrying on ancestor's tradition despite the laborious nature of the technique*". In the second article the author describes "*Ramdana*" literally translating "*the lord's grain*" or "*The grain gifted by God*". The author describes a traditional crop of Uttarakhand "*Choulai (Amaranthus)*" which has huge nutritional value and describes its ability to prevent and cure many diseases. The author is trying to draw the attention of the masses to cultivate and popularize this crop to make the society more healthy and happy. The third article documents the traditional sanitation technology of Ladakh "*Sanchot*". As water scarcity increases and soil fertility decreases with every passing day the "*Sanchot*" is a water efficient technology that can save water and improve soil fertility. The fourth article describes the traditional agriculture system of Himachal Pradesh which is highly scientific and helps in ensuring food security in the light of climate change. We have also showcased the colourful traditional attires worn across the states of the Indian Himalayan Region.

The articles will inspire one and all to live better. Signing off by quoting the Father of The Nation, Mahatma Gandhi: "**Be the change that you wish to see in the World**". Suggestions are always welcome to improve the Newsletter.

Paromita Ghosh
ENVIS, Coordinator

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INDIGENOUS TO THE KASHMIR VALLEY, THE ART OF "SHADOW FISHING" HAS PERSISTED FOR GENERATIONS

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Despite the fact that "fishing" may appear to be a term that does not need to be defined, the fact that nearly 38 million people participate in the activity each year-the vast majority of whom are recreational anglers as opposed to commercial fishermen-suggests that there may be some value in exploring what the term actually refers to.

The activity known colloquially as "fishing" can be technically described as the practice of catching wild fish or other aquatic species from waters, and can be done for a variety of reasons including as a means of subsistence, for financial gain, or for recreational purposes. The activity of catching fish for the purpose of eating them, for the fun of catching them, or for both is known as recreational fishing, in contrast to the practice of catching fish for the goal of selling them in commercial fishing. There is evidence to suggest that early people began fishing approximately 40,000 years ago. Cave paintings and other types of archaeological evidence suggest that seafood was a significant part of the ancient human diet. These types of evidence include shell pieces and bones of fish that were discarded.

The environment of the Kashmir valley has traditionally been semi-closed but is gradually becoming more accessible in both space and time. The Jhelum river is, as it has been throughout the history of the system, the most important component. Jhelum did, in fact, bestow its gift upon Kashmir. It is born from it, made up of the debris brought down by its various tributaries such as the Sindh, Liddar, Vishav, Dudhganga, Shaliganga, Pohru, Erin, and Madhumati rivers; and it is united with it through every fiber of its being by sticking to the valley floor. The natural configuration of the encircling crest has a tendency to reinforce the closed character of the system and has operated as a major limitation on the processes of the system opening up. This tendency has tended to strengthen the system through time. The state of Jammu and Kashmir is often referred to be a paradise on earth since it has an abundance of water resources, including lakes, rivers, glaciers, and groundwater. These water resources can be found in the form of torrential cold-water streams, lakes, rivers, springs, and high-altitude lakes. These bodies of water are home to a diverse array of fish species, providing ample opportunity for locals to harvest fish for consumption and commercial use, thereby sustaining themselves economically. Shadow fishing, also known as "Tchaai Gaad" (Shadow Fishing) or "Tchay-e-Gard Shikar" is an age-old practice in the valley that has been passed down orally from generation to generation. This is especially true of the people who make their homes in the catchment areas of major lakes like Wular Lake, Dal Lake, Manasbal Lake, and others.

According to Kashmiri poet and historian Zareef Ahmad Zareef, the shores of the old lake used to be lined with dense stands of willow trees, behind whose shelter the fish would seek sanctuary during the summer, making it easier for the local fishermen to catch them. In Kashmiri waterways, particularly in Anchar Lake in Srinagar's Soura neighborhood, fishermen use a regional method to catch fish. It is a method in which fishermen hide in the corner of a wooden boat under a heavy blanket. This casts a shadow on the water, attracting

fish, and then enables them to catch the fish. This technique involves fishermen hiding their harpoons-long, slender instruments with a pointed end-under their clothing or makeshift awnings at one end of wooden boats. Fish continue to swim below the surface of the water because of the cold, but they search for food in shady locations. This fishing method has been practised since the turn of the twentieth century. This time-honoured technique for catching fish from bodies of water, like Anchar Lake, is especially helpful for fish catchers in the winter, when the majority of locals cook fish because of the bitter cold.

