



HimKatha

Celebrating human-nature relationships

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Nawang Tenzin
21

Editorial

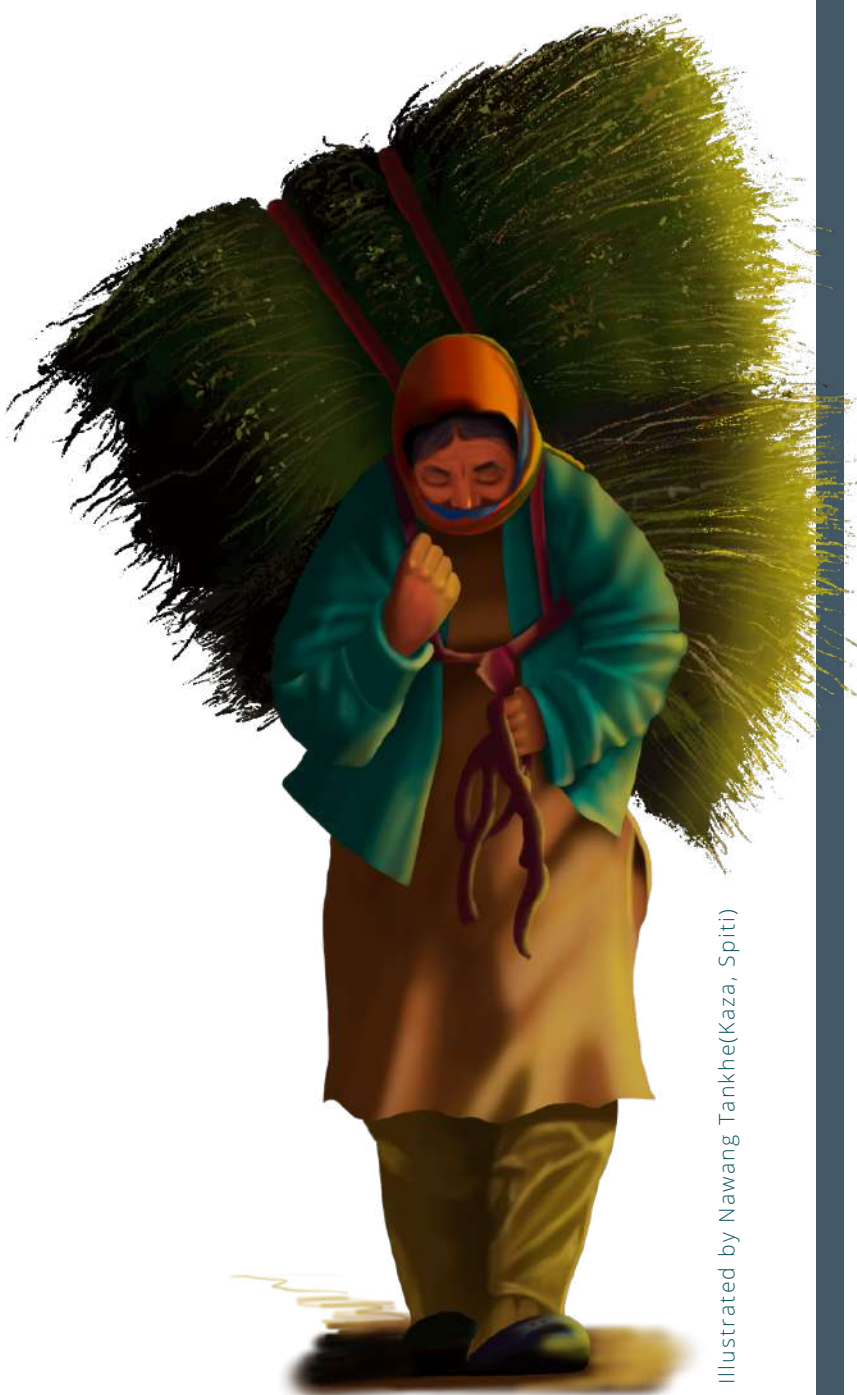
Change is the only constant. Fast or slow, over our lifetime we are witnessing change in and around us. Here in the remote himalayan valleys, where life was human-paced until a few decades back, access to technology, information and increased connectivity is changing the way of life. One key aspect of mountain life which is greatly impacted is agriculture which is the theme for this issue of Himkatha.

Agriculture, the primary source of income for many communities in the trans himalayan landscape, has considerably evolved over the last 2-3 decades. Traditional practises, heirloom crops, knowledge, tools have slowly been replaced by modern techniques, cash crops, latest information and power tools. Livestock which provided labour and manure, is also being replaced by machines and

fertiliser. Due to declining livestock and need for fodder, the dependence on pastures is also seeing a shift. Farmers are now able to grow mushrooms in a cold desert at 4200 metres, be updated with the latest weather and government schemes, sell their products on online platforms, adopt sustainable methods of cultivation and more. Through this issue, we have tried to uncover these changing relationships between humans and agriculture and what it means for a young farmer versus a farmer who has spent their entire life in the fields.

Hope you enjoy reading these wonderful stories from Lahaul - Spiti & Kinnaur.

Deepshikha Sharma
Nature Conservation Foundation



Illustrated by Nawang Tankhe (Kaza, Spiti)

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Changes in Agriculture: A story from Himachal's Lahaul Valley

By Chhering Gaaji

I hail from Gumrang - a small rugged village in Lahaul (Himachal Pradesh). There are about 22 households and we are majorly dependent on agriculture. Farming along with livestock husbandry and agro-pastoralism has been traditional livelihood for locals here but there has been significant changes in since last decade. I have been farming for over the last 17 years, I have seen how much has changed in the valley in terms of food sustenance, practices around agriculture and resource usage.

I remember, when I was young, we used Yak and bulls to plough our fields. Traditional methods of ploughing like this required at-least two men and yaks to complete the task but we have gradually shifted to machinery to get the work done single handedly. About 30-40 years ago, we would cultivate *Kaatu/Kathu* (buckwheat), *Jo* (barley), *Kala matar* (black peas) in Lahaul which is enough

for our sustenance. These traditional crops are full of nutrients and are suitable for people living in high altitude landscapes. In the current economy, even with introduced cash crops like green peas, potatoes and apples, it is sometimes hard to make ends meet. One cannot fully rely on cultivation anymore, we are less resilient towards changes in weather, and crop disease.

Many villages in Lahaul are dependent on snow fed glaciers and springs for water resources. People wait for glaciers to melt and collect in water reservoirs before it is channelled for various purposes. In older days when the water was abundant, we could make water channels by our hands and get the water to the fields. Irrigation was done through hand-made *Kuls* (canals) and the water was distributed among different households on a rotational basis. However, due to change in weather patterns and



Photo Courtesy: Chhering Gaaji



Photo Courtesy: Chhering Gaaji

growing need, the glacial water melt is a scarce resource and sometimes there is also a need to pump it up from the river. The general access for water and irrigation has become more convenient with the use of drip and sprinklers in the fields but at the same time, many of the natural water sources like springs are drying up and there's less water in our *Kuls* now. Sprinklers and drip irrigation seem to consume less water but I realized our crops require frequent watering (2-3 times a week) as the water is not able to penetrate deeply in soil.

Years ago, each household had 40-60 livestock which was a good source of manure to the fields. Many families now have sold their livestock and now it's hard to find any cattle in the villages. Due to this, the access to manure also reduced and the fields produced less. Cash crops like green peas, cabbages and the cultivation of exotic vegetables like broccoli which is increasingly becoming more dominant in the valley require more tending. The families then opted to supplement their field with urea fertiliser which caused damage. Excessive usage can deteriorate the soil quality and can lead to more pest attacks. In many cases, it also impacts the field of neighboring families who might be using organic fertilizers for the crops. I hope we, as a community, become more sensitive to these changes and be mindful of long term sustainability of our land and resources.



