CHAPTER 12

DESIGNING FOR DEVELOPMENT

Principles and practices of a sustainable medicinal plant chain in North India

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Abstract. The Indian state of Uttaranchal, located in the Himalayan region, is richly endowed with a large variety of medicinal plant species, many of which have medicinal properties. Due to continued collection and increasing demand by Indian and global pharmaceutical industries, numerous medicinal plant species are threatened with extinction. Recent action research by KIT Royal Tropical Institute and the Centre for Sustainable Development shows that the cultivation of medicinal plants could provide an important source of income to the rural population in Uttaranchal, many of whom are small farmers. In spite of considerable government effort, no large-scale cultivation of medicinal plants has yet been undertaken in Uttaranchal. This paper draws lessons from a recently established public–private collaboration for production of a CITES-listed medicinal plant species for the international market. It draws initial lessons regarding the principles and practices that can lead to the formation of a sustainable medicinal plant chain. It focuses on the need for public-sector investment in pro-poor chain development, the role of service providers in chain innovation, and the role of civil-society organizations in public–private partnerships. It also examines the benefits that are likely to accrue to various actors in the chain through the collaboration, and the possible risks involved in excessive dependence on international markets.
Keywords: Kutki; chain development; poverty reduction; biodiversity conservation; Uttaranchal; cultivation

INTRODUCTION

The medicinal plant sector in Uttaranchal, a Himalayan state in northern India, can provide an important source of income to the rural population, especially as returns from traditional crops are declining (Alam 2003). Because of its diverse agro-climatic conditions and relative isolation, India's Himalayan region is richly endowed with a large variety of plant species, many of which have medicinal properties. The medicinal plants found in the Himalayan areas include species of

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particularly high medicinal value (Planning Commission 2000). People in India have long known of the benefits of medicinal and aromatic plants, which provide raw materials for both the pharmaceutical industry and traditional forms of medicine. Besides providing basic health care, the plants generate income and employment and also have implications for the preservation of biodiversity and of traditional knowledge.

In recent years the demand for medicinal and aromatic plants has grown rapidly because of accelerated local, national and international interest, the latter notably from the pharmaceutical industry in the West. Worldwide, the number of species used for medicinal purposes is estimated at more than 50,000, which is about 13% of all flowering plants (Schippman et al. 2002). In India, over 8,000 plant species are used in traditional and modern medicine (Planning Commission 2000).

Due to continued collection and increasing market demand, numerous medicinal plant species in Uttaranchal are threatened with extinction. This poses a serious threat to bio-resources and can have a particularly negative impact on the incomes of the poorest sections of rural societies. For rational and regulated collection, strong local communities and strict governmental control measures are necessary. The former are not in place in Uttaranchal, while collection control regulations tend to affect the poorest households hardest and push them into illegal, risky ventures. Based on recent action research, KIT Royal Tropical Institute and the Centre for Sustainable Development (CSD) concluded that the cultivation of medicinal plants could provide an important source of income to the rural population in Uttaranchal. However, in spite of considerable government effort, no large-scale cultivation of medicinal plants has yet been undertaken in Uttaranchal.

This paper describes an example of a public-private collaboration for the cultivation of Kutki (*Picrorhiza kurrooa)* by farmers in Uttaranchal for export to a European firm based in The Netherlands. This initiative is providing farmers with technical and marketing support and a guaranteed international market, so that the risk of cultivating medicinal plant species is reduced and farmers' income is increased.

