

Policy brief

End uses of Kutki (*Neopicrorhiza scrophulariiflora*) in Nepal

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Kutki (*Neopicrorhiza scrophulariiflora*) is a medicinal herb found in the Himalayan region of Nepal. Government of Nepal has prioritized Kutki for research and economic development of the country. Its rhizomes have medicinal properties, so they have been used locally for human healthcare and are highly traded. What end uses are driving its market demand is unknown. Understanding end uses of plant species is essential for prediction of future demand of the species and planning for its harvesting sustainability. However, nothing is known about its industrial demand, end-products and their consumption. Recent published researches by Kafle *et al.* (2018a, b) have contributed in exploring these in Nepal. A Danish Ministry of Foreign Affairs-funded research was carried out from July 2016 to July 2017 by the author and the team to explore the industrial demand of Kutki, manufacturing of their consumer products, legal provisions for its trade and conservation, and consumption of its consumer products in Nepal.

Telephone interview was conducted with representative of herbal manufacturing industries using structured questionnaire and checklist in November 2016 to find out the industries that processes Kutki. A total of 2313 herbal products were surveyed for Kutki as an ingredient in 38 retailer shops of Bharatpur and Kathmandu, Nepal to find out the consumer products containing rhizomes of Kutki, and their manufacturers. Then,

representative of processing industries of Kutki in Nepal were interviewed using structured questionnaire and checklist. A consumer survey was conducted among purchasers and consumers (patients) of consumer products (Ayurvedic medicines) containing Kutki ($n = 513$) in five different cities of Nepal using structured questionnaire and checklist to explore characteristics of consumers and consumption of its consumer products. An online survey ($n = 58$) was also administered using structured questionnaire to explore reasons for choosing Ayurvedic medicines by consumers in Nepal.

Need for expansion of herbal manufacturing industries and regulation of export

There were 23 herbal industries manufacturing 45 types of Ayurvedic medicines as consumer products containing Kutki. Herbal processing and manufacturing is still in its infancy in Nepal, though herbal industries have a great scope of providing employment and developing new natural products that can fetch better prices in international markets (Subedi and Ojha 2002). The volume and value of annual demand of its dry rhizomes in Nepal was found 6076 kg and NRs 8573236 (USD 83235.30) respectively in 2015/016 with average 264.17 kg/industry and NRs 1410.87 (USD 13.69) per kg. Despite changing legal regulation, trade and consumption of Kutki exist in Nepal. The analysis of

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government data shows that 224.635 tons of Kutki entered into legal trade during 2010–2016 (6 years period) in Nepal, with average of 37.44 tons/yr. The government's official records show that the total volume of dry rhizomes of Kutki exported to India, after receiving CITES certificate, from Nepal during 2015/016 period was around 28 tons (DoF 2016). Though the export figures vary, these data indicate higher levels of export of dry rhizomes of Kutki from Nepal than the volume of domestic consumption. Demand for *Picrorhiza kurroa* (a species with common trade name as Kutki) is continuously increasing in India, e.g. an annual growth rate of 12.9% was recorded for its demand of 220 tons in 2001–2002 and 317 tons during 2004–2005 (FAO 2005). China is apparently a major consumer of Kutki (Olsen 1998). Its domestic industrial consumption was found insignificant in comparison to their harvested volume in trade, and should not be considered a major threat to this species.

Need for diversification of herbal products

The utilization of Ayurvedic medicines containing Kutki for treatment of health disorders of human is prevalent in Nepal. Men and women consumers of diverse ages and with different socio-economic profiles were found to consume Ayurvedic medicines containing Kutki to treat health disorders associated with different organ systems of body. The consumers receiving Ayurvedic medicines containing this species were child, adults and elders ranging from 1 to 98 years old (mean 37.6 years). Employed and unemployed, educated and illiterate consumers were found to consume Ayurvedic medicines containing Kutki to treat their health disorders in Nepal. The first three health disorders for which more patients receive Ayurvedic medicines containing Kutki for treatment were digestive system disorders, hepatobiliary system disorders, and respiratory system disorders. Consumers receiving those medicines were from households having diverse annual cash income

levels. The purchase and consumption of Ayurvedic medicine containing Kutki was most often guided by a doctor's prescription. Most of the respondents believed that the prices of those Ayurvedic medicines were fairer than other types of medicines. Similar studies are recommended in other countries like India and China where Kutki is exported from Nepal.