Chhering Gaaji

Chhering Gaaji is from Gumrang village in Lahaul and has been farming for over 17 years. He grows green peas, potatoes and barley in his field. He is very passionate about traditional farming systems and continue to practice them on this fields.



Agricultural Practices in Spiti Valley

By Lobzang Tandup

"Ney yotna chukpo sam, nor yotna mak"

"Those who have barley are rich, not the ones with money"

- Spitian Proverb, Anonymous

Ever since my childhood days, I was very curious to know about the agricultural practices of Spiti valley - traditional crops we grow and how farming happens in a cold Himalayan desert. Like any Spitian youngster growing up I used to help my family with agricultural works whenever I am at home for holidays or during the peak harvesting season but I never got the opportunity to help them for the whole season. But last year, due to an ongoing pandemic, when I came home, I realized it was a good opportunity for me to understand agricultural practices first hand. I helped my family through whole process right from scattering ashes in the snow covered fields to prepare the field for ploughing to cleaning dried-up

water canals before harvest season to helping during peak season of ploughing, hand-picking green peas to preparing the gunny bags for sale and other remaining tasks of cutting grasses and leveling the fields. I also wanted to learn about the history of agriculture in Spiti valley and the elders in my family shared some interesting insights with me.

Traditionally, the people living in this valley grew barley and black peas for sustenance. They used barley grains to make *Sampa* (flour) or *Arak* (traditional alcohol). They also used barley and black peas to barter it with traders from Changthang who in turn would give *Lena* (Pashmina) and *Khullu* (Yak wool) in

the 1960s however, things started to change in the valley. People started growing cash crops like green peas and potatoes as access to outside markets improved due to development of key roadways. Now, barley and black peas are grown only for self-consumption and are only a small share of the total agricultural production.

Agriculture in Spiti lasts only for six months. It's the most crucial time for all the farmers. Although the sowing season starts only in April, the preparations start months before. The seeds are either procured or developed and stored safely during the winters. When the snow first melts around mid-April, the farmers plough their fields with the best resource they have - *Yak* or a pair of *Dzo* and seeds are scattered by hand, but these days people use tractors, ploughing machines and even tillers are used. Ploughing the field is a two person job, but sometimes the whole

family can be seen in the fields helping out the parents. In Spiti, one's family, relatives and friends are one's greatest resources. Farming is very communal in nature. Everyone helps each other and sometimes even 3-4 families work collectively.

The system of communal farming helps ease the burden of marginal farmers who do not own *Yak* - they collaborate with *Khangchen* households (Zamindar family), borrow *Yak* for ploughing the field and in turn repay through their labour. *Yaks* are an effective but an expensive farming asset and not everyone can afford to buy and maintain them. The system works because it is based on a reciprocal relationship between *Khang-chen* (Big Zamindar) and *Khang-chung* (Small farmers) households and resource and labour are shared communally. Sometimes, the members of the *Khang-chen* household lend a piece of land for a few years to the



Photo Courtesy: Lobzang Tandup

Khang-chung household for farming. They do not have to necessarily repay through capital but the *Khang-chung* family can repay the benevolence through their labour works in the *Khang-chen* family - for instance, they can help the *Khang-chen* family during ploughing and harvesting season. This system is called “*Shey*” in Spitian.

The relationship between people, wildlife and nature go beyond utilitarian aspects. It is heavily influenced by cultural values and local practices around it. For instance, many Spitian households have unique names for their agricultural land which is a helpful marker of identification of one’s land and also carries meaningful ecological symbolism: “*Chup-ja*” (water-bird) is named for agricultural lands that resemble the shape of long-necked water cranes. “*Ti-rik*” is named for lands that resembles local barley-flour delicacy, “*Dorgya-ma*” is named for agricultural lands which is full of stones or pebbles owing to its hilly terrain, “*Yur-yok*” is referred to lands located beneath a water canal and “*Phe-kak*” (meaning half in Spitian) is often given to agricultural lands of “*Khang-chung*” families (small farmers) who gain their land after ancestral subdivision from *Khang-chen* family (big zamindari household).

There are a lot of farming songs and prayers that people hum while toiling in their fields. Farmers sing particular songs at every step. The songs have rich meanings related to farm works, weather conditions and comprises of odes and incantations towards local deities pleading for bountiful harvest. “Om Mani Padme Hung” - the holy Buddhist mantra is chanted while ploughing which symbolises farmer’s gratitude and compassion for Yaks and Dzogs who toil so hard in our fields. “*Laso-ho*” is chanted in merriment to ease the

stress and fatigue of animals when they plough in harsh weather.

As soon as the ploughing is done, the farmers wait for the first crop or sapling to grow a little before the cycle of irrigation begins (*Yurma*). This period is usually after 40 days from the day of sowing. Water is a scarce resource and there are local systems of water distribution and management called “*Chu-rey*” (water turns) entirely handled by women of the village. A group of women is appointed to take charge for the season to ensure timely, equitable distribution of water to each household. The *Khang-chen* (big zamindar)



Photo Courtesy: Lobzang Tandup

households have more access to water resources - they have frequent water-turns (*chu-rey*) and more water is allotted in their canals for irrigation. They also have more authority in decision-making as they are the original tax-payers of the land and have earned that right historically. Owing to scanty precipitation, irrigation becomes a daunting task - women get busy with watering works (*Yurma*) for over 2 months till the crops are fully ripe.



The green pea crop gets ready around June in low-lying villages (Kaza, Tabo, Rangrik, Pin) and August in villages in elevated regions (Demul, Komic, Langza, Hikkim, Kibber and Chicham). These crops are then transported and sold in Delhi and other nearby states. The produce from Spiti is considered of highest quality as the farmers do not use any insecticide, pesticide or weedicide in their fields. Instead they only rely on animal and human waste as manure. The sweet taste of green peas from Spiti valley is the result of unique farming techniques and hard-work of the people who do not give up despite harsh conditions and scarce resources.

The cropping patterns of green peas and barley are different. Green pea, although is the primary source of livelihood for the farmers, requires much more work and tends to consume more water. Barley is a traditional crop of Spiti that is favoured more by farmers due to its low input requirements, better adaptability to harsh conditions and is considered drought/disease resilient. Barley crops and black peas (kala matar) can be harvested later around August-September

when the work around green-peas is done. The remaining grass residues are collected to use for fodder or as a livestock feed for animals during winter.

Most Spitian households own a flat ground near their agricultural field called "*Ul-tak*" where separation of straw and barley (*Khu-yuk*) are done, cut grasses are brought and flours are grinded. The grains are finally stored in village. A group of women is appointed to take charge for the season to ensure timely, equitable distribution of water to each household. The *Khang-chen* households have more access to water resources - they have frequent water-turns (*chu-rey*) and more water is allotted in their canals for irrigation. They also have more authority in decision-making as they are the original tax-payers of the land and have traditional go-downs/storage called "*Bhang*" for better preservation.

Agriculture is the lifeline of Spitians and it is not just a livelihood means for us, but a way of life. Our tradition, cultural values and regional ethos revolve around agrarian

practices. Many local Spitian proverbs (*pera*) are reflective of that knowledge. I am sharing few as recounted by elders:

Nyima dot la mata, Dotpa chung la mata

Do not rely on the sun's warmth nor your appetite. This proverb talks about the importance of being alert, active and prepared when one is undertaking any agricultural work. When one leaves home in the morning for the field, a farmer has to be ready for any unpredictability - nor the pleasant heat of sun or one's appetite at that point can be relied on.

