

Biodiversity and indigenous knowledge system*

Biological diversity is an asset of vital significance to human beings, as it provides food, medicine and industrial raw materials along with an immense potential for accruing many unknown benefits to future generations. The areas rich in biodiversity are also an abode of diverse ethnic groups possessing a valuable reservoir of indigenous knowledge system (IKS) acquired and developed during a long period of time. A rapid pace of development in the regions populated by tribal communities and amalgamation of tribal societies with mainstream societies has led to a threat of gradual erosion of indigenous knowledge base, accompanied with an imminent danger of bio-piracy of valuable resources and knowledge systems. Therefore, an integration of traditional knowledge with modern scientific developments by value addition is an essential requisite for successful application of IKS for economic welfare of the tribal societies.

In view of growing interest among the scientific community about biodiversity conservation and its sustainable use, and immense economic potential of IKS, a two-day national seminar was organized recently to chalk out a future road map for sustainable utilization of biodiversity and appropriate protection of precious IKS of the tribal society. During six technical sessions of the seminar, twenty-one research papers were presented under the following two broad themes: (a) Biodiversity conservation and sustainable utilization of resources and (b) Linking indigenous knowledge on bio-resources with Intellectual Property Rights

Chowna Mein (Govt. of Arunachal Pradesh) in his inaugural speech stressed on the necessity of evolving a broadly acceptable mechanism for conservation and sustained utilization of biological resources, adequate representation of local tribal communities with regard to conservation or sustainable development, the importance of community-level innova-

tion techniques and policies for improvement and scientific validation of the IKS.

P. G. Rao (RRL, Jorhat), in his keynote address, mentioned that current global demand for herbal medicines is approx. 54 billion USD and countries like Finland and Switzerland with 1100 and 2700 plant species are earning 22.06 and 30.27 million USD respectively, whereas India with 8000 plant species is earning significantly lower amount. He suggested that to reap the optimum benefits of biological resources, emphasis should be given on survey and documentation of plant wealth, selection of priority species for different altitudinal zones and identification and characterization of chemical compounds in medicinal plants.

S. Ganeshan, Tropical Botanic Garden and Research Institute (TBGRI), Thiruvanthapuram, while deliberating on National Biodiversity Act (2002) emphasized the need for fair and equitable sharing of the benefits of commercialization of IKS. He presented a case study of the Kani tribe, in Kerala, who possess indigenous knowledge about the anti-fatigue properties of a wild plant species, *Trichopus zeylanicus*. This valuable knowledge of the tribe has been successfully translated into a scientifically validated drug 'Jeevani', by the efforts of TBGRI. An arrangement of the equitable sharing of the benefits of commercialization of this drug involves a share of 50% of the license fee and royalty for the tribe. Ganeshan suggested that Rajiv Gandhi University, Itanagar should take the lead and establish an IPR cell, so that the rich wealth of IKS of tribal communities can be protected effectively from undue exploitation.

Joy Dasgupta (ICIMOD, Nepal) delivered a lecture on various aspects of Convention on Biodiversity (CBD). He opined that the term 'sustainable development' needs an unambiguous definition, which is acceptable to all the signatories of the CBD. He pointed out that the CBD does not attach adequate importance to tribal and indigenous communities. Therefore, a few modifications are required in the CBD to include certain clauses for protecting the unique cultural diversity and IKS of ethnic communities.

B. N. Saha (Naharlagun Station, RRL Jorhat) presented a glimpse of the huge

potential of the northeastern region with regard to essential oils and flavour and fragrance compounds. In 2004, the market potential for essential oils and natural flavour and fragrance compounds was 18.4 million USD. This market is continuously growing at an annual rate of 10% for essential oils and 4–5% for flavour and fragrance compounds. Cosmetic industry and aromatherapy are other emerging areas for developing entrepreneurship in the NE region. Saha informed that the present marketing system for herbal products in the NE region is not catering to the needs of the poor and marginal farmers. Therefore, a centralized cooperative marketing system for medicinal and aromatic plants and plant-based products is an immediate requirement for promoting medicinal plant farming in the NE region.

M. M. Goswami (Gauhati University) focused his presentation on the vast potential of the NE region for aquaculture product. He pointed out that there is 39–80% deficit in production of aquaculture products in the NE region. This deficit can be overcome by utilizing the large areas (93,815 ha) of Beels/ox-bow lakes. He further stated that about 20,500 ha area of the NE region is currently under unscientific utilization pattern and a significant increase in production can be achieved by training the farmers to adopt modern scientific techniques of aquaculture.

