



Tropentag 2007
University of Kassel-Witzenhausen and
University of Göttingen, October 9-11, 2007

Conference on International Agricultural Research for Development

Local Medicinal Flora and Associated Indigenous Knowledge: A Method for Sustainable Development in the Garhwal Himalaya, Uttarakhand, India

Pavlos Georgiadis^{a*}, Volker Hoffmann^a, Gopal S. Rawat^b, Vandana Shiva^c

^a University of Hohenheim, Institute for Social Sciences of the Agricultural Sector, Department of Rural Communication and Extension, Schloss, Museumsflügel, 70599, Stuttgart, Germany

^b Wildlife Institute of India, Post Bag #18, Chandrabani, 248 001, Dehradun, Uttarakhand, India

^c Navdanya, Research Foundation for Science, Technology and Ecology, A-60 Hauz Khas, 110016, New Delhi, India

Introduction

The identification and documentation of plants of ethnomedicinal importance in many cultures has long been an active area of research and has been connected with various objectives. However, almost no studies have sought to understand local medicinal floras and indigenous knowledge as methods for sustainable development in their corresponding localities. In India, ethnobotanical work hitherto has been largely qualitative and is often literature-based or based on very brief fieldwork (JAIN, 2002).

The mountains of Garhwal lie on the central Indian Himalayan zone and represent a distinct phytogeographic region, which provides natural habitat to the majority of medicinal plants recorded in the Indian Himalayan states (CALA, 2004 and CALA ET AL., 2006). It is a mosaic of numerous mountain ranges, hills and valleys, which accounts for a diversity in microclimates and vegetational wealth. By virtue of its geophysical features and topographic peculiarity, Garhwal is a distinct socio-economic district with special problems. These are marked by high transaction costs that are considered to be the major bottleneck of development. The region is economically and industrially underdeveloped, with¹ many villages that do not have basic infrastructure for electricity and communications. As a result, Garhwal has been home to a people that have evolved its unique culture through a constant interaction and interdependence with local biodiversity.

The study investigates the status of the medicinal flora and the associated indigenous knowledge in Garhwal and assesses their potential as a method for sustainable development and livelihood improvement in the region. It records ethnobotanical data preserved among the local population and communicates the perspectives of the different stakeholders involved in the conservation and development of the medicinal plants sector in the area. The work is not merely extractive and the results are immediately fed back to different agencies working for biodiversity conservation, sustainable development and protection of people's rights in the region.

* Corresponding author. Email: pgeo@uni-hohenheim.de

Research Methodology

Direct observations, group discussions and life with communities were performed in order to understand the way of life on the hills of Garhwal. Through this, information on the demographic, cultural and socio-economic background of the researched villages was recorded. Empirical research involved the use of Participatory Rural Appraisal (PRA) tools (SILVERMAN, 2005). These included interaction with practitioners of traditional medicine and herbarium collections during guided forest walks in order to compile the inventory of local medicinal plant resources. The main criterion for choosing villages for these tasks was the presence of knowledgeable persons with experience in identification and preparation of plant-based medicines. Such persons are either herbal healers by profession, or amateurs who are practicing Ayurveda on a voluntarily basis. Free interviews were taken so as to extract raw data regarding the properties and uses of local plant species as well as the perceptions and social attitudes towards the collection and use of wild plants. Herbarium specimens were collected and respective high-resolution digital photographs were taken and used for the identification of the species of interest.

Semi-structured interviews using herbarium specimens in a random sample of folk people have been engaged so as to assess the status and distribution of indigenous knowledge among the local population. Locations in varying altitudinal and/or ecological zones and degree of accessibility to roads, markets and hospitals have been the criteria for the selection of five villages for the purposes of this survey. In every village, 24 randomly selected informants belonging in four age groups were asked to identify a set of 20 to 25 locally common medicinal plant species from the compiled herbarium. Arrangements have been made in a way that prevented gender and age bias during interviews of three men and three women of each age group. A data matrix was constructed to score the answers given for each species in a total of 120 interviews. One point was given for each correct identification of a plant with its local name. Similarly, one point was given when a correct medicinal use was mentioned for each plant. In cases where the informant was giving a miscellaneous use but not a medicinal use, half point was given. Data collected during this process were fed back to the healers and practitioners for triangulation. The final scores were summed and averaged accordingly to give the percent knowledge skills in identification and medicinal usage of local plants.

