Chapter 36

Agrobiodiversity Values and Issues Related to the Domestication and Farming of *Kuth* (*Costus*) by Highland Farmers in Lahul Valley, Himachal Pradesh, Indian Himalayas

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Introduction

The cold and dry valley of Lahul in the high mountains of the Indian Himalayas is now known for its irrigated agriculture, in particular the cultivation of quality seed potatoes, hops, and now vegetables. Traditionally the highland farmers of Tibetan origin were subsistence farmers who cultivated crops such as naked barley, buckwheat, and rape seed, as well as keeping large numbers of livestock. The access to unique bioresources, such as medicinal herbs, was always used to generate cash income to meet the needs of the families. It was this indigenous knowledge of the value of local bioresources that led a few farmers in the area to take the bold initiative in the 1920s of domesticating a valuable wild plant, *Costus sp*, locally called *Kuth*. Natural occurrence of the species in this valley was rare, but the agroclimate for cultivation looked right. *Kuth* was the first ever cash crop domesticated and cultivated by the farmers in the dry temperate region of Lahul Valley, once a most marginalised, inaccessible, and isolated area. *Kuth* initiated the economic transformation of the area, and people in the area have an emotional attachment to it as well. *Kuth* has been used in ethnic-pharmaceutical practices to treat coughs, cholera, bronchitis, and skin allergies. The *Yamchi*(s) (local medical practitioners) use it for various medical therapies. It is also used for colds in animals. Kuth is one of the ingredients in the herbal mixture used in religious ceremonies. The emotional attachment to this crop helps to make it a suitable farm enterprise for the specific climatic/ecological niche in this region.

This paper describes the history of the cultivation process of this important cash crop for Lahul farmers, and the challenges of sustainability it has been facing.

The paper also highlights the fact that, although this folk innovation and practice is most desirable in terms of ecology and agrobiodiversity, marketing controls and overzealous implementation of the national conservation policy is threatening the sustainability of this farmer domesticated cash crop. The paper further highlights the failure to consider the mountain perspective, or take into account local agrobiodiversity when selecting and promoting appropriate niche-based crops for such fragile areas.

Box 36.1
Agroecology of Kuth Crop

Kuth (*Costus*) is a biannual crop. Farmers collect seeds after two years. The seeds are usually broadcast at the time of ploughing. *Kuth* is sown alongside buckwheat soon after harvesting barley in July/August. In addition to organic manuring through inputs of night soil, some inorganic fertilizers are also applied now, for example superphosphate, calcium ammonium nitrate (CAN), and NPK mixture. Irrigation is applied regularly. Sometimes a companion crop of peas is also grown during the first year after sowing *kuth*. Seeds are harvested in the second year, but the roots are collected during the second or third year depending upon the area and crop growth. The fresh roots are cut into pieces, dried, and packed in gunny bags for marketing

Approximately 2-3 kg of *kuth* seed is required to sow a *bigha* (800 sq.m.) of land. This will produce about 8-9 maund (40 kg in a maund) of roots and a further 10-12 kg of seeds.

Ecological Compatibility

Kuth roots are harvested 2-3 years after sowing in the field. Unlike annual crops, *kuth* requires few agronomic operations during its 2-3 year stay in the field. The fertile topsoil experiences minimum disturbance and loss through wind erosion. This minimal soil loss during the growth period of the crop is further indication of the harmony of *kuth* cultivation with the ecological setting of the area. The fields are watered immediately after the roots are dug up to prevent soil loss through wind erosion. *Kuth* cultivation is generally done on flat land in the valley and less on slopes. This results in better root formation and again minimises soil erosion by wind. The cultivation pattern indicates farmers' awareness of environmental conservation. *Kuth* cultivation poses no threat to the environment, rather it helps prevent environmental degradation.

