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**Indigenous Knowledge Systems and Intellectual Property
Rights: An Enabling Tool for Development with Identity**

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Abstract

This paper deals with a subset of indigenous knowledge systems called ethnobotanical knowledge. It reports some creative ways in which documentation of ethnobotanical knowledge can be carried out without losing community ownership over intellectual property rights. It also presents the general findings of the documentation, current and future uses of the documented knowledge, and how this knowledge can become an enabling tool for development with a sense of community ownership and self-identity.

Background and Rationale

Indigenous peoples around the world have sought knowledge of physical reality throughout the ages. Their understanding of the physical universe is codified in their indigenous knowledge systems. A major component of these systems is ethnobotanical knowledge, which refers to a cumulative body of traditional knowledge about the interaction between human societies and the plant kingdom, and, more specifically, how indigenous peoples perceive, manage, and utilize the plants around them. Largely oral in nature, ethnobotanical documentation is one way of capturing this body of knowledge in written and graphic form.

In 2003-2004, an ethnobotanical documentation project was conducted in the Subanen community in Lakewood, Zamboanga del Sur, western Mindanao in the Philippines (hereinafter referred to as “Lakewood”). The documentation was carried out as a result of converging interests between the Subanen tribal leadership and the participating organizations.

The interest in ethnobotanical documentation among the Subanen was first articulated in their ancestral domain management plan (ADMP)², which was formulated in 1998 with the assistance of the local NGO, Ipil Development Foundation Lakewood Consortium (IDF). This ADMP identified the documentation of plants within the ancestral domain as a necessary input to improving their agriculture, food security and literacy programme. In 2001, Lakewood was one of the areas covered by the IFAD-funded Western Mindanao Community Initiatives Project (WMCIP) managed by the Department of Agrarian Reform (DAR). The WMCIP project and the DAR had a special fund for a biodiversity study to

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² ADMP is a management plan created by every indigenous community that has been granted a certificate of ancestral domain claim by the Philippine Government as a formal recognition of their rights over their domains. The plan provides a framework for the management, protection, and utilization of natural resources within the ancestral domain.

improve natural resource management. With the support of an IFAD technical assistance grant (#486), the World Agroforestry Centre (ICRAF) also became involved in 2003 and collaborated with WMCIP-DAR to provide support in establishing a learning site for sustainable agriculture and natural resource management. Building on common interests and concerns, the Subanen Tribal Council, the IDF, WMCIP-DAR and ICRAF joined together to carry out ethnobotanical documentation in the Subanen community at Lakewood.

The pursuit of ethnobotanical documentation in Lakewood was an urgent response to the rapid loss of plant biodiversity and genetic resources and the associated loss of ethnobotanical knowledge. The forest cover of the Subanen's ancestral domain had receded due to massive timber extraction by big logging companies in earlier decades, followed by the exploitation of the forest for agricultural purposes.

The tribal leadership of Lakewood recognized that their oral ethnobotanical knowledge risked being forgotten. Few plant experts remained among the communities and even they acknowledged that their knowledge of biodiversity was much more limited than that of the previous generation. Environmental degradation had been accompanied by an erosion of ethnobotanical knowledge.

A more dramatic problem faced by the Subanen is the ongoing threat that the diverse genetic rice varieties found in their domain will be destroyed by extreme climatic changes. This has prompted the documentation and conservation of rice morphology. The Subanen are seed-keepers of genetically diverse upland rice varieties – in Lakewood alone, the Subanen were able to name close to 100 rice varieties. In 2001, 75% of the rice varieties disappeared from the community, after the Subanen rice growers failed to replant their seeds due to a year of drought (1997-1998) and three consecutive years of heavy rains (1998-2001). Living in extreme poverty and facing hunger, some rice-growers were forced to cook their last remaining seeds. Situations of this kind threaten the priceless germplasm, necessary for global food security, with extinction.

The loss of biodiversity, genetic resources and ethnobotanical knowledge is compounded by the problem of cultural erosion. As societies *in transition*, the younger generations of Subanen are increasingly being drawn into mainstream society through formal education and exposure to mass media. Their assimilation into the mainstream poses the risk that oral ethnobotanical knowledge will no longer be passed on to the next generation. There was a general consensus that ethnobotanical knowledge must be documented before it vanished forever.