Ley betna, sey nyong

If you work hard, there will be a bountiful harvest.

Soye me phung, nyal phung

There will be agricultural loss not when you eat but when you sleep/laze around.

Ney yotna chukpo sam, nor yotna mak

Those who have barley are rich, not the ones with money.

Youngsters should realize that although modern farming and technology are easier and more convenient, nothing beats natural farming technique and indigenous knowledge of the people.

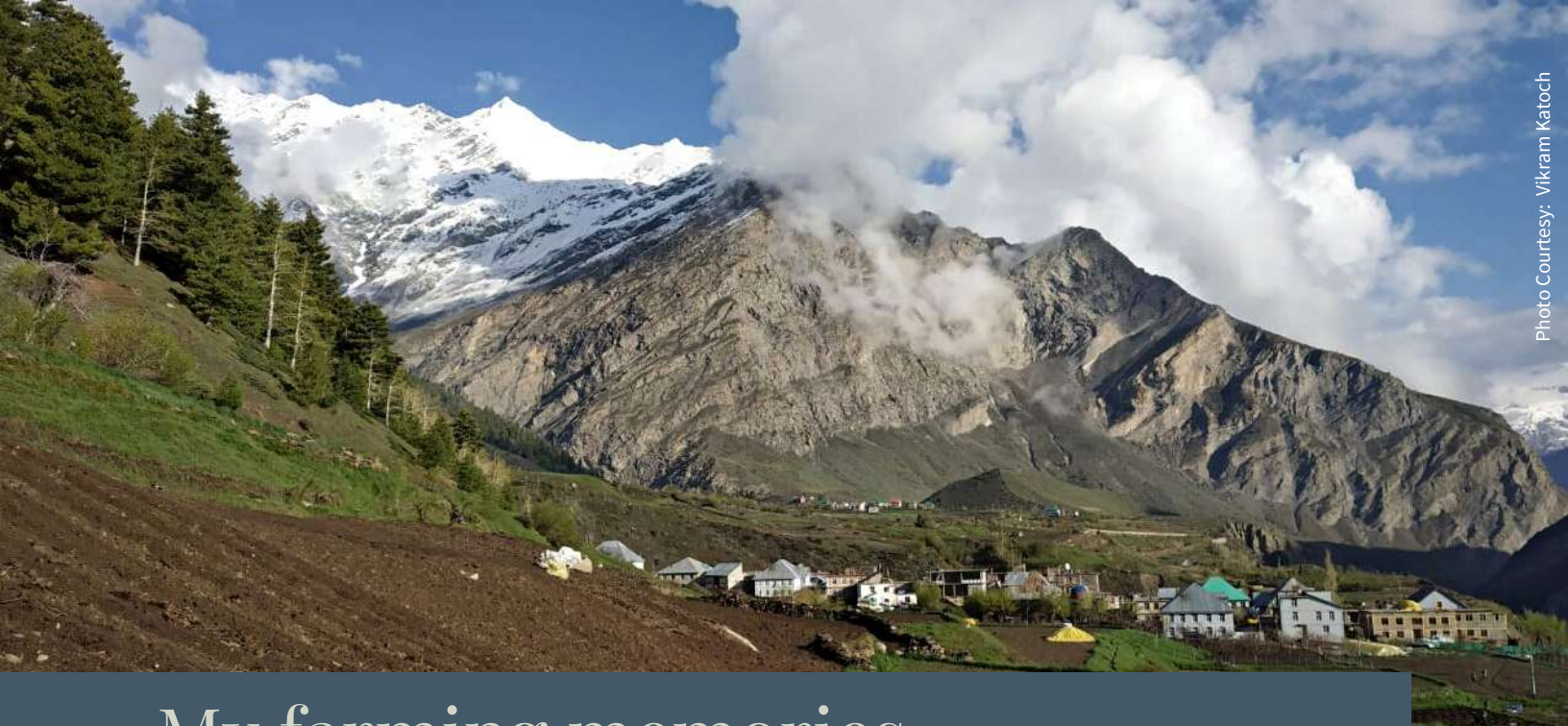
I am not an expert in farming or possess rich knowledge but I would like to share some suggestions, the ecosystem in the trans-Himalayan region is very fragile. Excessive focus on cash crops like green peas won't be sustainable for the long run. We need to incorporate traditional crops like barley as well as black peas which are more suitable to local conditions. We should think about long term ecological sustenance and food security for the entire community. Cooperative societies, local management should work in a collaborative manner to fetch fair prices to our farmers. Youngsters should realize that although modern farming and technology are easier and more convenient, nothing beats natural farming technique and indigenous knowledge of the people.



Lobzang Tandup

Lobzang Tandup is born and brought up in Spiti's Kibber village. He finished his graduate degree in Physics and Electronic studies from Punjab University, Chandigarh. He is currently self-studying for an entrance examination. He likes playing cricket, football and is gradually becoming more enchanted with trekking and snow skiing.

**Spitian Proverbs narrated by: Mr. Sonam Tanzin (Tanpa), Kowang, Spiti*



My farming memories

By Vikram Katoch

I spent my whole childhood in a small hamlet called Garang in Lahaul. In the summers my sister and I would help our grandmother with the household chores and in the fields. She would cultivate green peas, potatoes and wheat. In Lahaul, the sowing season starts from mid-March. Villagers would first clear the snow from the fields and then start sowing various seeds. Green peas and cauliflower seeds are sown first followed by potatoes. Farming is the sole livelihood of many villagers and before ploughing, people pray to their fields, the tools and the *baang* (oxen) in hope of a good harvest. After ploughing, the farmers use pickaxe to create small water channels in the fields. Our grandmother would let me and my sister do this task. She would instruct us on how to do this carefully and correctly. She would then add seeds of green peas after us. After covering the field with seeds, she would level it using long dry twigs.

We used to eagerly wait for the seedlings to grow. It would take around 30 to 45 days for

the first seedlings to emerge. This was the time when the weeds would be removed and the field would be watered through *Kuls*. Unlike traditional crops, most of the fields like green peas and cauliflower, require frequent watering - once in every 15-20 days. Around June flowers will start blooming in green peas fields and by August, the crops are ready. Harvesting season is the most important and everyone in the family will help collect the ripe peas. Since there is no farmers market/cooperative for peas in Lahaul, we are often forced to sell their produce to private dealers at meagre sum.

Similarly potatoes are also grown in our village. Each household prepares their own seed by keeping sacks of potatoes in a pit during the winters. When spring arrives, the seeds are unearthed and prepared. The beds laid for potatoes are deeper than that of green peas and are placed 5 to 6 inches apart from each other. The seeds are buried deep in the soil to ensure high and good production of potatoes. When the seedlings



Photo Courtesy: Vikram Katoch

Vikram Katoch

Vikram Singh Katoch is from Garang village in Lahaul. He is passionate about wildlife and likes exploring the beautiful landscape of his hometown. He has worked for 6 years in the maintenance department of Atal tunnel project in Rohtang -the longest highway tunnel in Leh-Manali road. He joined NCF's Himalayan Lab and assists the team in community survey and field interventions.



emerge, the fields are watered and by September the harvest is almost ready. The leaves from the plant are removed a few days before uprooting the plants. This helps to thicken the potato skin, thus making them more long-lasting. The potato harvest is ready by early October and the whole valley is suddenly humming with trucks collecting produce and taking it to the market. There are times when it's even difficult to find trucks in Lahaul and the farmers have to arrange trucks from the nearest town. Farming has changed a lot since my grandmother's days - increasing mechanization has certainly filled the gap of labour shortage but many households still struggle to find good market exposure.