Considering that fishing has been a common activity for so long. For the inhabitants, it serves more as a form of culture and amusement than as a means of support. The government must make efforts to protect and preserve this culture. Nothing can replace the thrill of carrying on an ancestor's tradition, despite the laborious nature of the fishing technique.



Fig.1. A typical representation of the shadow fishing operation in Anchar lake (Source: Aman Farooq/GK)

CHAULAI (*AMRANTHAS*): A TRADITIONAL BARANAJA CROP OF HIGH ALTITUDE HIMALAYA REGION, UTTARAKHAND

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The farming system in the Himalaya region is a complex production system interlinked through crops, livestock and forests. The terrace farming is the lifeline of the Himalayan people. Terraces carved out from mountain slopes, sometimes with more than 50-degree inclination, cover 85% of total agricultural land. Of this, 60% is largely rain fed, while valleys, covering 15% of the area, are irrigated (Ghosh and Dhyani, 2004). People cultivate various varieties of cereals, millets, pulses, oil seeds and pseudo-cereals. Most of the varieties grown in the Himalayan areas are landraces adapted to the local environmental conditions.

The Uttarakhand state is one of the mountainous states where almost 71% inhabitant depends on rainfed agriculture, practiced through terrace farming on hill slopes. People of the state developed various practices of agriculture such as Sari system, Baranaja, integrated pest management practices, use of cow dung and shaded plant leaves as compost, different methods of field preparation for the different crops (Maikhuri *et al.*, 1997). In the state various traditional crops are cultivated various grains (cereals and millets), there is usually mandua (finger millet), ramdana/chaulai (*amaranthus*), kuttu/ogal (buckwheat), jowar (sorghum) and makki (corn). Pulses and beans include rajma, lobia, bhatt, gehat, naurangi,

urad and mung. Oilseeds like til, bhangjeer, sann, bhang and vegetables like ogal, kheera, lobia are also grown.

Chaulai (*Amaranthus*) is one of the traditional baranaja crops (baranaja meaning ‘twelve grains’ in the baranaja system, there is intercropping of twelve, or sometimes more, crops. Cereals, lentils, vegetables, creepers and root vegetables are grown in this companion planting system) (Ghosh and Dhyani, 2004).



Fig.1. Chaulai (*Amaranthus*) A traditional Crop of Himalaya region

The plant species *Amaranthus* (*Amaranthus*) is best known as *Ramdana* — droopily translated as ‘the lord’s grain’ or ‘the grain gifted by god’. It grows in abundance between the altitudes of 1,000-3,000 meters in the Himalayan region. It is a fast-growing, vigorous annual plant with an erect stem that is usually moderately branched. It grows from 50 - 150cm tall, rarely to 250cm, the main stem terminating in a large branched inflorescence. It grows best in areas where annual daytime temperatures are within the range of 21 - 28°C. It prefers a mean annual rainfall in the range of 800 - 2,300mm. It is generally, cultivated for its edible seed and leaves for vegetables and grown under natural conditions without the use of pesticides in high altitudes of the Kumaon & Garhwal Himalaya.



Fig.2. Cultivation of Chulai in Doni village, Gharwal Himalaya region

It provides a high-quality protein, with a nearly perfect balance of essential amino acids, including abundant lysine and methionine which is not found in most grains. The grains of

chaulai contain 12 to 17% protein high in lysine which is a vital amino acid. Amaranth has the highest calcium content among cereals and is rich in iron and vitamin B-17.

Health benefits of Chaulai (Amaranth) leaves

Good source of vitamin A, vitamin C, B-17 and folate, thiamine, niacin, and riboflavin

Good source of minerals eg calcium, iron, potassium, zinc, copper, and manganese

Regular consumption reduces blood pressure and cholesterol levels.

Improve antioxidant level & Strengthen immunity.