The potential and challenges for development in the region was investigated through interviews and discussions with the various stakeholders of the sector. Free interviews and discussions with peasants, farmers and coordinators of NGOs were useful for the documentation and analysis of the different perspectives on community-based approaches for harvesting, cultivation, post-harvest processing, value addition, marketing and conservation of medicinal plants. The set of different opinions on the issue was complemented through interviews with officers in state government extension and development agencies. These discussions were oriented to extract information on official policies and initiatives taken at the regional, state and national level, with a particular attention given on the assessment of the present institutional infrastructure and the identification of any gaps.

Results and Discussion

The compiled inventory documents uses of 251 medicinal plant species, which belong in 80 families (Figure 1). It is the result of a systematic treatment of the recorded taxa and presents the valid scientific and vernacular nomenclature, associated authorship and synonymy, plant habits, parts used and altitudes (Figures 2a & b). This data is a contribution to the Community Biodiversity Registers of the partner NAVDANYA, a movement of organic farmers that takes action in seed saving, protection of community rights and rejuvenation of indigenous knowledge through education and knowledge dissemination.

The majority of the recorded species are herbs which grow in the wild, associated with oak and *Rhododendron* forests, forest edges and clearings, open meadows, sloppy ravines and waste places inside and nearby villages. This largely herbaceous vegetation is threatened by forest fires and by uncontrolled over-harvesting. Out of these, 103 can be found in cultivation in crop fields, home yards, in forestry or associated with places of religious importance. These plants have an important role in the life of the people in Garhwal. Different plant parts have various uses in medicine, nutrition, agriculture, as fuel and animal fodder, as well as mystical and miscellaneous uses. The ethnomedicinal knowledge associated with these plants is mainly kept in a number of knowledgeable persons that are present in the villages and is transferred through oral tradition from generation to generation.

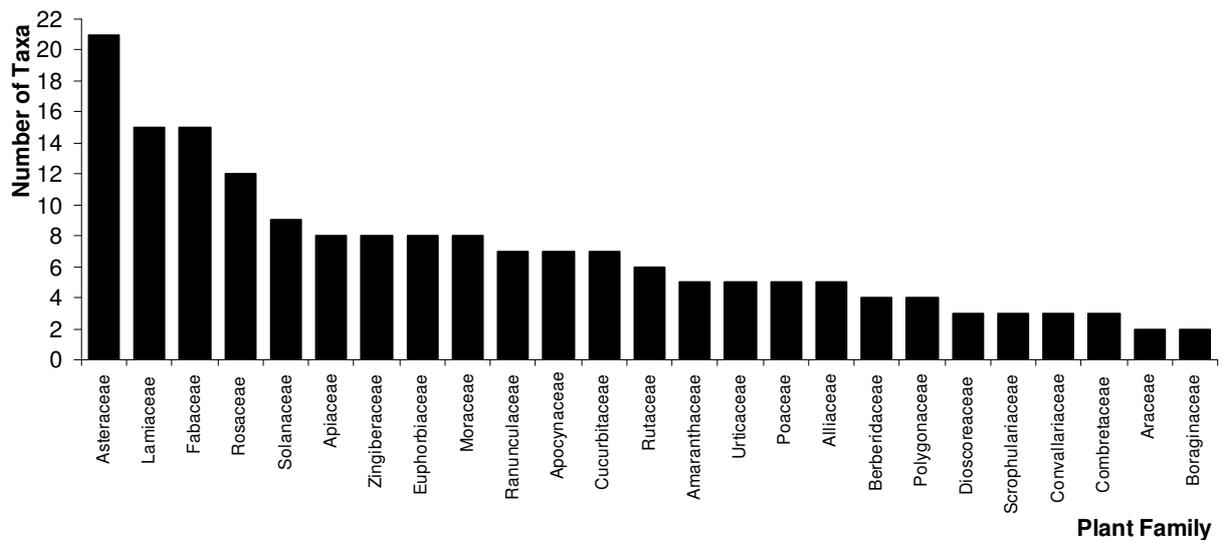


Figure 1: The 25 plant families with the most medicinal and aromatic species recorded in Garhwal.