Ayurvedic medicines are believed to bring harmony and balance in mind, body, spiritual well-being and social welfare of human. The reasons for preference for these medicines are of great interest for exploration. Fewer or no side effects, preference to natural way of healing, belief regarding healing of disease, ease of access (availability and cost), and advertisement and recommendation from others were the major reasons that the consumers chose Ayurvedic medicines. In case of Ayurvedic medicines containing Kutki, majority of the consumers believed that these medicines have fewer or no side effects, can cure illness particularly for long run of chronic diseases, were cheaper than allopathic medicines, were easily available to purchase and were recommended by family members. Healing was not successful in past from allopathic and other types of medicines of majority of the consumers who preferred to consume Ayurvedic medicines containing Kutki. Further scientific studies and interventions are recommended for concerned health authorities and nursing practitioners of Nepal to test and validate the safety and effectiveness of the consumption of Ayurvedic medicines.

Health care value chain framework of Kutki (*N. scrophulariiflora*) in Nepal

From the analysis of the market change of medicinal and aromatic plants from previous studies (Edwards 1996; Olsen and Helles 1997; Olsen and Bhattarai 2005; He et al. 2018; Pouliot et al. 2018), a common chain of actors is found: harvesters collect medicinal plants from wild habitat, they sell these to local traders either directly or through sub-local traders, local traders

then sell these to central wholesalers either in Tarai or Kathmandu, then central wholesalers sell these to regional wholesalers in India. None of the prior studies have presented the market chain beyond central wholesalers within Nepal except Olsen and Helles (1997) indicated processors that bought medicinal plants from Tarai wholesalers to export the processed materials from the medicinal plants. What is the market chain beyond central wholesalers within Nepal up to consumption of end products is unknown. In this context, a simplified value chain model of *N. scrophulariiflora* within Nepal (Figure 1) is presented with empirical investigation by building on health care value chain framework (Burns 2002).

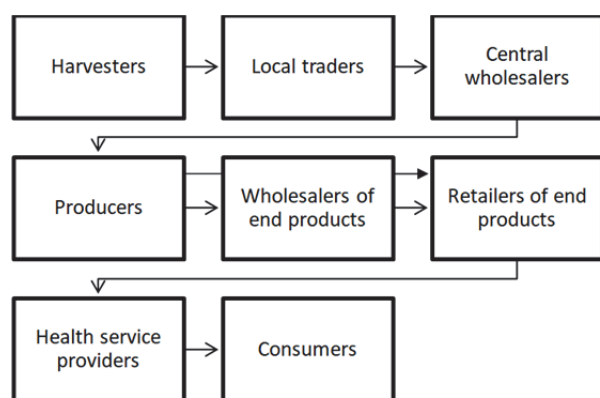


Figure 1. A simplified health care value chain framework of Kutki (*N. scrophulariiflora*) in Nepal

Harvesters collect rhizomes of *N. scrophulariiflora* from wild habitat; they sell these to local traders either directly or through sub-local traders, local traders then sell these to central wholesalers either in Tarai or Kathmandu. The central wholesalers sell these to manufacturing industries (hereafter producers). The producers then manufacture Ayurvedic medicines putting *N. scrophulariiflora* as ingredients. The industries supply Ayurvedic medicines to wholesalers and, sometimes directly to retailers (mainly Ayurvedic pharmacies). Mostly, the wholesalers sell these medicines to retailers. Medical representatives play role in order management of the medicines. The individuals experience incidence of health disorders. After incidence of health disorders, the

patients (consumers) now choose Ayurvedic system of treatment method based on certain reasons of choice. After choosing treatment method, the individuals consult with health service providers and get checked. Thus the patients receive prescription of Ayurvedic medicines from the health service providers. The patients or their family members purchase prescribed Ayurvedic medicines from Ayurvedic pharmacies as per prescription. Some consumers directly purchase the Ayurvedic medicines containing *N. scrophulariiflora* over-the-counter without prescription. The patients consume the purchased Ayurvedic medicines to treat their health disorders.

Key policy recommendations

1. Diversifying the consumer products of medicinal and aromatic plants to contribute to national economy while promoting consumer benefits in Nepal.
2. Creating conducive environment for growth of manufacturing industries for medicinal plants within the country as a national priority.
3. Regulating the export of high value medicinal and aromatic plants (e.g. *Kutki*) while meeting the domestic demand and maintaining sustainable growing stock.

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