While systematic documentation captures and preserves orally transmitted knowledge for present and future generations, it exposes indigenous communities to the risk of losing their intellectual property rights through piracy and commercial exploitation. Cognizant of this, a documentation team, consisting of indigenous community members and participatory organizations, developed creative ways of documenting oral ethnobotanical knowledge while protecting the intellectual property rights of the community.

Approaches to Ethnobotanical Documentation and Protection of Community Intellectual Property Rights

The ethnobotanical documentation exercise carried out in Lakewood used multidisciplinary and participatory research methods that were sensitive to local culture and community intellectual property rights.³

Multidisciplinary documentation

The documentation team tapped the expertise of the following: (i) tribal plant experts, as the source of ethnobotanical knowledge; (ii) an agronomist from the University of the Philippines at Los Baños, for training and advice on the documentation of rice morphology; (iii) a forester and a botanist from Central Mindanao University for training and guidance on plant specimen collection, preservation and scientific identification; (iv) a legal expert to provide guidance on the issue of protecting community intellectual property rights; (v) a natural resource management specialist; and (vi) anthropologists/multimedia specialists to provide facilitation and packaging of various knowledge products.

Participatory documentation

The documentation activities were the result of consensus-building and converging interests between the involved organizations and the indigenous communities. The organizations empowered the communities by transferring technical documentation skills to both men and women team members to ensure that the Subanen community undertake as much of the documentation as possible with the organizations in the role of facilitator. The Subanen community members were involved throughout the documentation process from setting research priorities to data-gathering, processing, and the post-processing of knowledge products. The non-literate but knowledgeable community elders acted as information providers while the younger, literate community members worked as documenters.

Culturally-sensitive documentation

The ethnobotanical documentation was conducted with sensitivity to local culture. The participating organizations observed the customary rules and behaviour that had been requested while conducting documentation. The Subanen elders prescribed that ritual offerings must be made before entering each documentation site and a thanksgiving ceremony must be performed on completion. It was taboo to ask questions about matters that are considered guarded secrets and whose public revelation would be seen to compromise the well-being of the entire community. The role of community members as documenters simplified the observance of customary rules and behaviour as they were familiar with which areas were open to documentation and which were to be avoided.

³ For details on how ethnobotanical documentation was carried out in Lakewood and later on in Bakun, please refer to “Community Intellectual Property Rights Sensitive Ethnobotanical Documentation: A User’s Guide” by Vel J. Suminguit *in* Technical Assistance Grant 486 Completion Report: Programme for the Technical and Institutional Innovations and Implementation Support to IFAD Projects to Enhance Participatory Development of Upland Poor in South-East Asia (ICRAF: Los Baños, Laguna, the Philippines, 2005, Special Annex).

Documentation sensitive to intellectual property rights

Conscious of the need to protect the intellectual property rights of the community, the team used both informal and formal approaches.

A. Informal Approach

This entailed publishing the scientific name and generic use of medicinal plants but not detailing the recipe, dosage and specific illnesses for which it is used. In this way, outsiders were encouraged to seek permission first from the community, and come to a mutually agreeable arrangement before obtaining complete ethnomedicinal information for commercial purposes.

B. Formal approaches

- 1. Memorandum of agreement.** Any agreement reached during consensus-building should be recorded in a memorandum of agreement, a legally binding document signed by the involved parties and witnessed by the National Commission of Indigenous Peoples. The memorandum stipulates among other things that:
 - *Ownership of documented ethnobotanical knowledge remains with the indigenous community.* This provision is intended to protect community intellectual property rights.
 - *No biological specimens should leave the community without free and prior informed consent (FPIC).* This provision is designed to prevent biopiracy.
 - *Future commercial utilization of ethnobotanical knowledge, if any, would require FPIC.* This provision is intended to ensure that any economic benefits resulting from the documentation lead to the enhancement of the social well-being of the indigenous community.
 - *Participating organizations must observe customary laws in the conduct of documentation.* This entails the performance of a ritual to solemnize the agreement, signifying that consent was provided not only by the Subanen community but also by the unseen spirits believed to be dwelling in nature.
- 2. Digital encryption technology.** Electronic knowledge products were digitally encrypted to discourage unauthorized copying or printing of pages from digital photo albums or electronic books without prior consent from the tribal leadership, the copyright-holder of documented knowledge. Interested parties should secure a legitimate copy from the tribal council or its authorized distributors. Proceeds are returned to the community to assist them in their development initiatives.
- 3. Copyright packaged information.** Packaged information such as books, magazines, electronic albums and books are deposited and registered with the Philippine National Library, which serves as the repository and intellectual property

rights office of the Philippine Government under Republic Act 8293. The registration of the documented knowledge also serves as the *sui generis* registration of the various plants and rice varieties listed in the documentation. This ensures the Subanen's prior claim to the use of the documented plants, especially in the event that the identified use has commercial potential. However, registration with the copyright office protects the documented knowledge only, not the plant itself.