Drinking 15-20 gm cholai juice reduces swelling in eyes due to heat, reddishness and improves eyesight.

Drinking Cholai juice purifies blood and removes toxic substances from the body.

Use on Ethno-medicine - Amaranths leaves & grain have traditionally been part of the staple diet of the hill folk. *Ramdana* was a veritable *ramban aushadh* (a panacea of cures), alleviating piles, reducing the misery of eczema, providing relief in colic and acting as a diuretic. Boiled Amaranth leaves were applied as a poultice to reduce painful swellings, and at times, even to manage snakebites and scorpion stings.

Importance on livelihood & Income generation: it is a good source of income of local people, the *Ramdana Ladoo* is well known & famous in local market, the price of Rs. 40 per 100 gram & the seed is selling in Rs. 150 per 500 gm in local market.

Way forward

Promoting it's cultivation: The local NGOs, institutions, govt. department should need to be promoting to local community for its cultivation and also provide some tools & seed storage facilities in village level.

Enhance the market linkage & value addition: The Govt. dept, local NGOs, Institutes should need to be facilitation on GI tagging (Geographical Indication) of this crop so that, its market value can be enhancing in globally.

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DRY TOILETS: A TRADITIONAL ECO-FRIENDLY PRACTICE FOR WASTE AND WATER MANAGEMENT IN LADAKH

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Ladakh situated in the trans-Himalayan region of India is considered as a cold desert due to its extremely dry and cold climatic conditions. In the region, nearly 70% of the population in practice agriculture in dry, cold, and less productive climatic conditions (Acharya *et al.*, 2012). The region faces sub-zero temperature for nearly half of the year with an average

annual precipitation of 150 mm (Brazel and Marcus, 1991). Moreover, heavy snowfall and erosion of the topsoil makes the agriculture land less productive in the region. Unlike other parts of the Himalaya, the livestock is very less in the region thus traditional practice of improving soil fertility using farmyard manure is not a common practice. Low temperature in winter, less water availability for irrigation, and unfertile soils with poor water holding capacity in the region thus makes agriculture challenging which has resulted in evolution of traditional practices to cope with such difficulties.

To improve the soil fertility, the local communities have traditionally been using organic manure processed from human excreta (Night Soil). The communities use a traditional toilet called as *Sanchot* which is a dry and water-free toilet. The toilet consists of a two-floor structure with two small rooms constructed one above the other constructed usually with mud bricks. The room at the ground acts as a secret a pit and composting chamber whereas the upper room acts as the sitting place of the toilet with an open toilet seat at the center and a mixture of organic material consisting of soil, litter, dung, leaves etc. which is locally called as *Saa*. After every use of the toilet, the excreta are covered with the mixture of organic material which helps in prevention of the foul smell as well as degradation of the night soil. After a few years of the degradation of the human excreta with other organic material, the dry manure is transported to the agricultural fields for manuring to enhance the soil fertility. The manure from traditional dry toilets has been well proven to be highly propitious for the non-nutritive soil of the region. Night soil including urine and feces is a rich source of nitrogen, phosphorus, potassium, and organic material with low level of heavy metals thus can act a high-quality manure (Jonsson *et al.*, 2004). A study conducted by (Borker *et al.*, 2022) on fertility parameter of different organic matters show that night soil is comparatively better in its quality foe soil fertility as compared to animal dung and organic composts (Table 1).

Table 1. The fertility parameters comparison between Night soil and Organic compost

Compost	Moisture (% dm)	Total Organic Carbon (% dm)	Total Nitrogen (% dm)	Total Phosphate (as P₂O₅), (% dm)	Total Potash (as K₂O), (% dm)	C/N ration
Night Soil¹	52.02±1.3 1	15.40±2.9	2.94±0.32	0.56±0.03	1.81±0.06	5.24±0. 8
Organic²	15.0-25.0	16	0.5	0.5	1	20.1