EROSION OF THE TRADITIONAL MEDICINAL PLANT COLLECTION SYSTEM

Most of the medicinal plants from Uttaranchal are collected from forests and rangelands. The State Forest Department is responsible for regulating the collection of species from the wild that are not considered endangered. It determines the areas from which plants can be collected, fixes the volumes to be collected and monitors collection activities in order to prevent illegal and excessive collection. To promote the participation of local communities in conservation activities, the Government of Uttaranchal has set up a number of medicinal plant cooperatives (*Bhaishaj Sangh*). The State Forest Department issues permits to these cooperatives, which in turn employ contractors to organize collection. The contractors employ collectors, usually farmers with small land holdings and landless labourers. The contractors can sell the collected material either to the cooperatives or directly to independent

traders after paying royalties to the cooperative. The cooperatives sell to either the local agents of wholesalers, or traders in larger cities, or drug manufacturers. The traders supply the domestic and international markets, mainly in the United States and the European Union (Figure 1).

In the traditional collection system, the collectors and local contractors are in a very vulnerable position. As they cannot sell directly to large traders in big cities, the collectors depend on local traders for market information, credit and the actual marketing of the raw material. This puts them in a weak bargaining position and results in farmers receiving prices that are considerably lower than those prevailing in the wholesale markets. The illegality of the business also puts a downward pressure on prices at the lowest levels in the chain.

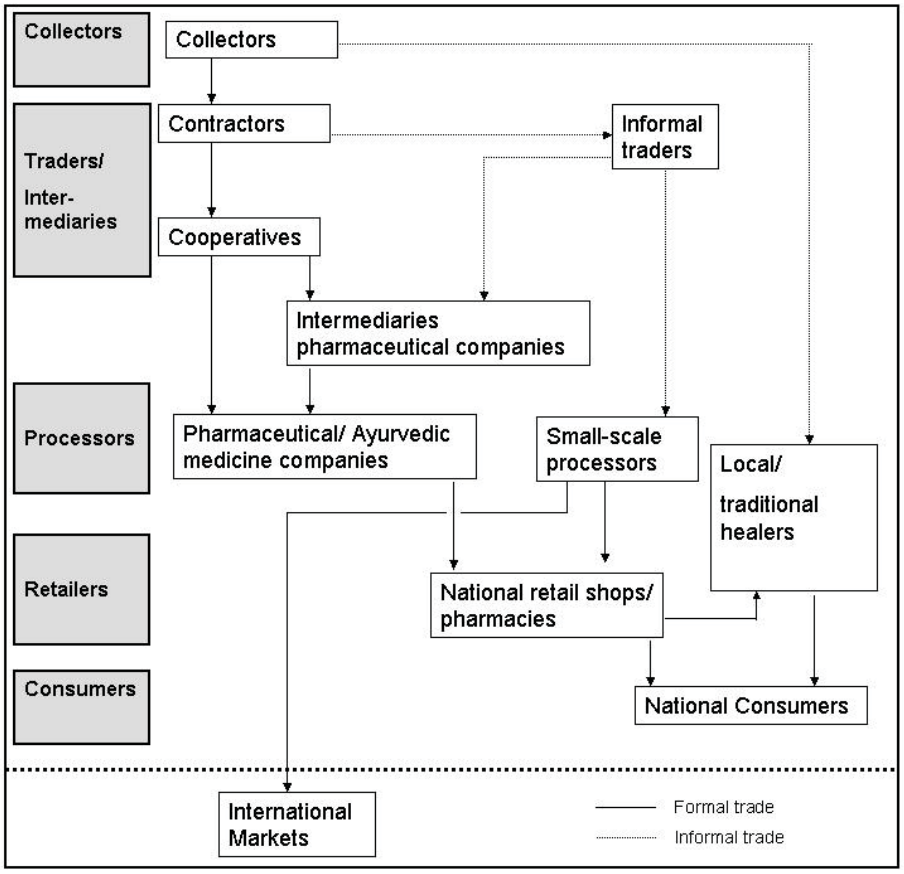

Figure 1. *The chain: from collection in the wild to consumption in India (Belt et al. 2003)*

The number of local traders, even in the large collection areas, is small. For example, in Munsiyari, a major centre for collection in Uttaranchal, five traders are reported to dominate the trade. Although the number of contractors in Munsiyari has increased to about 20, the trade continues to be dominated by a few traders (Virdi 2004). An important reason why contractors and traders exercise such strong control is that the collectors depend on them for loans. As many collectors are poor, they often need to borrow money, which is provided by the contractors and traders. This practice, which is widespread, keeps the collectors tied to local contractors. Also, as they have only small amounts to sell, they do not have the option of selling directly to wholesalers.