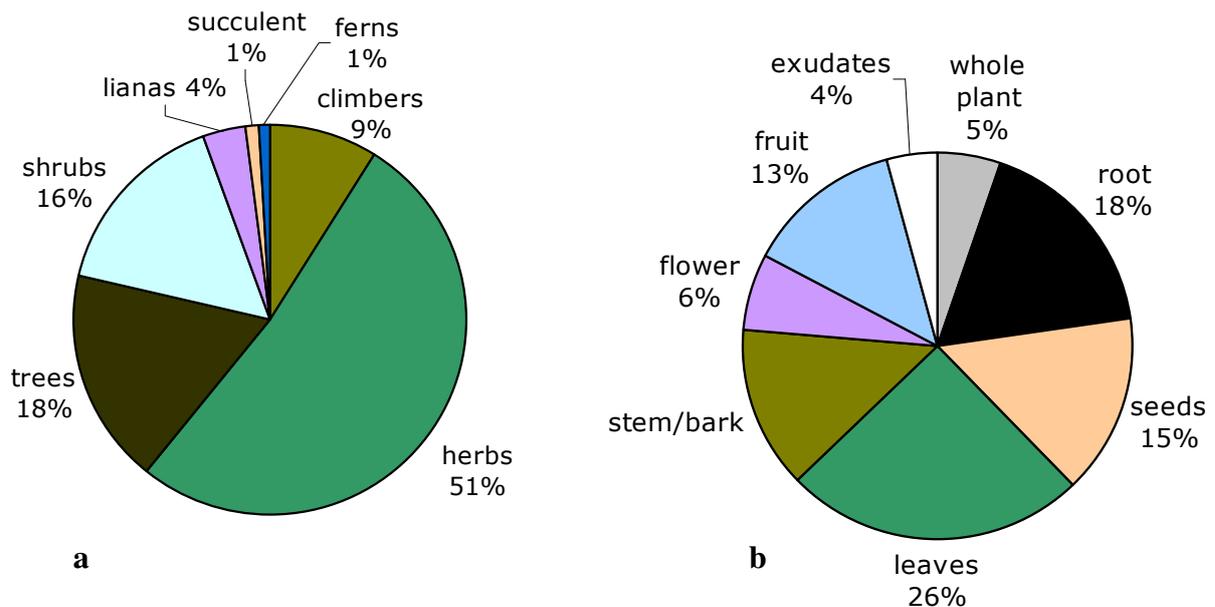


Figure 2: a. Distribution of the recorded species by plant habit. b. Break up of the percentage of medicinal and aromatic plants by the parts used in traditional medicine.

A survey on a random sample of the folk population revealed that indigenous knowledge is kept by older members of the local communities (Figure 3a). The presented results can be used as initial data for future studies regarding the status of the indigenous knowledge in the region. A significant amount of skills in the identification of plants is kept by the women of Garhwal (Figure 3b), which spend a considerable part of their day in the fields and collecting plants from the local forests. A comparative analysis of the data gathered in two villages whose economy depends on different resources made evident that vital for the preservation of the rural knowledge base is the dependence of the local population on its local plant biodiversity (Figure 4a & b).