Photo Courtesy: Vikram Katoch



A day in the life of a young farmer

By Vicky

There's an air of celebration when the agricultural season begins in my village. It is time to end the dormancy of long winter days and come out and start preparing the fields. I remember enjoying working in the fields and on the days when the fields had to be ploughed, I used to try to take leave from school on the pretext of doing some necessary work. We used to take out all the farming tools, clean it and check for any repairs. A day earlier, our bulls were also brought from another village and were prepared for ploughing. The excitement would not let me sleep and I would think of all possible excuses to take leave from school so I could help my family in the field.

The next day, my grandfather would make a barley offering to the local deity *Jogani*. After

the prayers everyone would take the offerings as blessings and proceed to prepare for the day. Before going to the fields, we would place flowers in the horns of the bulls. All the equipment and the bulls were then taken to the agriculture fields. I would also help out in guiding the bulls to the field which would give me immense pleasure. For traditional rituals, my mother would bring roasted barley (*kha*) & local alcohol (*chhang*) to the fields. We would then gather the bulls in teams of 2 and attach the plougher to them. After that we would offer chaang, kha and our prayers to our fields facing east (to garner the sun's positive energy into our lives).

My family would then begin the hardwork of ploughing the fields which would last a few days. The fields which were harder to plough,

were then ploughed with the help of *Shaalu* - my favourite mare. Unfortunately, I would never get permission from school to take off for a full day, so after the rituals, I had to rush to the school! Lunch for the farmers was prepared in the community hall and was served every day at 12:30 pm. For the bulls, the farmer would prepare *Pinniyan* balls of barley dough *Sattu* kneaded with local alcohol *Chaang*. This would give them strength for the remaining day's work. After resting for an hour after lunch the farmers would get back to work. In the evening, the farmers would have tea and local bread *puri* at 6, around the same time we would return from school. We would help out our parents till the sunset and then head back home. If there was any time left before it got dark, we would level out the uneven fields. The blades of the plough would be replaced by a plank of wood and the bulls would then walk the fields levelling it. To add extra weight, my sibling and I would fight to climb onto the

plank. By the end we would be covered in mud. We had an amazing childhood.

*We were blessed that we could work on our lands.
Now, all the time spent is on mobile phones in our hands.*

Farming life has changed drastically. The new age equipment gets the job done quickly but it's not a celebration like the old times. Earlier whole family would partake in the ploughing, sowing and harvest process, now it's a one person job. These equipment have in some way facilitated migration as now women single-handedly manage the fields. Bulls are replaced by power tillers and are rarely seen in any village. Agriculture was not just about growing produce for sustenance, but it was a way to form connections with our land, our animals and nature. And now, I see those connections fade.



Photo Courtesy: Vicky



Photo Courtesy: Vicky



Vicky

Vicky is from Mooling village in Lahaul. He studied geography from Govt. college Sanjauli (Shimla, HP). He likes exploring mountainous valleys and trekking. He believes every mountain is unique and has its own stories.



Photo courtesy: Kalzang Ladey



Photo from online sources



Photo from online sources

Mushroom Cultivation in Spiti

By Kalzang Ladey

Majority of Indians stay in rural areas with agriculture as their primary source of livelihood making India, largely, an agricultural country. Farming varies greatly across different regions given its geographical conditions and access to resources. It is increasingly becoming difficult due to growing effects of climate change across the country. Melting of glaciers, extreme weather patterns and excessive drought and rain have further increased our vulnerability. Farmers who are completely dependent on agriculture for their livelihood will face the brunt of changing phenomena and it is important to diversify our cultivation patterns. To aptly complement existing agricultural patterns, these alternatives need to be time-saving, less laborious and should also offer decent economic returns for the cultivator.

Given Spiti's mono cultural practises, I realised that mushroom cultivation in Spiti will provide a viable option for the locals. Growing mushrooms is fairly easy and

anyone can replicate the process once they are a bit familiar with it. One can easily cultivate mushrooms 2-3 times a year without any mechanical equipment. Moreover, there are no constraints on the scale of cultivation. It can be considered as a viable option by both small and big farmers alike. All they need is a small space in their houses. It roughly takes one month to cultivate mushrooms from scratch. In addition to usual agricultural crops, mushrooms can be added delicacy to your meals. Mushrooms are one the cheapest crops to cultivate if done with proper care - thus, with limited space and time, one can obtain a good yield. Mushrooms are extremely delicious and nutritious. It is a great way to build a diet full of protein, fibre and minerals. It contains a lot of vitamins, especially vitamin D. The nutrients available in mushrooms are helpful for people suffering from diabetes and other ailments. It is not surprising, then, that its presence in global as well as Indian diets is increasing. This is all the more reason for farmers to

take up mushroom cultivation.

Many types of mushrooms are in demand, but specifically in Spiti, we cultivate oyster mushrooms. Both fresh and dry varieties of these mushrooms are sold in the market. The mushroom soup you get is made from these oyster mushrooms. We have experimented with the cultivation of White oyster mushrooms (*Pleurotus florida*), Pink Oyster mushroom (*Pleurotus Djamor*), King Oyster mushroom (*Pleurotus Eryngii*/Kabuli Dhingri), Gray oyster mushroom (*Pleurotus Sajor Caju*) and Tree Oyster mushroom (*Pleurotus Ostreatus*). Oyster mushrooms are the best varieties to cultivate if you are trying it for the first time. These are very nutritious and require much less space and environmental conditions for a beginner. Mushrooms can be grown either through spawns or substrate. Spawns are referred to any carrier material which has mycelial growth to propagate mushroom. It can be considered like a seed in mushroom farming and comes in various forms like sawdust spawn, grain spawn (most popular for home grown mushroom cultivation process),

woodchip spawn and straw spawn. Substrate is a soil-like material that provides mushrooms with the nutrients, moisture and energy. It is high in organic matter making it desirable for cultivation. Different species of mushroom have different preferences of substrate hence it is important to match those requirements. A good substrate is dense woody fibrous material full of carbon.

I will briefly explain the cultivation process for those who are interested. There are two methods of mushroom cultivation 1) Organic sterilisation method 2) Chemical sterilisation method but I will recommend people to follow the organic cultivation method. In the organic sterilisation method, fill a large sized utensil with $\frac{1}{3}$ of water and keep it to boil. When the water starts boiling, add straw which will play the role of substrate. In Spiti, we add dry grass chips called *Phungma*. Keep the mixture on boil for about 2 hours (depending upon the quantity). Drain the excess water, lay the straw on a clean mat to dry it (overnight). When it is completely dry, you will need strong poly bags (14X18 or 16X24 inches) to transfer the material. As for



spawning, for 80 Kgs of straw, we require 1 Kg of spawn (mushroom seeds). The spawn can be sprinkled on the straw and can be mixed. Then comes layering where first we put some spawn in the polybag, then apply the first layer (2 inch straw), followed by another layer of spawn and finally topping it with the final layer of straw till we fill the poly bags to the brim. When this is done, close the bags in a way that it's air-tight and there's no room for moisture to enter. Once the bag is closed, make around 10-15 holes in each bag. Place these bags in a dark empty room or closet at 25 degrees Celsius for 15-20 days until the entire bag turns white. If there is any other colour formation, you'll have to dispose of the bag and start over.