In spite of various policy measures, excessive and illegal collection of medicinal plants continues to take place on a large scale. This includes the collection of species considered endangered, whose collection is legally prohibited. The contractors who organize legal collection are often involved in illegal collection as well. As they have connections with both official agencies and large traders, it is easy for them to undertake illegal activities alongside legal trade.

Large-scale collection has led to the depletion of important species in the area. This is reflected in a significant decrease in the amount of material a person can collect in a day. For example, in Johar valley in the Pithoragarh district, collectors reported that, until five years ago, they were able to collect about 200 grams of dry Atish (*Aconitum heterophyllum)* in one day. Now they do not get more than 70 to 100 grams a day (Belt et al. 2003; Alam and Belt 2004).

There are a number of reasons for the excessive collection. Firstly, both collectors and contractors are primarily interested in higher incomes in the short run and have little concern for sustainability. As the contracts are given for only one year, the contractors are primarily interested in maximizing the volume of collection, irrespective of long-term effects. Similarly, the collectors are poor and need to maximize their income to pay back loans taken from contractors/traders. Secondly, the collectors are paid according to volume. Their main interest is to harvest as much as they can in the limited time available to them, irrespective of the consequences. Thirdly, many collectors do not have the traditional knowledge necessary for sustainable collection, and have no ownership over the resources they exploit. They use collection methods that are often detrimental to the long-term availability of resources (Belt et al. 2003; Alam and Belt 2004).

DEVELOPING A SUSTAINABLE MEDICINAL PLANT CHAIN: THE CASE OF KUTKI

Cultivation as a means to conserve biodiversity and diversify farmer's incomes

Motivated by the need to increase farmers' incomes through agricultural diversification while conserving biodiversity, the Government of Uttaranchal formulated a policy in 2002 to protect biodiversity through regulation of the collection of medicinal plants from the wild and through promotion of cultivation to

meet demand and provide new income opportunities to farmers (Government of Uttaranchal 2002). Recent action research by KIT and CSD concluded that the cultivation of medicinal plants could indeed provide an important source of income to the rural population in Uttaranchal (Belt et al. 2003; Alam and Belt 2004). However, despite considerable government effort, no large-scale cultivation of medicinal plants has yet been undertaken in Uttaranchal. The long gestation period of medicinal plants, combined with the high risk of initiating new business ventures, the lack of a secure market for cultivated medicinal plant material, poor institutional infrastructure to provide technical and marketing support, high transaction costs and insufficient social capital, has so far prevented farmers from carrying out large-scale cultivation (Van de Kop et al. 2004).

Recent initiatives in Uttaranchal show that public–private collaborations can play an important role in overcoming these constraints to the development of sustainable medicinal plant chains that are based on cultivated material. By offering farmers a secure market that can compete with their current potato crop and providing technical support, they are interested to explore this new way of income diversification. In this paper we describe a recently established public–private collaboration for the production of a CITES-listed species for the international market. The choice of a CITES-listed species has been made with the purpose of offering farmers a price premium for cultivated material. Currently there is no demand in India for cultivated medicinal plants in the domestic market, and price premiums for cultivation are not available. Although we recognize the difficulty of generalizing conclusions beyond the level of species and individual chains in the medicinal plant trade where each 'chain' is distinct, we will use this case to draw some initial lessons regarding the principles, practices and policies that can lead to the creation of sustainable medicinal plant chains in general.

