

Medicinal and Aromatic Plants Network (MAPs-Net) Nepal: An open access digital database

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In Nepal Himalaya, about 1800 medicinal and aromatic plants are used (Shrestha *et al.*, 2001; Baral and Kurmi, 2006) for subsistence and economy. The usage of the plants as subsistence for folk therapies was largely influenced from traditional medicinal health care systems namely Ayurveda, Amchi, Chinese, etc. (Bhattarai, 1998). Up to 50% of the Nepal's rural household's income is derived from collection and trade of medicinal plants (Edward, 1996). Medicinal plants from Nepal were traded across the borders to Tibet as early as 600 AD (Sung and Yiming, 1998). It was estimated that an average of 20000 tons of raw materials, made up of 125–178 medicinal plant species (Srivastava, 2009).

The challenge at hand for medicinal plant conservation in Nepal Himalaya is to use the information collected through *ad hoc* researches (Kunwar *et al.*, 2010) and to ensure that all stakeholders, from local communities and land managers, to national governments and regional policy makers, are aware of the importance of medicinal plants and their status, and to ensure that they act to prevent their destruction or damage through ignorance or indifference. In this connection, present database aimed to promote knowledge management, cross regional learning and information sharing among concerned stakeholders on conservation and wise use of the medicinal and aromatic plants and to identify, mobilize, and convene key stakeholders to develop a functional and forward looking network on information and knowledge sharing, research methodology development and awareness raising activities.

Medicinal and Aromatic Plants Network (MAPs-Net) Nepal, an open access digital database aims to collect, collate, analyze, validate, verify, authenticate and serve the data/information of all medicinal and aromatic plants of Nepal for promotion, knowledge management, cross regional learning and information sharing on conservation and wise use of medicinal and aromatic plant resources. It also aims to build a vibrant and active network among the stakeholders.

Materials and methods

Both desktop review and peer review were done for referencing about 500 documents related to MAPs cultivation, trade, markets, processing, etc. Most items of literature were cited from the Internet, journals and books, and they were considered as valid. Theses, reports and brochures were also consulted. Field visits and cross-checking were done in Pokhara, Chitwan and Nepalgunj in October 2008. Most of the institutions of medicinal and aromatic plants were visited and their publications were reviewed. The gleaned information were analyzed, cross-checked and verified by consulting the expert panel and advisor board member of MAPs-Net, and uploaded with incorporating suggestion and feedback looped. Regular data uploading and updating was moderated by Ethnobotanical Society of Nepal. Specimens of the selected medicinal plants deposited in Tribhuvan University Central Herbarium (TUCH), National Herbarium, Godawari (KATH), The Natural History Museum (BM), Royal Botanic Garden Edinburgh (E), and Tokyo University Herbarium (TI) were reviewed. Based on the distribution records of the specimens, the GIS maps of each specimen/species were plotted. Workshops and meetings were held to collect

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feedback from various stakeholders and share progress among them. Medicinal and Aromatic Plants Network (MAPs-Net) Nepal as a consortium and its open access digital hub was developed during 2008 and 2009.

Medicinal and Aromatic Plants Network (MAPs-Net) Nepal

MAPs-Net, an open access digital hub, was developed to promote knowledge management, learning and sharing on conservation and wise use of the medicinal and aromatic plants. The hub is accessible at <http://www.eson.org.np/maps-net.htm>, describing under following five headings; home page, activities, prioritized species, board members and databases.

MAPs-Net Nepal home page

The homepage describes a short note of Medicinal and Aromatic Plants Network (MAPs-Net), Nepal.

MAPs-Net Nepal activities

Past, present and future activities of the MAPs-Net Nepal are available in this field.

Prioritized species

Although MAPs-Net Nepal has prioritized collection, collation and authentication of information of all medicinal and aromatic plant species of the country, a phase wise strategy has been made to incorporate all the medicinal plant species in the database. In the first phase, the most important 37 species were sorted and their database was prepared and uploaded. In the second phase, additional 34 species were prioritized in order to cover all the prioritized species of Conservation Assessment and Management Planning (CAMP) Pokhara 2001 and research, cultivation, trade and conservation priority species identified by the Government of Nepal.

MAPs-Net board members

MAPs-Net Nepal is a consortium of professionals working on promotion of medicinal and aromatic plants of the country. It coordinates cultivators, producers, collectors, traders, processors, exporters, academicians, policy makers and users. During technical data analysis, national experts as well as MAPs-Net advisory board members were interacted.

There are 11 MAPs-Net Nepal advisory board members in total.

Medicinal and aromatic plants database

There are about 1800 vascular medicinal and aromatic plants in Nepal (Shrestha *et al.*, 2001; Baral and Kurmi, 2006), the database incorporates minimum datasets: taxon name, family, vernacular names, synonyms, parts used, distribution, elevational range, pictorial presentation, etc. of about 1600 species of medicinal and aromatic plants.

The database also contains full-fledged datasets of 71 important medicinal and aromatic plant species of Nepal. The full-fledged datasets of each species have been managed to present in six different sub-headings: taxonomy, ecology, uses, market, conservation and management, and references and remarks. Each sub-heading has various sub-units. Taxonomy incorporates authentic name of the taxa, author citation, synonyms, vernacular names, life form, habitat, key distinguishing features, description, macroscopic characters, chromosome number and phenology. Ecology covers species origin, distribution worldwide, distribution inside Nepal, GIS maps and other distribution records. Uses sub-heading narrates parts used of the species, medical system where it is used, ethnobotany and other uses, chemical constituents, pharmacological actions, ayurvedic products, organoleptic test, etc. Market inside and outside country, trade volume, form and price, value addition, processing, published news and related links, etc of each species are under market sub-heading. Conservation and management sub-heading infers conservation status, government royalty for collection, *ex situ* and *in situ* conservation measures, sustainable harvesting guidelines, related stakeholders and publications of each species. Reference and remarks sub-heading includes cited literatures, suggested readings, credits and acknowledgement s. Each sub-heading was furnished with charts, photos and sketches. Links and archives of the species were also managed.

Medicinal and aromatic plants database management

Medicinal and aromatic plant network (MAPs-Net) Nepal consortium was developed since June 2008. Since, the consortium has been managed as an easily open access digital hub <http://www.eson.org.np/>

maps-net.htm for assemblage and collation of medicinal and aromatic plants data and information. Data collection, analysis and webpage moderation has been managed by Ethnobotanical Society of Nepal, with support from International Center for Integrated Mountain Development (ICIMOD). MAPs-Net Nepal has recently been endorsed by Herbs and NTFPs Coordination Committee (HNCC), Government of Nepal and from 2010, the network activities were complemented jointly by ESON and HNCC, Nepal. As there are similar digital hubs in other countries of south Asia, network among them would be quite productive.

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