It is important to keep the bags in a clean room with good humidity. Keep checking the mushroom bags every other day and start sprinkling the floor with water to increase the humidity in the room. Once it starts sprouting, softly twist individual mushrooms and pluck them for consumption. For the chemical sterilisation process, add 125ml of formalin and 10 gm of bovesteen (fungicide) in 100 litres of water. Washed and damp straw is then soaked in this water for 12 hours. Following that, the excess water is drained and straw is dried out and then transferred to polybags. The polybags are then tightly closed with a string and left for cultivation. Once the bags start becoming white, you can make a few more holes in it. Roughly, at every 3 inches, there should be one hole in the bag. This will help you get a better yield. These holes should be made by only those cultivators who are unable to maintain 90% humidity in the room. If the room temperature is between 20-22 degree celsius, then it is considered to be the most ideal for incubation.

Once it sprouts, same bag of mushrooms should be harvested together otherwise, it would take longer to prepare for the second flash. Second flash can be carried out roughly 7-8 days after the previous harvest. In this way, each bag can take 3-4 flashes easily. After 3-4 flashes of harvesting, remove the poly bags and prepare for the second batch using different bags. If this is done with proper care, the mushrooms will be ready in 25-30 days. If you are planning to cultivate pink oysters (Pleurotus Djamor), then a slightly higher temperature is required in the room. Thus,



Photo courtesy: Kalzang Ladey





Kalzang Ladey

Kalzang Ladey is a mushroom cultivator from Spiti's Chicham village. He has gained Mushroom cultivation training from Nauni University (Solan) and Centre of Mushroom Research in Palampur. He has been actively cultivating mushrooms since 2015 and produces 300 bags of Mushrooms throughout the year supplying it to local homestays, households and hotels.

With the support of the Horticulture Department in Spiti, he is able to train other farmers and spread awareness about it in remote villages. Collectively they have trained around 500 people in Spiti for the same. He is willing to help anyone who is interested in mushroom cultivation. He is available on his calling/whatsapp number : 9459758656.

you can cultivate these mushrooms in the month of June or July in Spiti. Other mushrooms can be cultivated between the months of April to September.

The Department of Horticulture in Spiti and honourable Agricultural Minister Shri. Ramlal Markanda helped me immensely in my journey of cultivating mushrooms. They helped me procure seeds, gain training and greater awareness about mushroom cultivation and subsequently helped me popularise it among local farmers. Along with the Department of Horticulture in Spiti, I have visited multiple villages to spread awareness and conduct training about spawn. We visited Losar Panchayat, Pangmo, Kibber Panchayat, Pin Valley, Kewling, Langza, Komic and trained about 500 people on mushroom cultivation. Men, women, young and elders all showed great interest and several of them started cultivating at household level. Along with awareness, we would also distribute free Spawns to encourage them.

We have been cultivating Oyster mushrooms till now, we can certainly try button mushrooms if we get the seeds. Institutions like ICR-DMR (Directorate of Mushroom Research), Centre for Mushroom Research and Training in Palampur and Dr. Y. S. Parmar University of Horticulture and Forestry, in Nauni (Solan) has been carrying out extensive research and training for mushroom cultivation. We should gain firsthand insights and attend their workshop. Their hands-on training is extremely beneficial. I am very thankful to the department and its officials. I will continue to work for mushroom development in Spiti and I hope that we are able to bear the fruits of this venture in future. My request to all farmers is to adopt mushroom cultivation actively and in case of any hurdles, please do not hesitate to reach out to me for any queries.





Photo: Panma Gyatso

Reflections on farming life

Prithvi Singh in conversation with Panma Gyatso

I was born in Hango (11,500 ft) which is a remote village in the Hangrang valley of Kinnaur. I am 72 years old and have spent my life in this village as an agro-pastoral farmer. Agriculture is very important to us. When I look back, I now realise that some of my most treasured memories of my village are related to agriculture and food. One of my favourite and most vivid childhood memories is from the time chulli (apricot) season arrived. Our village did not have any chulli trees, so our elders would go to the nearby village of Leo and get chulli for us. When they arrived, all the children of the village would run to the common ground to grab as much as possible in our little hands. Women would also find time during the day to enjoy chulli with each other under the winter sun. Relishing chulli was a communal affair. The seeds were saved to make prized chulli oil (750 ml for INR 2000/ USD 27).

My other happiest memories are of the

festivities and celebrations we had after the harvest. Until a few years back, we had an isolated winter in Hango. So we had to work really hard during the summers to ensure we had enough grains to survive the harsh winters. After gruelling work in the short summer season, the celebrations were especially sweet. Our harvest back then was of barley, potatoes, black peas and cheena/chize (local name). Cheena & barley were used to make flour for thukpa (soups) and salma (local bread). During the festivities we would make various dishes like tolopa, chulipanting (sweet apricot). Communally preparing and eating added exponentially to the taste of these dishes.

Barley was and continues to be used for making local alcohol like chhang and arak. No one, now, grows cheena. The seeds are also very hard to come by. It has completely vanished. Black peas & barley cultivation has also reduced and mainly taken over by the

cash crops like green peas, apple, cauliflower etc. Due to increase in connectivity with the outside world, wheat and rice which were only heard of back in my days, have now become staple food. Salma, tolopa, chulipanting etc which were favorites of all age groups are now hardly prepared. With our generation most of the traditional dishes



Photo : Panma Gyatso

are also fading away. I am hoping that we can slowly shift back to our traditional crops, as they grow best in our landscape, with focus on apricots for better economic gains. This way we will be able to ensure sustainable growth from agriculture.



Photo : Panma Gyatso

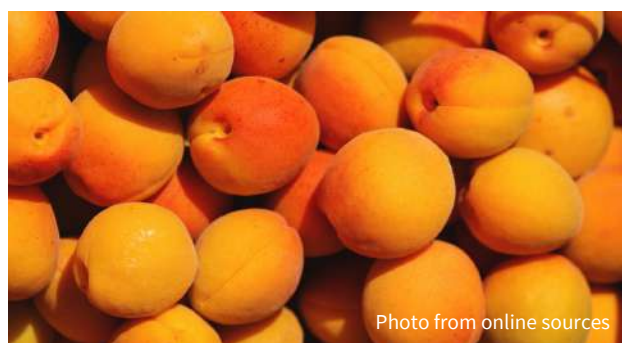


Photo from online sources



Prithvi
Singh

Prithvi Singh is a farmer from Hango village. He is currently the headman of the village (numberdar). He has shared information for this article with his grandson Panma via whatsapp voice notes.



Panma
Gyatso

Panma Gyatso is a farmer in Hango who wants to contribute to society. He also plays a very active role in wildlife conservation. At the time of conflict, he has helped many families claim forest department compensation.

Reviving Organic Apple cultivation in Shalkar (Kinnaur)

Story narrator by Karam Singh Negi, Chhering Lonbo, Tashi Dorjee and Inder Kumar Gyalpo to Chunnit Kesang. Curated by Chemi Lhamo.



Kinnaur valley in Himachal Pradesh is well known for their apple cultivation. These high hills provide ideal climatic conditions for apple crops with the requisite chilling season in the winter. An apple variety known as Malus Pumila is a widely grown cash crop in the entire Upper Kinnaur valley. Shalkar village in particular is known for growing organic apples that's much coveted for its sweetness and crunchiness. However, organic cultivation hasn't always been the default practice in the village. This change is inspired by one man's zeal and subsequent community resilience for better farming practises.