Kutki demand, use and cultivation

Kutki (*Picrorhiza kurrooa)* is on Appendix II of the CITES list of endangered species, as well as on the red list of endangered species in India (no 28), which forbids the collection and trade in the species (CITES). European pharmaceutical companies have a large demand for Kutki since it has many uses. Although poor-quality substitutes are available from China, India is the main source of Kutki for the global market: it exports about 100 MT/ year. Since the trade of Kukti is banned, it can only be exported under different names. The Indian domestic Kutki consumption is estimated at 300 MT/ year. Of the total supply in India (400 MT/ year) 50% is estimated to be from the Central and Western Himalayas and 50% from the Eastern Himalayas and Nepal (Heemskerk and Belt 2003).

The roots of Kutki are used for the treatment of influenza and diarrhoea. Its active ingredients are also cited to protect the liver against jaundice and the negative effects of alcohol. The dried plant parts are used for the treatment of fevers and cholera. It is a laxative in small doses. It is also considered to be a valuable bitter tonic. Kutki can also be used for liquor production, since it contains many bitters. Both the Ayurvedic industry[1] and scientists consider Kutki to be among the top

twenty medicinal plants of India.

Kutki is a high-altitude perennial herb that grows between 2,500 and 4,600 metres. Its cultivation does not require good land, and it can be grown on poor-quality land on which other crops, such as vegetables, cannot be grown. The main limitations for farmers in the cultivation of Kutki are: the long gestation period, which means a lack of income for a number of years; the lack of a secure market and price premium for cultivated (as opposed to collected from the wild) Kutki; the lack of good quality planting material and the lack of technical and marketing support (Van de Kop et al. 2004). Overcoming these constraints requires collaboration between farmer associations, private industry, various public-sector institutions and NGOs.

Designing a cultivation-based Kutki chain

Our past research has shown that export markets can provide an important opportunity for farmers to receive higher prices for cultivated medicinal plants. In an effort to link farmer organizations from Uttaranchal to buyers in international markets, KIT approached importers of traditional medicines and aromatic plants in Europe to assess the potential for establishing international business linkages. This led to an interest from a Dutch company, IHC/VanderStelt (*Ayurveda Dr. J. VanderStelt. Homepage*). The company imports Ayurveda herbs from India and distributes them in The Netherlands and Germany as health products (capsules and tablets) to pharmacies, chemists, health shops and therapists. Currently, the total product range contains 55 products, all of them based on the Ayurveda principle. IHC/VanderStelt was interested to broaden its supply base from the South of India to the North where growing conditions for many high-altitude medicinal plant species are favourable. IHC/VanderStelt was particularly interested in procuring cultivated Kutki from small-scale producers in Uttaranchal. Because of the CITES conditions only certified cultivated Kutki can be imported and marketed, and this is not available in the European market. To make this possible, KIT, IHC/VanderStelt and a local processing and export company called Himalaya Organics Inc., agreed to support jointly the cultivation of Kutki by small-scale producers in Uttaranchal.

The Kutki chain that is being established has two axes: a commercial chain and provision of additional (public) assistance to the direct chain actors (Figure 2). In the commercial chain IHC/VanderStelt has committed itself through a partnership and export contract with Himalaya Organics, to buy agreed-upon amounts of products. The two companies have a preferred supplier/buyer status, which implies that the two parties always consult each other in the case of business opportunities. IHC/VanderStelt guarantees the farmers a minimum purchase for a period of 8 years at a minimum price that is based on the farmers' income from traditional crops in the area[2]. The actual selling price will be based on the agreed minimum price and the prevailing European wholesale price of Kutki at the time of delivery. In addition, IHC/VanderStelt pays a 10-20% price premium on the cultivated Kutki, which is being invested in a social community fund. This fund will be used to set up socially useful projects, which will be identified by the farmers and their association.