The Domestication of *Kuth*

Folklore says that up to the beginning of the 20th century, *kuth* (*Costus*) was collected from a few locations in the forests of the northwestern Indian Himalayas and it was becoming rare. Around that time, two innovative farmers - Jamga Phunchog of Tholang village and Maya Das Dhoko of Kirting village - took *Kuth* seeds from a folk medicine doctor or *Vaid* in order to try to cultivate it. The idea was to meet the increasing demand of markets outside the valley in the Indian plains. Mr. Jamga Phunchog had a large family of 15 children (out of 25 born)

and a wife to support . He first raised *kuth* seedlings and the crop on a small parcel of his family farmland. He was successful in husbanding the new crop and collected more seeds. Following this success he needed more farmland. To encourage him, the local padre of the Morabian Missionary gave him some farmland that the padre had purchased for vegetable farming. When Jamga raised *kuth* seedlings on a large scale in the nursery beds and transplanted these to his 0.25 hectares of new farmland, people laughed at his foolishness for using scarce irrigated farm land to grow a wild plant. Looking at the broad green leaves covering the field in the first year, people mockingly remarked that he was going to feed leaves to the 17 members of his family. Mr. Jamga just smiled. In the second year, tall plants with flowers covered the field like a jungle, but people smiled. In the third year he harvested the roots with his children. He was not really clear of the benefits he was going to earn from this *First Harvest of Kuth* and people were now curious to know what he would do with it. He collected the harvested roots, cut them into pieces, dried them, packed them in bags, and, with a caravan of horses carrying his produce, left for Manali, the nearest market town 100 km outside the valley across the Rorhtang Pass. When Jamga returned to his village, he had four mule loads of silver coins earned from the first harvest of *Kuth*.

The second farmer, Maya Das of Kirting village, had started *kuth* cultivation at the same time. But his idea of *kuth* cultivation was not accepted by most members of his joint family of 150, so he threatened to separate from the family to continue his *kuth* farming experiment. This worked and the family cooperated. Later folk songs were composed about the success of Maya Das in *kuth* cultivation and the economic gains he made. A line in local language says,"*Maya Das a doluru Kia Kia Kia*". It recognises Maya Das's ownership of this valuable crop (we could call it a kind of folk patent system). Both of these farmers perfected the agronomic practices needed to domesticate this plant which originated in the forest. No more laughter, and *kuth* farming took over the whole valley. In those days farmers bartered *kuth* seeds for an equivalent weight in silver coins, such was the high value of the crop. Between 1920 and 1960, *kuth* as a cash crop dominated the farming systems in the valley. The socioeconomic prosperity of the area was essentially a manifestation of *kuth* domestication and marketing as a cash crop. The acreage under *kuth* cultivation increased tremendously. The reasons for its increased cultivation were the increasing need of farming communities for money for education of their children and basic amenities, migration and settlement to the nearby areas of Kullu and Manali, and a greater demand for *kuth* in the international market dominated by the demand from China through Tibet. In addition to China, *kuth* was exported to Taiwan and some western countries, notably France and Germany.

In their first attempt to manage marketing collectively, farmers registered a company. This failed because of the tactics of outside *kuth* traders They then

attempted to organize themselves into the *"Lahul Kuth Growers Cooperative Society"* in 1959. This society worked very well until 1962.

Blocked Market as First Challenge

The first blow to *kuth* farming came in 1962 when access to the main *kuth* market in China through Tibet was blocked because China and India were at war. This shook the whole trade and the flourishing farms in Lahul. It was a sudden unforeseen external challenge to the sustainability of farmer-innovated *kuth* farming and to the wild genetic resource that was being conserved through agriculture. Without the support of national institutions in exploring new markets, it was not possible to undo the damage.