The dry toilets in Ladakh have traditionally been used to cope with extremely low temperature (-10 to -30⁰C) during winters which freezes the water in pipes, tanks, and open natural sources. Further, given a very less annual precipitation the water availability is also very less in the region. Thus, design of the dry toilets is suitable for conservation of water both in summer and winter seasons. Additionally, the local communities use the mixture of decomposed human excreta and organic matter as manure to enhance soil fertility which solves the problem of fecal waste as well as soil manuring. (Gondhalekar and Akhtar 2013) reported that 67 % of households in Ladakh use traditional dry toilets whereas 28 % use a combination of dry toilets and flush toilets in the summer season. However, in winter, 91 % of households use dry toilet particularly due to freezing of the piping systems of flush toilets. Use of traditional Ladakhi dry toilet is an eco friendly practice for management of fecal waste and water which shall be seen a model example of community adaptation towards the climate change resilience. However, despite various advantages of traditional dry toilets in Ladakh, the practice has some limitations like delayed degradation of fecal and organic matter due to

low ambient temperature and a foul odor. Thus, focused research and development activities are required to enhance the degradation process and reduce the foul odor of the fecal matter through use of suitable microbial agents in the extreme low temperature environments. Ladakh has its inherent advantage and strength in adopting organic agriculture practices. Considering the same, the Union Territory of Ladakh has recently launched Mission for Organic Development Initiative (MODI) with an objective to transform the existing agriculture into complete organic farming. Use of traditional dry toilets and their promotion at large scale in Ladakh will prove instrumental in achieving the goal of organic farming in addition to its significant contribution in fecal waste management and water conservation.

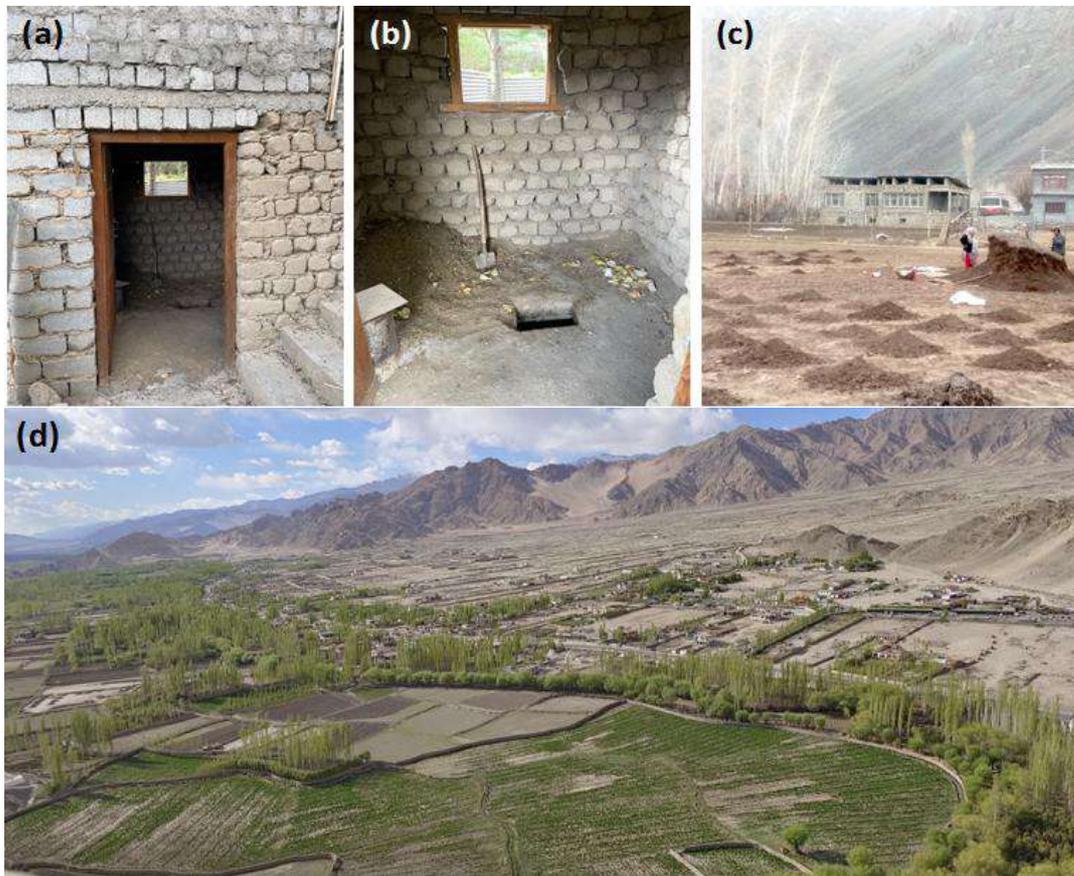


Fig.1. An outline of the traditional dry toilet in Ladakh depicting (a) Building (b) Inside view of toilet (c) Manuring in agricultural field and (d) Agricultural landscape of Ladakh