Perched at the altitude of 3200 metres, Shalkar is one of the last villages of Upper Kinnaur region before Spiti valley starts. There are over 110 households in the village - most of them dependent on apple cultivation for livelihood. While apples produced from other districts of Himachal ripen by July, the Kinnaur apples grown at a higher altitude start ripening around mid September or sometimes stretching till November hitting fruit markets across the country just before winter. The apples produced here are bulk transported to neighbouring metropolitan states where it is sold at a premium rate. Like many apple producing regions, the farmers here use chemical fertilisers and pesticides for bulk production. The usage became particularly more popular in recent years. In Kinnaur, It begins during the flowering season and continues till harvest. Use of chemical pesticides like Tefgor, Malathion, insecticide like Rogor, Durmet and a wide range of fungicides like Lethal, Kashstin, Majestic became quite handy for farmers seeking higher yield.

Earlier, many farmers do not use pesticides and fertilisers; most of them cannot even afford these but in recent years, the chemical spraying has increased from doing twice in a

year up to spraying seven times in a year. The rampant usage of pesticides deeply bothered Karam Sing Negi - a cultivator from Shalkar village. He became conscious of the long term health and environmental hazards of pesticides and was determined to find an alternative. He gradually minimised the use of harmful pesticides and other chemical fertilisers in his own orchard. For a farmer whose livelihood is entirely dependent on his orchard produce it was a risky move but for Karam Singh, there's no greater satisfaction than reviving natural ways of farming his ancestors practised for generations. Transitioning his orchard for organic farming wasn't easy - it needed a slow but consistent approach. He started minimising heavy chemical inputs and used only animal manure, human waste and other biodegradable waste suitable for it. For the initial few years, there was no prominent change and the yields were low. But he kept moving on with the same approach - his land needed to heal and the soil, the plants needed to reach its natural equilibrium.

Hearing his approach, His Holiness Lochen Tulku Rinpoche (Highly revered spiritual leader) advised everyone in the village to follow the same path. Rinpoche also shared Karam Singh's concerns regarding long term ecological damage. Adopting natural ways of farming will not only restore damaged

ecosystems but also will help avoid killing of small insects and microorganisms. Convincing everyone else in the village to avoid using pesticides and chemical fertilisers was challenging. Shalkar village comprised both big Zamindars as well as marginal farmers. The villagers had an internal community meeting regarding it and there were various opinions/reactions regarding it. Few agreed with the idea while others were concerned about low yield and low productivity which could eventually impact their own livelihood as apple orchards were subject to a lot of pests and diseases. After much discussion, everyone in the village unanimously agreed to avoid chemical fertilisers in their orchards. The villagers even hosted a religious ceremony seeking blessings from local deities for good harvest. Lochen Rinpoche inaugurated the "Jinshak" ceremony by scattering ash and manure in the apple orchards of Shalkar village and advising everyone to revive traditional farming practises. For the first 3-4 years, the apple yield from Shalkar village dropped drastically. With dwindling yields, there were many uncertainties - some farmers even struggled to pay school fees for their children. However, their resilience paid off when the apple orchards of Shalkar village slowly recovered and started bearing luscious apples again!

With passing years, the villagers experienced



improved yield from their orchard and noticed the apples from their village are different from neighbouring Kinnaur villages. Apples grown in organic farms in Shalkhar have a distinctive sweet, crunchy taste with a natural waxy exterior which even gained preference among bidders who are involved in large scale apple export business. The villagers are working towards organic certification which will help them gain due recognition in the market. This story of organic farming and community led change in a small himalayan village shows it is possible to grow pristine apples without harmful pesticides.



Storytellers

This story is collectively narrated by Karam Singh Negi, Chhering Lonbo, Tashi Dorjee and Inder Kumar Gyalpo to Kesang Chunnit. They are passionate cultivators from Shalkhar village in Kinnaur and grow organic apples in their orchard. They hope to inspire other apple growers in Kinnaur to adopt organic farming through their story.



Chunnit Kesang

Chunnit Kesang hails from Kibber village in Spiti and he currently works with NCF's High Altitude Program. He is passionate about wildlife and photography. He travels frequently within Lahaul, Spiti and Kinnaur areas to help build conservation champions and bring out stories from these remote villages.



Photo courtesy: Karam Singh Negi



Photo courtesy: Karam Singh Negi



Photo courtesy: Karam Singh Negi

Traditional Farming in Spiti – A Photo story

By Himanshu Khagta

After the snow melts on the high peaks around the villages of Spiti, the hard working people start their annual summer works - livestock are taken to the grasslands for grazing and people get busy preparing for agriculture season. Barley, potatoes and green peas are cultivated in the month of May and the crop is harvested at the end of August. It is then the valley gets a shade of green on its barren brown mountains.





Spiti receives very less average rainfall. The locals can not depend on rain for irrigation. The solution for this was found centuries ago and is still in practice.

The melted snow water from the glaciers flows down in the valley and is directed through *kulhs* (water channels) to the fields.

This process takes hours of hard work. The villagers, mostly women, start curing the fields in the month of June when the small stems of green pea plants can be seen in the fields.



In old days, people cultivated only barley and black peas for self- consumption, but around 1960s, the H.P govt. started promoting the cultivation of green peas, potatoes and other cash crops. In recent years, the region is gaining keen interest on cultivation of sea-buckthorn; the wonder berries rich in vitamin C.

The concept of organic farming, which has become well known in the last decade, is not new to Spiti. Crops like black pea and barley still remain free from any chemicals. So the next time you have *Sampa* (local Spitian barley flour), you can be certain of its purity!.



The green peas of Spiti are sold at a premium when they reach the market but people face the problem of connectivity. There is a major delay for the crop to reach the markets.



Despite many problems, the people of Spiti live with happiness and pride. They will be more than happy to have you as their guest. When my friend and I were trekking through distant villages, we tried to offer them money as a token of our gratitude for their amazing hospitality. No one accepted it and yet they asked us to come back again. We soon found a way to thank them. After saying bye to them, we would put the money in their pockets and run away!



Himanshu Khagta

Himanshu Khagta is an Indian photographer based in Shimla and he is known for documenting life in mountainous areas of Indian Himalayas. His work often revolves around the events and ordinary lives of the people that live in the region around his hometown.

His two long term projects, *Life in Spiti* and *Life in Shimla* chronicle his experiences living in the city of Shimla and the Spiti valley. His photographs have been featured in many publications including: The New York Times, The International Herald Tribune, BBC Travel, Conde Nast Traveller and Outlook traveller. Checkout his book *Life in Spiti* on Amazon: <https://amzn.to/3LiEjr0>