Alternative Crop Promotion as the Second Challenge

Although some farmers maintained *kuth* farming even after 1962 hoping that marketing avenues would improve, around 1966 there was a further challenge to *kuth* farming from commercially important potato varieties. National institutions in India faced a serious scarcity of quality seed potatoes, and Lahul was selected as the most promising area for producing disease-free crops. Being free of monsoon, epidemic late blight had no effect in this region. Thus the government made an all out effort to promote potatoes farming in this area as an alternative cash crop. Thus the combined impact of marketing difficulties for *kuth* and the new crop option of potatoes resulted in the near elimination of *kuth* farming from the Lahul Valley. By the late seventies only a few farmers, mostly in remote areas, were cultivating *kuth* hoping for the return of better days. These farmers could not adopt potato farming and crop cultivation because of access problems. They were either storing *kuth* produce or selling in local markets for local use only with less returns.

Export Policy on Endangered Species as the Third Challenge

Kuth cultivation, a farmers initiative, received a further serious setback during 1985-88, from the policy on trade in endangered species. The pro-biodiversity conservation policy announced by the Government of India banned the export of endangered plant species.

In itself the policy was fine, but the improper implementation of the regulations, with respect to the ban on export of *Costus* species, highlighted bureaucratic ignorance reflected in arrogance.

Further, the Botanical Survey of India listed it as an endangered species of wild plant in the Indian Himalayas.

Farmers then petitioned the Government of India, the Botanical Survey of India (BSI), and planning and other government departments to negotiate that *kuth* was cultivated as a crop in their fields, and that they were thus helping its *in situ* conservation. In 1988, after physical verification by the officials from the above departments, the farmers of the valley got permission for its export on the condition that they showed a certificate from the local divisional forest officer (DFO) or the Lahul Potato Growers' Cooperative Society saying it was 'cultivated *kuth*'.

Farmers' efforts indicate their continued interest in conservation of this genetic material.

Conservation of Traditional *Kuth*

The Lahul farmers are protecting through cultivation the same genetic resource that is now endangered in the forests elsewhere in the Western Himalayas. The farmers are maintaining the genetic purity of the species by collecting the seeds every year from the same root stock, or using the root stock to propagate the crop vegetatively. Cultivation of *kuth* is thus ensuring conservation of this endangered medicinal plant.

Abandoning *kuth* cultivation by Lahul farmers would have a direct implication for the genetic erosion of this plant as its populations in the forests of Garhwal hillls in Uttar Pradesh, the forests of Chamba in Himachal Pradesh, and the forest of Srinagar and Jammu and Kashmir have reached near extinction levels.

Economic and Ecological Potentials of *Kuth*

Kuth has played a significant role in the development of sustainable farming systems in the valley through such things as its promise of cash-inflow, ethno-pharmaceutical properties, isolation/confinement to the area, prompt adoption, proven record of economic transformation, place in marginal farming areas, ecological compatibility in terms of less soil disturbance, low labour requirement, low inputs, and negligible insecticide/pesticide use. In fertile and accessible areas, cultivation is supplemented by potatoes, peas, and hops. However, it has also quickly occupied marginal areas where new approaches and technological interventions have failed to show their worth. The advantage of storing or delayed harvesting is an added advantage that further justifies its cultivation in isolated inaccessible areas with marginal lands and scarce labour resources.

As a result of price fluctuations, lack of marketing avenues, lack of research and development initiatives, and lack of government patronage it is difficult to maintain the high value of the crop. There are vagaries in prices, for example it

Table 36.1: **Comparative Cost/Benefit Figures for Cash Crops Grown in Lahul Valley (values are in Indian rupees per Bigha: one Bigha = 800 sq.m., and 1US$ = 35 rupees in 1995)**