Initially, the project involves 50 small farmers. They will organize themselves in a farmers' association, with which Himalayan Organics will sign a contract. When the Kutki crops mature (in about 3 years) the farmers will supply their produce to Himalaya Organics. The role of Himalaya Organics is twofold: it is the preferred exporter for Uttaranchal, as well as the source of assistance to the farmers' associations. As the preferred exporter, it guarantees the product quality since it collects the raw material directly from the growers. It will also arrange for the processing of Kutki at local facilities. In addition, Himalaya Organics will identify the services that farmers require and facilitate contacts with services providers. Himalaya Organics is in the process of signing a Memorandum of Understanding with the High-Altitude Plant Physiology Research Centre (HAPPRC) to provide assistance with species domestication and the production process. HAPPRC is an important research centre in Uttaranchal that has developed cultivation technologies for a number of medicinal plant species. Himalaya Organics also focuses on issues of equity in the chain. The company facilitates the formation of the social fund.

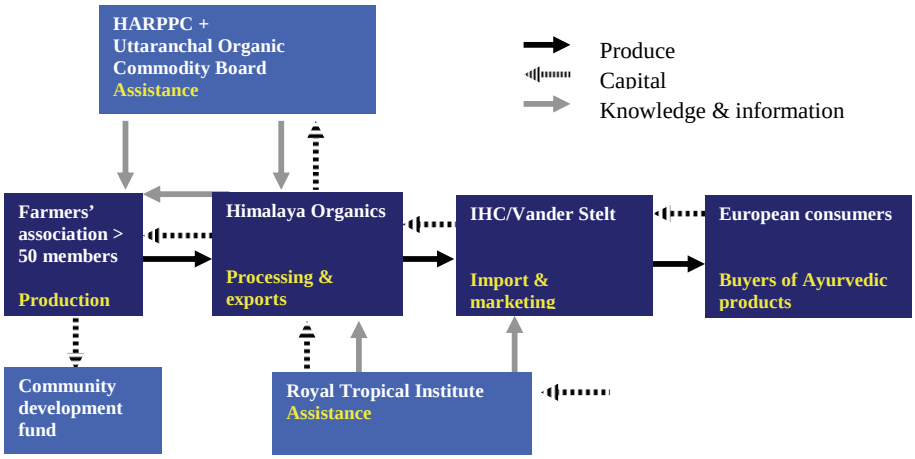

Figure 2. *Chart of Kutki medicinal plant chain*

The Royal Tropical institute is providing backstopping to Himalaya Organics, particularly to ensure the long-term sustainability of the chain and maximum effects on poverty alleviation. In this respect particular attention is being paid to ensuring the participation of small producers in the chain, and monitoring the impacts of Kutki cultivation on land, food security, labour and gender. In addition, KIT supports the documentation of lessons learnt and the dissemination of information to various interested parties. The intellectual ownership of the joint venture lies with Himalaya Organics Inc., IHC/VanderStelt and KIT Royal Tropical Institute.

DISCUSSION AND CONCLUSIONS

At present, resource-poor people in Uttaranchal collect plants from the wild to

complement their limited incomes. Continued collection and increasing market demand have led to numerous plant species being threatened with extinction. This has a particularly negative impact on the incomes of the poorest sections of rural societies. For rational and regulated collection, strong local communities or strict governmental control measures are necessary. The first is not in place in Uttaranchal, while collection control regulations tend to affect the poorest households hardest and push them into illegal, risky ventures. This brings us to the possibility that the cultivation of medicinal plants offers a great opportunity for the poor people of Uttaranchal. It is important that the potential of cultivation of medicinal plants is investigated and the possibilities of public–private collaboration are explored through action research programmes. It is also important to focus this research on issues that affect the livelihood of the poor, including farmers with small landholdings, income opportunities for women, and food security of the poorer section of rural society.

In spite of considerable government efforts, large-scale cultivation of medicinal plants has not yet taken place in Uttaranchal. The main factors limiting farmers' interest in the cultivation of medicinal plants include: the long gestation period and high risk; no secure domestic market and price premiums for cultivated material; poor institutional infrastructure to provide technical and marketing support; high transaction costs and insufficient social capital.