*Photo courtesy: Himanshu Khagta

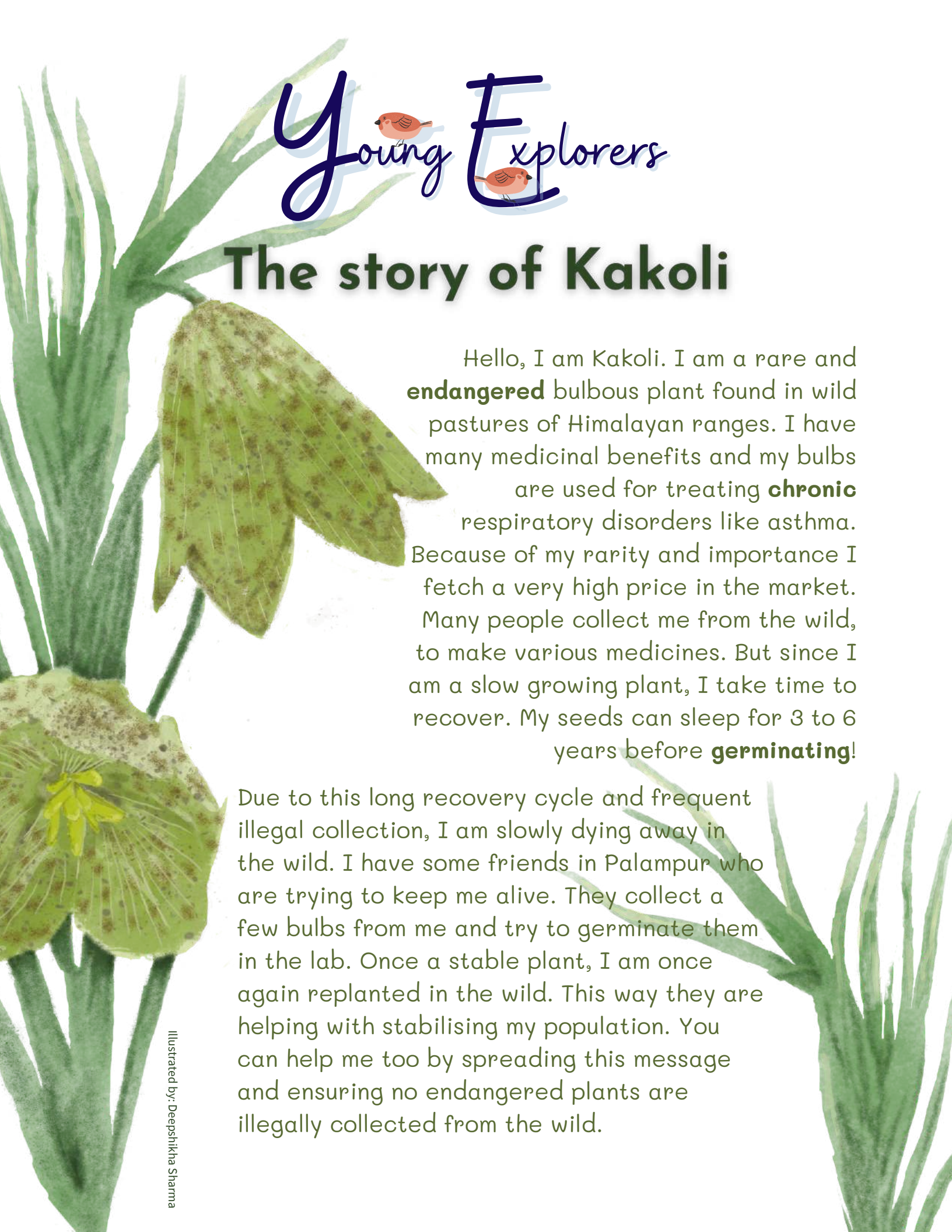
Prices of Grains & Vegetable in Lahaul-Spiti & Kinnaur 2021

Landscape	Village	Grains & Vegetables			
		Green Pea	Black Pea	Apple	Potato
Spiti	Kibber	Rs 69/kg	Rs 150/kg	Nil	Self Consumption
Spiti	Lossar	Rs 50/kg	Rs 200/kg	Nil	Self Consumption
Spiti	Tabo	Rs 55 - 65/kg	Nil	Rs 1,800 - 1,900/box	Nil
Spiti	Pinvalley	Rs 50 - 65/kg	Rs 200/kg	Nil	Self Consumption
Kinnaur	Nako	Rs 120 - 130/kg	Nil	Rs 1,800 - 2,000/box	Rs 1,500 - 2,000/box
Kinnaur	Leo	Rs 120 - 130/kg	Nil	Rs 1,800 - 2,000/box	Nil
Kinnaur	Shalkar	Rs 70/kg	Nil	Rs 1,900 - 2,100/box	Nil
Lahaul	Keylong	Rs 40-100/kg	Nil	Rs 1,000 - 1,500/box	Rs 900 - 1,000/box
Lahaul	Udaipur	Rs 40-50/kg	Nil	Rs 700 - 1,375/box	Rs 1,000/box

Landscape	Village	Grains & Vegetables			
		Barley	Broccoli	Cauliflower	Apricot
Spiti	Kibber	Rs 42/kg	Nil	Nil	Nil
Spiti	Lossar	Rs 50/kg	Nil	Nil	Nil
Spiti	Tabo	Nil	Nil	Nil	Rs 250 - 400/kg
Spiti	Pinvalley	Self Consumption	Nil	Nil	Nil
Kinnaur	Nako	Self Consumption	Nil	Nil	Rs 350 - 380/kg
Kinnaur	Leo	Nil	Nil	Nil	Rs 400/kg
Kinnaur	Shalkar	Nil	Nil	Nil	Rs 450/kg
Lahaul	Keylong	Nil	Rs 60-200/kg	Rs 15 - 40/kg	Nil
Lahaul	Udaipur	Self Consumption	Rs 70 - 80/kg	Rs 40 - 50/kg	Nil

*A box is approximately 25kg.

#The prices listed above are as quoted by the locals and does not reflect the official rates.

The background of the page features a watercolor illustration of the Kakoli plant. On the left, there are long, slender green leaves and two large, light green flowers with prominent brown spots. One flower is in full bloom, showing a yellow center. On the right, more green leaves are visible. The title 'Young Explorers' is written in a blue, cursive font at the top, with two small orange birds perched on the letters 'y' and 'E'.

Young Explorers

The story of Kakoli

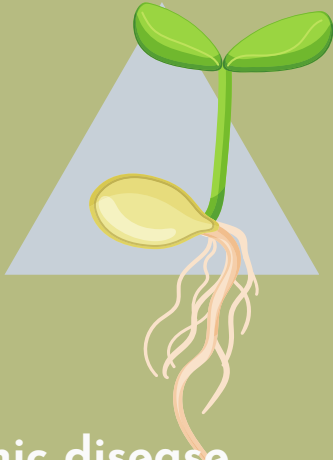
Hello, I am Kakoli. I am a rare and **endangered** bulbous plant found in wild pastures of Himalayan ranges. I have many medicinal benefits and my bulbs are used for treating **chronic** respiratory disorders like asthma. Because of my rarity and importance I fetch a very high price in the market. Many people collect me from the wild, to make various medicines. But since I am a slow growing plant, I take time to recover. My seeds can sleep for 3 to 6 years before **germinating**!

Due to this long recovery cycle and frequent illegal collection, I am slowly dying away in the wild. I have some friends in Palampur who are trying to keep me alive. They collect a few bulbs from me and try to germinate them in the lab. Once a stable plant, I am once again replanted in the wild. This way they are helping with stabilising my population. You can help me too by spreading this message and ensuring no endangered plants are illegally collected from the wild.

Key Words

Endangered species

An endangered species is a species that is very likely to die off in the near future



Germination

Germination is the process by which an organism grows from a seed or spore.

Chronic disease

Chronic disease is an illness which keeps coming back or is ongoing for a long time.



Information curated by Prof. Pankaj Kumar from Dr. Yashwant Singh Parmar University of Horticulture and Forestry, Nauni (Solan, Himachal Pradesh) for young readers in Himalayan villages. His research focuses on conservation of endangered Himalayan medicinal plants.