Cost per bigha	Costs/benefits per (ICRs bigha)			
Inputs (Labour & Materials)	*Kuth*	Potatoes	Peas	Hops
1. Seed	100	600	150	100
2. Ploughing field	200	200	200	200
3. Cow dung	375	375	125	375
4. Chemical fertilizers	550	500	250	280
5. Sowing/planting cuttings	100	300	100	50
6. Irrigation	300	400	200	250
7. Weeding/hoeing	50	50	50	50
8. Micronutrients	-	100	-	100
9. Fungicides	-	90	300	-
10. Harvesting	250	250	800	800
11. Post-harvest handling (cutting, drying, sieving, grading)	200	100	-	-
12. Packaging (labour & materials)	80	250	250	20
13. Road head carriage	40	250	70	50
14. Total cost of produce	2,245	3465	2495	2375
15. Income from companion crops	1,500	-	-	-
16. Total production in kg per bigha	320	2,000	960	300
17. **Gross income from sales**	11,100	7,500	7,200	9,000
18. Net Profit	**8,855**	**4,035**	**4,705**	**6,625**

Net Profit/income (Item 18) is calculated from Item 17 minus Item 14
Source : Compiled by authors (1995) from a survey of *kuth* growers of Lahul

was Rs 2,400 to 3,000 per 40 kg bag in 1995. Bhagwan Singh reported that *kuth* fetched better prices even in 1932-33. It was sold for Rs 20 per kg in Manali. Some farmers, especially those in marginal and inaccessible areas, grow the crop and store it till high prices are projected.

Number of Families Cultivating *Kuth* and Area Under Cultivation

During the 1960s, *kuth* cultivation extended over 400-500 hectares in Lahul. Following the introduction of new cash crops and the problem of marketing *kuth* farming is now restricted to about 80 ha maintained by about 350 farm families. The majority of these farmers belong to Miar Valley in Lahul.

Institutional Support Aspects

Farmers' Initiatives

The domestication and cultivation of *kuth* as a cash crop were achieved purely through farmers' initiatives. Farmers were involved in standardising cultivation

practices, post-harvest handling, or marketing of the produce. A *kuth* growers' association was formed during 1930-40. The *kuth* growers' society took some initiatives during 1983-85 to explore domestic markets for selling the produce in Delhi, Amritsar, Madras, Cochin, Bangalore, and Bombay.

Box 36.2
Letter of the Chief Minister of Himachal Pradesh State to the Central Government Agency for Removing Ban on Kuth Crop Produce Export

D. O. NO. TDHP/CM/85
17 April, 1985

Dear

I understand that the foreign export of kuth (Saussurea-Lappa) has been banned as per Import and Export Policy 1984 - 85, Schedule I, Commodities subject to Export Control, Part "A", Item 8 under XII (a) Plants and Derivatives head No. 25. This has caused a lot of hardship to the people of Lahul & Spiti, a border district of Himachal Pradesh. It may be recalled that while Lahul & Spiti was in Punjab, the Government of Punjab had declared kuth as "Agricultural Produce' vide Section 6 of the Punjab General Sales Tax Act, 1948, Item No. 39, Schedule 'B'. In 1982, Himachal Pradesh Government had withdrawn royalty on kuth and other impositions permissible under H. P. Forest Produce Transit Rules, 1978, keeping in view its position as agricultural produce, and it cannot be termed an "Endangered Species" of forest produce.

Kuth is a very remunerative crop and has a lot of demand in international markets. The economy of this border and tribal district of Himachal Pradesh will receive a boost if the restrictions mentioned above are removed. I shall, therefore, request you to consider this matter favourably in the interest of the economy of this tribal district of Himachal Pradesh.

With regards,

Yours sincerely,
(Virbhadra Singh)

[sic]

During the harsh days of the legal embargo on *kuth* export, farmers approached different ministries and politicians to get the ban revoked.