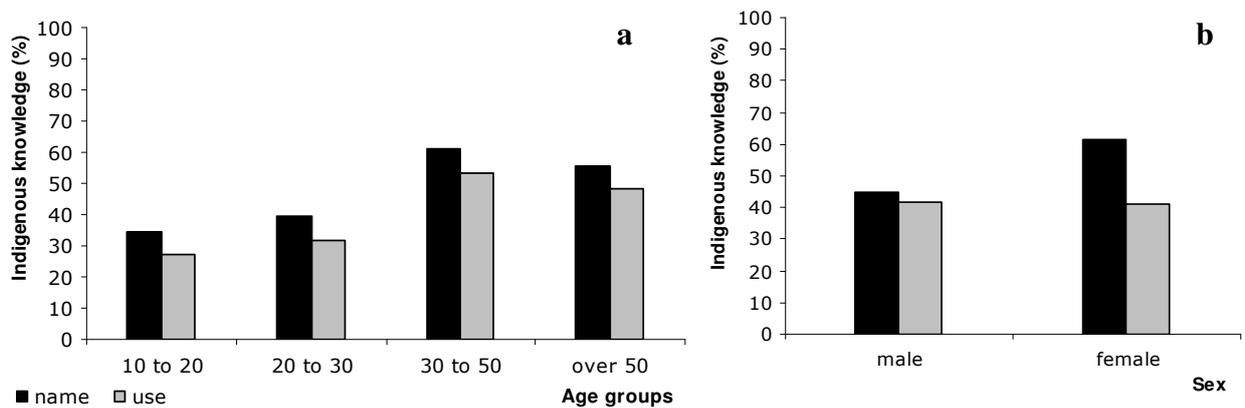


Figure 3: a. Distribution of indigenous knowledge on plant names and medicinal uses across different age groups of the folk population of Garhwal. b. Sex-wise distribution of indigenous knowledge on plant names and uses.

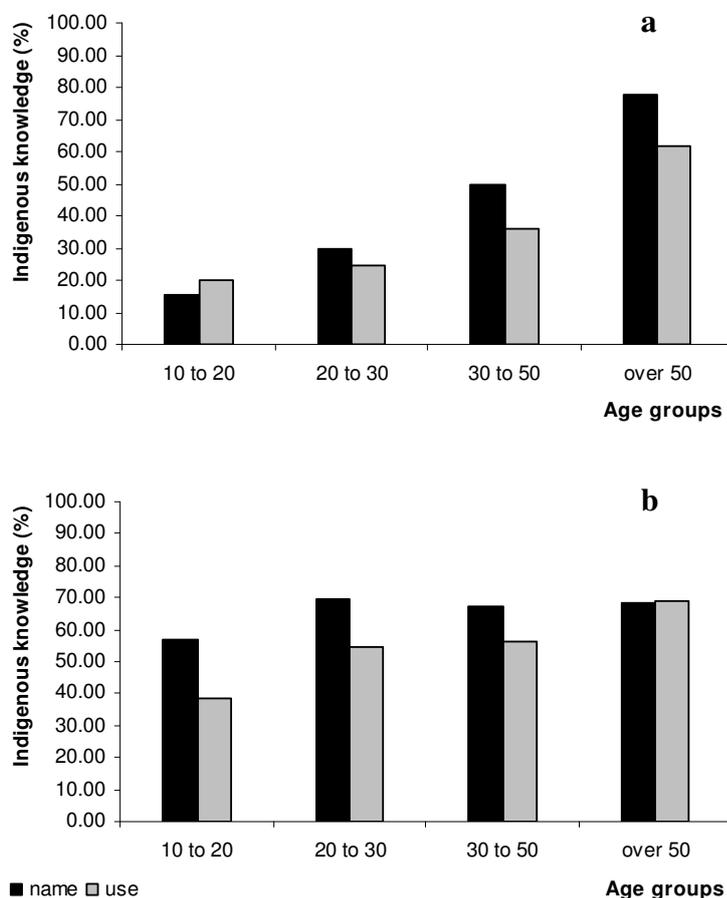


Figure 4: Age-wise distribution of indigenous knowledge on identification and medicinal uses of plants in two villages with different socio-economic conditions. a. Village Mana (Chamoli District) is only inhabited during the summer months, due to severe winters. The main income of the inhabitants comes from handcrafts -especially woolen products and carpets- and tourism. b. In village Kontha (Rudraprayag District), the population is engaged with the typical rural life of Garhwal. The local economy is based on subsistence agriculture and the inhabitants live in constant interdependence with local plant resources.