L. N. Kakati (University of Nagaland) presented an account of the diversity of sericigenous insect ecosystem and habitat level. He suggested that severalfold increase in yield of silk can be obtained by preparing a distribution map of silk moths and their habitats, evaluation of the qualitative aspect of food plants of silkworms and hybridization of wild species of silkworms with superior ones.

S. C. Mondol (Jadavpur University) highlighted the present global market for plant-based drugs and assessed the potential of the NE region as a hub for manufacturing of herbal drugs. He mentioned that in order to become a key player in the global herbal drug market, a strict quality control on plant-based drugs is required.

Lanunmawai (Mizoram University) opined that tribal communities in the NE

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region, have their own indigenous mechanisms for conservation and utilization of bio-resources. Therefore, an active participation of the tribal societies can complement the efforts initiated at State or Central Government level.

D. Saha (Calcutta Patent Office) summarized the important aspects of Indian patent law and described the scope for patenting an innovation under the present patent law. He acquainted the participants with the procedural aspects of filing a patent. There were suggestions from the participants for amendment of the present patent law to allow patenting of processes and product base of IKS.

Two traditional healers from Arunachal Pradesh also shared their views about the present state of biodiversity and IKS in the state. Kaling Borang elucidated the importance of a few plant and animal species in the rituals of the tribal societies. He cited an example of the red-breasted squirrel which is gifted by the Adis to the bride's family during the marriage ceremony. According to tribal norms, the number of squirrels to be gifted is four; however, presently up to 500 squirrels are gifted. During the recent past, the number of red-breasted squirrels has dropped significantly due to indiscriminate killing. Borang stated that the use of

modern hunting gears like air guns and air rifles have aggravated the problem of conservation of rare species.

The seminar ended on a satisfactory note as it has opened up avenues for collaborative research on various fields of biodiversity among the participants, experts and representatives of different universities and research institutions.

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MEETING REPORT

Open access and developing countries*

Free access to the world's research literature is the prize that is being sought by all who understand the need for sharing the results of publicly-funded research, without which many solutions to the world's problems will be delayed. To this end, a workshop on 'Electronic Publishing and Open Access: Developing Country Perspectives' was held recently. Some 30 experts met at the workshop for two days of intense discussion.

Participants from India, China, Brazil and South Africa were joined by other experts from Ethiopia, Germany, Japan, UK and USA, to consider ways to accelerate the progress of the international open access movement towards free access to essential scientific literature. The main aim of the workshop was to consider a national policy document for developing countries that could be used by governments or their science-funding organizations to speed up the scientific progress.

After a welcome address from S. Chandrasekaran (Secretary, Indian Acad-

emy of Sciences, Bangalore), N. Balakrishnan (Indian Institute of Science (IISc), Bangalore) spoke about the exciting 'million books' initiative, partnered with China, which aims to preserve valuable publications for posterity, using new technologies such as artificial intelligence to overcome language problems. He asserted 'What we need to do is change the "developing country" rhetoric to a world perspective'. This was followed by a thought-provoking keynote address by Lawrence Liang (Alternative Law Forum), who discussed the knowledge commons and the need to protect essential publicly-funded information from commercial barriers. He invited us to resist a property discourse that conflates property rights with academic rights and turns the collegiality of academe into the hierarchy of property. He argued that no one could 'own' knowledge and that the greatest scientists were often called 'gifted', implying that their contribution was given to the world openly. The concept of selling such knowledge was alien to the academic world. Property in the English sense, he said, the conflation of 'self' and 'own' resting on exclusion, is something not common to other languages. In Hindi, 'apnapan' is not a matter of owning, or property, but of closeness. Ownership in this sense has the obligation of care.

Barbara Kirsop (Electronic Publishing Trust for Development, UK) gave an overview of why developing countries should adopt open access, providing per-

suasive recent statistics that showed the rapid growth in the quantity of material currently available free to all. Alma Swan of Key Perspectives, a consultancy that has carried out a number of basic studies on the use and impact of open access policies, showed how the digital age is changing how science is recorded, evaluated and assessed. She had analysed the way scientists choose to communicate their results, their reasons for doing this and how they are responding to the open access development. Open access allowed science to progress faster, provided new data-mining opportunities, and gave funding agencies far better returns on their research investments. She highlighted the need for mandated policies to ensure rapid deposit of research publications. These two presentations made clear the great benefits to researchers, their institutions and their governments of an open access policy.

Abel Packer described the established SciELO system that provides open access to the content of 350 journals from Latin America, the main aim of which was to raise the visibility of research from this region. The system is publicly funded, based on a network of partners, has achieved a great increase in citations, and finds that users return to the system regularly. He advocated building on the Salvador Declaration for Open Access for Developing Countries.

The second day began with a presentation by Zu Guang'an on journal publishing

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