The example cited in the paper illustrates that public–private collaborations provide a promising mechanism for establishing the conditions necessary for sustainable cultivation of medicinal plants. The case shows that all parties are likely to benefit from the partnership: farmers have guaranteed access to markets, receive a price premium on cultivated material, have reduced risk, lower transaction costs, access to services and capacity strengthening of their organizations. IHC/VanderStelt has access to larger production volumes of organically produced and traceable raw materials, and Himalayan Organics has a secure export market that enables it to operate as a socially responsible and environmentally friendly enterprise. For KIT Royal Tropical institute this initiative provides an opportunity to achieve its wider goal to stimulate growth in rural areas while supporting social equity, environmental sustainability and sound economic development.

The case shows the importance of public-sector investment in pro-poor chain development. Besides securing a market for producer organizations there is a need to create the infrastructure necessary for the provision of technical and marketing support to small-scale producers and strengthening their organizations. Currently, there is an absence of service providers who can assist farmers with technical support. While a number of research institutes are working in Uttaranchal on medicinal plants, their contribution to the development and diffusion of technology has been limited. So far, little information is available on which species can be planted under different and specific ecological conditions. At the same time, few cultivation practices have been identified that have been proved to work in farmers' fields. Similarly the lack of suitable-quality planting material is a major problem for farmers who are ready to take up cultivation of medicinal plants. Through a direct involvement of a research institute (HAPRRC) in the initiative, this public–private collaboration strives to improve the communication between researchers and

farmers. We hope that this will ensure that both researchers and farmers benefit from mutual expertise and experience. This would also provide the researchers with a better understanding of the difficulties faced by the farmers.

Himalayan Organics is not only a business partner in the commercial chain, but it also performs – with public support – most of the functions necessary to strengthen farmers' capacities to benefit from the chain. It assists farmers with organizational and management issues, including their registration as certified cultivators. It also arranges planting material, facilitates access to technical and marketing support, and extends support in the formation of the social community fund.

One of the limitations of this initiative is the strong dependence of farmers on the international market. In order to reduce this dependence, KIT and Himalayan Organics are making attempts to establish market linkages for cultivated medicinal plant material in the domestic market. However, at present the private sector in India seems to be largely satisfied with the supply of medicinal plans, whether legally or illegally obtained. Although large exporters may be interested in offering contracts to farmers for the cultivation of species that are difficult to obtain and whose supply fluctuates, or for species that require transparency and documentation in the chain, their role in providing an impetus to the cultivation of these species is likely to be small. This is for two main reasons. Firstly, compared to the domestic market, the overall importance of export is small. This limits their overall influence on the chain. Secondly, it is still possible to export banned medicinal plants by using names of species whose export is permitted.

It is important to mention that the cultivation initiatives like the one we have described here are unlikely to reduce the collection of threatened species from the wild significantly. The collection from the wild is likely to remain the major source of supply, particularly for the domestic market, in the near future. Therefore, simultaneous efforts are needed to give the communities greater control over their resources and to have stricter enforcement of the regulations. Also, it is vitally important that more research is done on sustainable collection to minimize the damage associated with collection activities. At present, Uttaranchal's experience with public–private collaboration to promote the cultivation of medicinal plants by small farmers is at an early stage. It is hoped that these collaborations will provide important lessons that can be replicated in Uttaranchal and other mountainous areas. This would provide strong impetus to agricultural diversification, leading to increased incomes for farmers, and provide impetus to the efforts to conserve valuable but threatened species of medicinal plants.

NOTES

[1] Ayurveda is 4500-year-old health-care system, recognized by the World Health Organization.

[2] This formula has been made in consultation with farmers as there is currently no market and price for cultivated Kutki and for them their main concern was to earn at least as much as for their current crops.

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