The ethnobotanical heritage of Garhwal has attracted during the recent years the attention of researchers and extension officers working towards its conservation and sustainable development. At the national and state levels, India has an inclusive approach to traditional medicine. This takes the form of a National Medicinal Plants Board, whose promotional and commercial schemes provide funding and guidance for conservation, research and development and capacity building. The state government of Uttarakhand has identified the importance and the potential of medicinal plants as a capital for development of its rural areas and has put forward the ambitious plan to make the state a strong player in the medicinal and aromatic plant related market. The state features the first public organic certification body in India and has been declared an 'organic' state. In addition to the government interventions, there is a well established network of locally acting NGOs who are mainly dealing with agriculture, but often extend their activities in health care, women empowerment, infrastructure and risk management.

Conclusions and Recommendations

Natural resources form an integral part of the Garhwal Himalayan ecosystem and whenever any strategy for the development of this mountainous region is in place, its geographical limitations pose many challenges to the planners. Thus, one has to keep in mind the existing facilities in the area. Projects planned to uplift hill economy should work on certain issues related to all these capitals: ecological and social. This requires strategies and a sound financial infrastructure designed in such a way that are efficient, but also simple and up to the convenience of the ordinary people. The people of Garhwal do not only have a rich and age-old plant related culture and knowledge base. They are highly adapted to the harshness of the environment and are masters in the labour-intensive agriculture of the hills. The variation in altitudes counts for a large habitat diversity, which makes possible the cultivation of many medicinal and aromatic plant species according to the demand. All these, combined with the institutional infrastructure in place raise the potential for the formation of a decentralised marketing system which will be based in collective cultivation and post-harvest value addition, controlled by market demands and conservation needs. A major challenge for the realisation of this model of development is the joint action of the involved stakeholders in a coordinated and transparent manner. Such a system is expected to evolve into a scheme that will generate alternative income, conserve local biodiversity and preserve indigenous knowledge.

In a region with such intimate relationships between people and local plant resources, the conservation of wildlife and the preservation of indigenous knowledge and culture are imperative. Indicators for development in Garhwal should include factors related to the status of indigenous knowledge among the rural population. Innovative approaches for the revitalisation of the knowledge base should involve the youth. The current research identified young people with exceptional skills in plant identification and utilisation. These persons will become the nucleus of NAVDANYA's newly formed volunteer team of 'Young Leaders in Barefoot Taxonomy and Biodiversity Conservation', which will deal with data collection and knowledge dissemination in their villages. This venture is expected to revive knowledge in the household level through the development of Community Biodiversity Registers and through NAVDANYA's school programmes.

The basic thrust for the realization of a scheme in Garhwal, which will be based in sustainable production of raw materials and will rejuvenate indigenous knowledge should be to serve the under-privileged, submerged, illiterate and marginalized people of the Himalaya. Local medicinal plants as a highly saleable concept and the associated indigenous knowledge as a selective advantage can be the methods for self-directed, sustainable development that is based on human dignity and respect for the environment. Looking ahead, such a vision could lead in making the Garhwal Himalaya an international 'herbal' destination, a place of origin of certified organic plant-based materials, where every piece of land is used efficiently and there is a job for every

hand. The successful implementation of such a vision can be exported and applied as a model for development in any social system operating in a compatible context.

Acknowledgements

Gratitude is expressed to the Eiselen Foundation Ulm for the financial support of this work. Many thanks are also due to NAVDANYA and its people for the ethical and logistic support during fieldwork in India.

References

JAIN, S.K. (2002). Bibliography of Indian Ethnobotany. Pp. 1-144. Sci. Publ., Jodhpur, India.

KALA, C.P. (2004). Revitalizing traditional herbal therapy by exploring medicinal plants: A case study of Uttaranchal State in India. Proceedings of an International Conference on Indigenous Knowledge: Transforming the Academy: 27-28 May 2004, Pp. 15-22. Penn State University, Pennsylvania, USA.

KALA, C.P., DHYANI, P.P. AND SAJWAN, B.S. (2006). Developing the medicinal plants sector in northern India: challenges and opportunities. Journal of Ethnobiology and Ethnomedicine, 2: 32-46.

SILVERMAN, D. (2005). Doing Qualitative Research: A Practical Handbook. Thousand Oaks: SAGE, London, UK.