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TRADITIONAL AGRICULTURAL SYSTEM: A SCIENTIFIC METHOD TO ENSURE FOOD SECURITY IN LIGHT OF CLIMATE CHANGE

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An agricultural system consists of various elements that work together to grow crops and raise livestock for the purpose of obtaining food from the available resources. Such agricultural systems were developed by indigenous peoples over thousands of years of trial and error practices that were tailored to their climatic, geographic, and nutritional needs. This system is chiefly dependent on the traditional knowledge system of the people, basically promoting the use of local equipment, natural resources present in the local vicinity, organic fertilizer, and the cultural way of life of the farmers. Traditional agricultural practices are unique depending on the region from which they originate. Agricultural practices in the district of Kullu of Himachal Pradesh are more or less similar for all the villages in this area. The traditional agricultural system consisted of elaborated processes including various components of natural resources present in this region. Conventionally, millets, pseudo millets, pulses, oilseeds, vegetables, and spices were the chief crops grown by the people, which were mainly for self consumption. The crops mainly consisted of two types of seasonal crops, which were kharif crops, having a growing period from April to October, and rabi crops, which were sown in October and harvested in the month of April. The major crops of kharif season were Chinopodium (*Chinopodium* spp.), Paddy (*Oryza sativa* L.), Maize (*Zea mays* L.), Finger millet (*Eleusine coracana* Gaertn.), Foxtail millet (*Setaria italica* (L.) P. Beauv.), Amaranth (*Amaranthus viridis* L.), Buck wheat (*Fagopyrum esculentum* Moench), Praso millet (*Panicum miliaceum* L.), Soybean (*Glycine max* (L.) Merr.), Kulth (*Macrotyloma uniflorum* (Lam.) Verdc), Black gram (*Vigna mungo* (L.) Hepper), Kidney beans (*Phaseolus vulgaris* L.), green gram (*Vigna radiata* (L.) R. Wilczek). The major rabi crops were Wheat (*Triticum aestivum* L.), Barley (*Hordeum vulgare* L.), Oat (*Avena sativa* L.) Mustard (*Brassica campestris* L.). The vegetables which accounted for largest number of traditional crops were grown in both the seasons of kharif and rabi. Mixed cropping was practiced in the traditional cropping system in which more than one crop was sown in a field at a particular time.

In kharif crops following combination were grown together (Maize+ amaranthus/ common beans/ black gram), (paddy+ foxtail millet), (Soyabean+ amaranthus+ millets), (potato+ common beans), (finger millet+ chinopodium). For rabi crop, combination of (wheat+ mustard), (lentil+ wheat) were grown. The three main characteristics of these farming techniques were mixed cropping, rotational farming, and integrated farming. Integrated farming, or mixed farming, is an approach in which each component sustains the other without much external input.

Traditionally, the farmers reared livestock, which used to provide manure for agricultural fields while the fields provided the livestock with crop residue, which was fodder for them. Other than livestock, indigenous bee rearing was an integral part of agricultural practices. The

bee hives (Madhams) were placed in houses or near agricultural fields, which helped farmers to get good crop production with a valuable by-product in the form of honey. The ploughing was done with traditional equipment made up of wood and iron, with the help of an ox. The other farming practices were done manually and were labor-intensive. No use of chemical fertilizers was made during agricultural operations. The crop, mainly cereal crops and pulses, after harvesting and sun drying, was stored in large wooden boxes known as "datha" by the people. The cereal for utilization in the form of flour was ground in traditional water mills known as "gharats" by the farmers. Hence, the complete agriculture system was based on resources available locally and was self-sustainable. The only limitation of this system was limited crop production, which could only meet household demand. Only a very few crops produced enough surplus to be marketed as a cash crop, which could help farmers earn money. The traditional agriculture system is not efficient enough to sustain the food demand of millions of people, jeopardizing the food security of the country.