Activity

- Find out about local wild plants in your village.
- What are they used for and why are they important?
- Draw a picture of the plant and send it to us on our WhatsApp - 7650002777





Photo courtesy: Tashi Angroop

Beyond Agriculture– insights into farm based entrepreneurship in Lahaul (H.P)

Tashi Angroop in conversation with Chemi Lhamo

Agriculture has made considerable progress in Himalayan states. One of the major changes in the mountain farming system is from subsistence to commercial farming practice. There's a curious move towards high-value cash crops and diversification of cropping patterns. With connectivity and better exposure, farmers in these landscapes are increasingly becoming more innovative. Their approach in production, managing supply chains, and marketing are aimed at higher returns from farming. The New Age farmers from High Himalayan villages are more experimental and are more focused on searching for niches -apples, cash crops, fruits, exotic vegetables, flowers. Their engagement with farming goes beyond survival and sees it as an economically lucrative option for themselves and others associated in the value chain. Stories of such individuals dismiss stereotypical myths about farming and show how it can be adopted in changing times. Tashi Angroop from Tinno

village in Lahaul (H.P) dons more than one hat. He is a farmer, passionate entrepreneur, and agri-businessman who cultivates traditional grains, experimented and scaled up the cultivation of exotic vegetables in Todh valley, and is also initiating agro-tourism in his village. He started his journey in 2007 when he got an opportunity to work with World Bank's Project in Lahaul promoting Seabuckthorn nurseries. Further collaboration with the Department of Horticulture on Desert Development Program (DDP) deepened his experience of developing poplar tree nurseries and building seabuckthorn nurseries. With Jain Irrigation System, he extensively traveled in Himachal Pradesh covering 11 districts to understand diverse cultivation processes within the state and train locals in nursery building. He took a leap at his own venture in 2014 when he decided to take up farming as a full-time vocation. He took land on lease in his village to cultivate organic vegetables and

experiment with the cultivation of exotic vegetables which is a fairly new intervention in Lahaul back then. He began by procuring 1000 potato seeds (1000 Katta) and started growing them in his field. Initially, it was just potatoes, green peas, and cauliflower.

Over the years, Tashi gradually started diversifying and began cultivating more varieties of exotic vegetables and made efficient use of farming technologies and irrigation facilities. He now cultivates 19 varieties (mostly European exotic vegetables) vegetables in his field including broccoli, Iceberg lettuce, Red leaf, Yellow leaf lettuce, green leaf lettuce, Squash (Jugni), Yellow & green zucchini, celery, parsley, leek, snow peas, fennel, European carrots, red cabbages, other herbs, and exotic roots, etc. He introduced the same to many villages in Todh valley (Tinno, Gaimur, Jispa, Chika, and Sumdo) in Lahaul where farmers are now able to grow vegetables during off-seasons and sell them at a premium rate in metropolitan markets. Within his own community, he became the face of changing agricultural practices and popularized the phrase *"Tel bharo, Kheti Karo"* in Lahaul where he encouraged young farmers to adopt improved technologies like tillage machines and JCBs to do farming. In many instances, he even lent his own JCB and tiller machines to help people till rocky barren lands for farming.

The farming communities in Todh valley of Lahaul are now incorporating off-season vegetables along with traditional cereal crops. Different farming technologies like power tillers, tractor, power bidders, grass cutter, spray machine, sprinklers to improve the yield. Compared to Spiti the neighboring district, Lahaul receives more rain which is



Photo courtesy: Tashi Angroop



Photo courtesy: Tashi Angroop



Photo courtesy: Tashi Angroop

suitable for cultivation, potatoes, green peas, hops, cabbages, and other exotic vegetables and herbs. In fact, Lahauli potatoes are considered some of the best in the country and it is believed that these crops have brought prosperity to Lahaul.

Composting is an essential requirement to grow exotic vegetables and locals rely heavily on vermicomposting. Most Lahauli households have separate vermicompost structure at their home. Tashi himself annually prepares around 17 tonnes of compost to use it in his fields. He adds “We use jungle wastes like wild leaves, raw leaves, dry leaves, Juniper leaves, and other organic waste including manure, human waste, and Kenchua (organic manure)”. “Every household prepares compost 3-4 times in the unit and use it in their field to improve soil fertility”.

With time, locals were also able to enhance irrigation system and equip technologies which is more efficient and convenient. Earlier water resources are distributed among farming households on a rotational basis. There’s a watering turn for everyone and a farmer has to wait for about 6 days to

receive his share of water to irrigate the fields. With improved irrigation systems in most Lahauli villages, the watering turns have almost disappeared. Direct pipes were connected from glacial sources to Kuccha Kuls (field canals) and every household have direct access to it. Tashi enthusiastically adds “one can finish the irrigation within 3-4 hours now! Almost unthinkable in the past.” Almost 90 percent of Lahauli villages are relying on piped or drip irrigation systems. There’s an increased use of sprinklers and rain gun watering systems.

With improved road connectivity, better transportation system, and the availability of new crop inputs like hybrid seeds and organic fertilizers, the farmers in the hilly region of Lahaul are able to fetch gain higher yields and better prices. The returns from the sale of vegetables are five times higher than that of traditional crops. There’s a high demand for exotic vegetables in metropolitan cities and Lahauli cultivators are now able to sell their produce in Delhi, Chandigarh, Ahmedabad, Surat, etc. The farmers from Todh, Turat and Keylong have



Photo courtesy: Tashi Angroop



Photo courtesy: Tashi Angroop

collectivized and formed a union of 101 farming households to provide better market exposure and greater revenues for the local producers.

Some of the initiatives include farmers market, over-the-counter payment system for the farmers, and also experimenting with the concept of “one village, one crop” where each village will focus on producing a single crop unique to their area and giving better opportunities for farm entrepreneurs. The farmer’s union will be collaborating with big hotel chains like Taj to supply them year-round vegetables.

Opening up of Atal Tunnel has also huge impact on farming in Lahual. There’s surge in tourists flocking in the valley and farmers are keen on integrating agriculture and tourism. They have initiated farm-based enterprises like camps and homestays where tourists can take part in the sowing process, harvesting, procuring vegetables, and immerse themselves in rural agricultural life with locals during their stay. Tashi’s own farm camp in Tinno and Keylong attracts a lot of tourists. He shares that the motive is to give them first-hand experience of agriculture, self-cooking and be part of the collective experience of the landscape. Cultivators like Tashi show that there can be a more forward-looking approach for agriculture and it can harp beyond the traditional way of life. With greater solidarity, there’s positive hope for farming in high Himalayan landscapes to empower small farmers.



Tashi Angroop

Tashi Angroop is agri-entrepreneur from Tinno village in Lahual. He cultivates organic exotic vegetables in his farm and is interested in sharing his knowledge to youth in himalayan villages. His experience ranges from developing nurseries to cultivating wide varieties of vegetables to marketing it in big metropoitian cities.

Photo courtesy: Tashi Angroop



The Artists



Nawang Tankhe

Nawang Tankhe is a freelance artist based in Kaza (Spiti) and he has studied visual art from Himachal Pradesh University. He likes oil paintings and has participated in many art fairs and exhibitions to showcase his skills. He regularly contributes to Himkatha through his artwork.

✉ nawangtankhe@gmail.com

☎ +91 9459962433/ +91 8219150327

📘 @art in Spiti

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**Nature Conservation Foundation
1311 "Amritha", 12th A Main,
Vijayanagara, Mysore, 570017
Karnataka**

Team Credits:

Editors: Chemi Lhamo, Deepshikha Sharma,
Jenis Patel

Newsletter Design: Vindhya Jyoti

Newsletter Logo: Shrunga Srirama

Design Medium: Canva Pro