- 4. Plant Variety Protection Act.** Under the Plant Variety Protection Act (RA 9168), a Certificate of Plant Variety Protection may be granted to applicants for plant varieties that are new, distinct, uniform and stable. The rice varieties developed for generations by the Subanen are considered new and distinct because they do not yet exist in the global database of the International Rice Research Institute (IRRI).⁴ Through careful seed selection for a period of three to seven cropping cycles, uniformity can be established. The Subanen community, through the Tribal Council, may apply for a Certificate of Plant Variety Protection, which provides coverage for 20 years.

Outcomes of Ethnobotanical Documentation

Ethnobotanical documentation helps reveal the great potential of ethnobotanical knowledge as a key to largely untapped biological and genetic resources.

1. The Lakewood documentation team listed 568 plants, which represent 70% of plants growing in the ancestral domain. Digital photographs of over 400 of the listed plants are already stored in a database and close to 300 specimens were collected, dried and mounted for the Subanen herbarium. The exercise showed that ethnobotanical knowledge covers a wide spectrum of plant species such as trees, vines, herbs, shrubs, grasses, ferns, edible mushrooms, palms and mosses, most of which have multiple uses, for example, as medicine (62%), food (37%) and construction materials (20%).
2. Ethnobotanical documentation has revived the Subanen's interest in continuing the collection of disappearing rice seeds for in situ, on-farm conservation and documentation. In 2004, 38 varieties were collected and planted for their first cycle of morphological documentation. In 2005, 56 more varieties were added to the collection, bringing the total rice varieties saved from extinction to 82. Women are playing a vital role in this initiative as seed keepers and growers.
3. A large amount of culturally relevant educational material was produced and copyrighted in the name of the Subanen Tribal Council. Publications include printed books, magazines and digitally encrypted photo albums. These materials are being reproduced for use in the Subanen literacy programme.
4. There was a notable increase in the technical expertise of the Subanen members of the ethnobotanical documentation team (five women and eight men).

⁴ Professor Teresita Borromeo of the Department of Agronomy, University of the Philippines Los Baños, confirms that IRRI's global rice database contains only one variety from Lakewood collected in the 1980s.

5. A significant outcome of the exercise has been the adoption of its approaches in the documentation of plant diversity in the ancestral domain of the Kankanaey in Bakun, Benguet (also in the Philippines).⁵ After testing the Lakewood approach in Bakun, the regional office of the NCIP in northern Luzon entered into a memorandum of agreement with various government and non-governmental organizations in the region to carry out ethnobotanical documentation jointly in all ancestral domains within the Cordillera Administrative Region, using the Lakewood experience as a model.

Potential Uses of Ethnobotanical Knowledge

Ethnobotanical knowledge can serve as an effective development tool to improve the living conditions of indigenous communities without degrading the environment. It can be used to increase and enhance livelihood options, revitalize agriculture, increase food security, improve health and promote a sense of cultural pride within the community.

1. Increasing and enhancing livelihood options

- Many plants currently growing wild in the ancestral domain produce resin, natural dye, fibre, detergent and natural oil. Further detailed studies and field trials could be carried out on ways to propagate and process these plants to obtain commercial products.
- With close to 100 indigenous rice varieties in Lakewood, and probably more in neighbouring areas, the Subanen could become certified seed providers of indigenous rice germplasm for commercial plant breeders.
- Sixty-two per cent of the plants in the ancestral domain were listed as having medicinal uses. Chemical compounds of these plants could be identified for the production of organic medicine.
- The Department of Environment and Natural Resources is interested in indigenous tree species reforestation. However, it does not have a supplier of seeds and seedlings of indigenous tree species. More than 100 tree species are good quality timber trees in the ancestral domain of the Subanen that could provide such a source. With technical training in seed collection, processing,