Conclusions

Farmers' initiatives to domesticate and cultivate *kuth* as a cash crop are praiseworthy. But the government's failure to provide support and patronage to

Box 36.3

To : The Additional Inspector General of Forest
Room No. 247-A, Krishi Bhawan
Dept. of Forestry, Government of India
New Delhi

Subject: Appeal to Lift the Ban Imposed on Export of '*Saussurea-lappa*' (costus root/*kuth*) in Schedule I: Commodities Subject to Export Control Part 'A' Items Export of Which is not Normally Allowed Item No:-8 (xii) - 25 - *saussurea-lappa*- (cb. *clastaraceae*)

Sir,

It is respectfully submitted as follows:

1. That ours is a Society working under the name and style of "The Lahul Kuth Growers Co-op; Society Ltd.," office at Manali, Dist. Kullu H. P., registered under the 'Punjab Co-op. Societies Act' and later 'The Himachal Pradesh Co-op. Societies Act, 1968, No.-3-1969. This society is constituted of 591 small and marginal kuth (Sassurea-Lappa) growing farmers of the Dist. Kangra then in Punjab and tribal Dist. Lahoul & Spitti., now in Himachal Pradesh, situated in a very far remote corner in the extreme north of H. P. near the Indo-China border, the area of which remains cut off from rest of world for nearly seven months a year, due to heavy snow fall in the region. These marginal farmers used to cultivate Kuth (Sassurea-Lappa) on their farms since 1920s and since then the produce used to be exported through private traders and later on through State Trading Corporation after the formation of this society in the year 1959. The plantation of the "Sassurea-Lappa' is done entirely on the farms only and under agricultural style. This plant does not exist in the jungles of Dist. Lahoul & Spitti. The yearly production figure varies from 300 mt to 800 mt. The production can further be enhanced in case there is liberal Export Policy to this item. It fetches good price at domestic market from Rs. 30/ - to Rs. 45/- per kg.

2. That the Chief Controller of Import & Export has imposed a ban on the export of this item Sassurea-lappa (Costus root/Kuth) in schedule - I commodities subject to Export Control Part 'A' items export of which is not normally allowed in item O. 8 (xn) 25. under Import & Export Policy April, 1985 to March, 1988 volume Ii Export Licensing Govt. of India Ministry of Commerce, due to the reasons that it comes under the endangered species.

3. That this imposition of ban on exports has not only affected the trade and cultivation of Saussurea-Lappa, but also has affected the economy of the poor growers who entirely depend upon this cash crop for their livelihood. A large quantity of this root is still lying unsold with the Co-operative Society and farmers and the fresh crop too is ready to harvest. The growers have borrowed loans and advances against stocks and are under debits.

4. That the poor kuth growers had discussed the matter with the Honourable Prime Minister Late Srimati Indira Gandhi during her last visit to the Dist. Lahoul & Spitti at Keylong in a meeting on 5th August 1984, where she clearly had assured to safeguard the interest of the poor growers.

5. That the Saussurea-Lappa as an agriculture item has clearly been justified vide Punjab Govt's Notification No. 4-KM/4288 MAII/RCS dated Jullundar, 24th November., 1961, that kuth (Saussurea-Lappa) is an agriculture produce according to section 6 of the Punjab General Sales Tax Act, 1948, item No. 39 (Schedule B) the sale of kuth is not liable for the payment. A copy of notification is attached in annexure No.-I.

   For its further justification the publication of the Council of Scientific & Industrial research, New Delhi in "THE WEALTH OF INDIA" RAW MATERIALS VOL. TX-RL-So page No.-240-241 clearly justifies the farming, production and status of this item in Lahoul & Spitti Dist. A Photo-stat copy of the same is attached in annexure No. 2.

6. That the costus root/Saussurea-Lappa is generally used for medicines and high perfumes in the foreign countries. There are also a few small oil extracting units of this material in India, whose capacities are very small against the production. M/s. A. T. Banon & Co., near Kullu also is among one of those. It has been reliably learnt that this Company has approached the Govt. of India to stop the export of the Saussurea-Lappa for its personal gains at the cost of the poor farmers who are still suffering with the unsold accumulated stocks of two years and one more harvesting season is ready in the near future. It is requested that while making any change in its export policy, the growers only Co-operative Society along with the local Forest Dept. and Himachal Govt. should also be consulted because any change in its policy directly effects the interest of the poor cultivators who do not have any say in the policy making.