The traditional farming system is more than just a lifestyle-based system; it is a complex system with methods based on scientific principles. The traditional farming system is an environment-friendly system with sustainable advances. In long run, this system can prove to be effective in fighting climate change and to retain food security for the people. Three main components of this system i.e., integrated farming, crop rotation and mixed farming make this system robust in mitigating the effects of climate change on food crops. The integrated agricultural practices help in enhancing productivity, saving energy, increasing input efficiency, reducing waste production etc. (Rehman, 2018). Crop rotation employed in this farming is based on mainly two schemes i.e., deep-rooted and shallow-rooted crop system and secondly on cereal and pulses crop system. In fields having deep-rooted crops such as maize successive crop sown was wheat or barley which was having shallow roots. This was to maintain water and nutrient content of the soil (Gan *et al.*, 2015). The second pattern of growing pulses such as legumes like peas, beans etc after harvesting of cereals such as wheat, barley was done. This cropping system is effective in restoring nitrogen content and fertility of soil, and to increase productivity of crop (Gan *et al.*, 2015 and Maikhuri *et al.*, 1996). The multiple or mixed cropping system is very beneficial as it serves as insurance against crop failure, decreases in crop diseases, pests, surface runoff, and helps in increasing soil fertility (Lithourgidis *et al.*, 2011), which are the main problems associated with climate change.

Some of the traditional crops are being encouraged at the national level for their enhanced production in order to maintain the nation's food security; millets are one of these crops. Because the crops in the Himalayan region as well in other parts of the country are rain-fed and mostly reliant on seasonal rainfall for growth, millets play a significant role in the cropping system in traditional farming. Therefore, it is being promoted in a number of states across the nation to increase the production and nutritional content of the food. Government of India is taking many such initiatives to promote millets as climate-smart crop for sustaining food security due to extreme weather events caused by climate change. The Prime Minister of India has recently launched 35 climate-resistant, nutrient-rich crop varieties that will be able to resist extreme weather events and will be equally nutritious. These crops also included some varieties of millets and pseudo-millet, such as pearl millet and buckwheat. Some of the other initiatives included Integrated Cereals Development Programmes in Coarse Cereals, ICDP-CC based Cropping Systems Areas under Macro Management of Agriculture (MMA). Initiative for Nutritional Security through Intensive Millet Promotion (INSIMP) is a part of the Rashtriya Krishi Vikas Yojana (RKVY), Rain-fed Area Development Programme (RADP) is a part of the Rashtriya Krishi Vikas Yojana (RKVY). With an increase in climate change's effects wild biodiversity is in danger of being extinct, but agro-biodiversity will also suffer as a result of unpredictable weather events. So, it is imperative to promote such an

environmentally friendly technology as soon as possible. Such programmes are in their early stages and will require additional efforts and participation from farmers and the government in order to be successful in the long run.

Our predecessors left us a priceless legacy in the form of their valuable expertise in traditional agriculture, which not only helps us grow food for ourselves but also maintains natural balance. The development of a new agricultural system has been ongoing in response to the shifting demands of humanity, although it is not as self-sufficient in the long run. The environment cannot support such activities because the same environmental circumstances do not exist everywhere, especially in eco-sensitive regions like the Himalayas where it is challenging to construct large facilities for irrigation and farming for modern agriculture. To achieve food security, traditional agriculture systems need to be promoted with modern inputs to increase crop production and decrease the ill effects of chemical fertilizers used in modern farming for the holistic development of the agriculture system especially in the Himalayan Region.



Fig.1. Traditional harvesting, sun drying and storing methods of Maize crop

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Traditional Costumes of Sikkim



Traditional Costumes of Darjeeling (West Bengal)



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Traditional Costumes of Nagaland



Traditional Costumes of Mizoram



Traditional Costumes of Tripura



Traditional Costumes of Meghalaya



Traditional Costumes of Assam

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