Thus keeping in view, the above facts the worthy Additional Inspector General of Forests is requested to kindly recommend the case to the worthy Chief Controller of Import and Exports, Govt. of India to lift the ban imposed on the export of the 'Saussurea-Lappa' as soon as possible so that the poor tribal kuth growers be saved from its worst effect in time.

Thanking you,

Yours faithfully,
for the Lahoul Potato Growers Co-operative,
Marketing-cum-Processing Society Lahul

kuth cultivation has discouraged its further expansion. *Kuth* has been mistakenly listed as an endangered species by the Botanical Survey of India. An export ban was introduced because it was feared it would become extinct as a result of intense collection from the forests. But the farmers in the valley have been growing *kuth* since the 1920s, and are actually conserving this plant species *in situ* through cultivation in their fields.

Though *kuth* is a high-value cash crop, the prices received by farmers over the years have fluctuated greatly. This is frustrating for the growers. The quality of Indian *kuth* is considered best amongst that from other countries such as China. There may be greater marketing potential in terms of produce diversification in international markets such as those of Japan and Germany and other European countries. But, in the absence of proper marketing interventions, this potential remains untapped. There is ample scope even within the country to increase the value of the crop by promoting use by pharmaceutical and cosmetics' companies. Government intervention is needed to develop better marketing opportunities and promote cultivation as a cash crop by the farmers in the valley.

Despite the high potential for economic gain, the crop has not received any R&D support from the government. There have been only negligible attempts by the government to explore marketing avenues; or to invest in research to make the product more valuable. In place of *kuth*, the government has tried to promote other crops. Although these crops can provide quick monetary gains, they can never harness the niche occupied by *kuth*, since the valley offers the specific climatic conditions required for *kuth* cultivation. Cultivation of high quality *kuth* is only possible in mountain areas with arid and temperate conditions, and this valley has the most favourable conditions in the Himalayas.

Studies are needed on development, crop improvement, post-harvest handling, marketing, and related aspects. A rich export potential could be developed through value addition and development of by-products. This requires analysis of its chemical properties, which would lead to industrial research on its use. Product diversification should also be investigated, *kuth* might compete with Korean *Ginseng*. Research efforts are needed to help in the standardisation of cultivation practices to boost its productivity and reduce the crop period to one year from the present two to three years. Biotechnology (tissue culture techniques) could be used to shorten the vegetative growth period and enable setting in of early root formation.

Marketing is the major constraint to *kuth* cultivation and expansion as a low input/high economic return cash crop. Government interventions are needed to explore new marketing avenues. A research focus on value addition, coupled with the standardisation of cultivation technologies and the exploration of marketing opportunities, could benefit the economy not only of the Lahul Valley but also of all the dry temperate areas in the Hindu Kush-Himalayan region. Several areas in Himachal Pradesh are suitable for *kuth* cultivation, and they include the Spiti Valley, Kinnaur, and the higher reaches of Kullu, Mandi, Shimla, Pangi, Bharmaur, and Bara Bangal. Export rules need to be relaxed.

Kuth cultivation is definitely a sustainable cash farming enterprise in the Lahul Valley, unlike other cash crops such as potatoes. This is because the specific

agroclimatic conditions required for *kuth* are confined to this region only, whereas crops such as potatoes can be grown anywhere in the country. Crops such as potatoes offer immediate economic returns, but other areas might produce them more successfully, or cheaper, leading to a collapse in the market from this area. Good quality *kuth*, however, cannot be grown anywhere else. As long as there is a market, the region will be able to exploit *kuth* as cash crop.

Kuth harnesses the advantages of the specific agroclimatic niche in this valley better than other cash crops that can also be grown in other parts of the country. The crop represents a unique example of a farmers' initiative to domesticate and cultivate a wild crop for cash farming. Development of this crop is compatible with the perspective of mountain areas and with the sustainable development of traditional farming systems.