⁵ The indigenous communities in Bakun were the first recipients of the Certificate of Ancestral Domain Title, a certificate similar to a private land title. Their ancestral domain management plan called for plant biodiversity documentation. Kankanaey tribal leadership was prompted to initiate ethnobotanical documentation after a member of the Lakewood documentation team shared his experience at a round-table discussion facilitated by ICRAF. The Bakun Indigenous Tribal Organization (representing the Kankanaey community) conducted their ethnobotanical documentation in partnership with the Cordillera Highland Agricultural Resource Management Project (cofinanced by IFAD); the local government unit of Bakun, the National Commission on Indigenous Peoples; the University of the Philippines Baguio; the Department of Environment and Natural Resources; Benguet State University; the Highland Agriculture Research and Development Center; and ICRAF.

propagation and nursery establishment, the Subanen could generate income from seeds and seedlings without damaging the current forest stand.

- In Bakun, edible mushrooms and ornamental plants are abundant. The Bakun Indigenous Tribal Organization is considering mushroom culture and ornamental plant propagation as an alternative to pesticide-intensive commercial vegetable-growing to tap the high demand from neighbouring major urban centres (e.g. Baguio and Manila).

2. Revitalizing agriculture and increasing food security

- Ethnobotanical knowledge helps the Subanen cope with periodic food shortages by utilizing non-timber forest products. During the exercise, the Subanen people named over 200 undomesticated plants that are edible for humans. When crops fail or when there is a food shortage during the lean season, especially before the coming harvest season, the Subanen harvest nuts, berries, wild vegetables and honey and hunt animals in the forest. The forest provides them with a buffer from hunger. However, the culturally important plants are usually heavily utilized without any corresponding regeneration activities. As a result, some have become rare or endangered species. Ethnobotanical knowledge can be used to identify heavily exploited plant species in order to initiate field trials and other regenerative activities.
- Some plants are already used for intercropping and soil erosion control, to serve as a trellis for climbing plants, and to provide insect repellent or organic pesticide. Using organic pesticide has the advantage over inorganic pesticide because it is locally available, biodegradable and affordable for small farmers. Technical assistance in processing organic pesticides from local raw materials could help reduce yield loss to pests and possibly open a new source of income for the indigenous community.

3. Improving health

The forest is the living pharmacy of the indigenous communities. It provides the medicines to cure common illnesses. However, medicinal plants in the forest are not always readily available when needed. Often they are only found in a specific part of the forest that may be distant and arduous to reach. This could be addressed by cultivating the identified medicinal plants in backyard or communal gardens making them more easily available, and thereby improving community health.

4. Source of culturally relevant learning materials to revitalize traditional culture

Proper documentation of ethnobotanical knowledge produces a written cultural heritage that can be passed on from generation to generation. As such, it can be a source of cultural pride for the Subanen that can help revitalize traditional culture. It is also a culturally relevant educational resource for the Subanen literacy

programmes as well as the mainstream formal school system. By incorporating ethnobotanical knowledge into the formal curriculum of the Philippine educational system, young indigenous community members can be given a chance to learn about and appreciate the richness of their cultural heritage. In this way, they might imbibe the importance of preserving biodiversity and protecting the environment. Similarly, non-indigenous students may have a better understanding of indigenous culture, thus promoting cultural dialogue and mutual comprehension to enhance peace.

Challenges and Opportunities

The results of ethnobotanical documentation, such as rice characterization, show great promise for a better, and more sustainable future for the Subanen. However, transforming their ethnobotanical knowledge of various plant uses into finished marketable products requires new technical skills and financial resources. Unfortunately, the Subanen, like most marginalized upland indigenous communities, live in a state of extreme poverty. With their highly dispersed community settlements, tribal leaders cannot even afford the opportunity cost of leaving their farms or the direct cost of food and transportation to meet to discuss plans for a common future. Even if there is financial assistance, the tribal leadership is not yet ready to directly manage such a fund on their own as most of them have little or no formal education and lack technical skills in financial management. Those with formal education seek employment elsewhere because of the lack of employment opportunities in their home communities. To unleash the potential of their ethnobotanical knowledge as a tool for development with some sense of ownership and self-identity, there is a need to enhance their skills to create employment opportunities in their communities. They need both short-term and long-term skills enhancement.

In the short term, hands-on training, especially among women, is needed in areas such as tree-seed collection and nursery establishment, food processing of wild fruits and spices, processing of herbal medicines, processing of organic pesticides, handicraft production, marketing of products and book-keeping. There is also a need to continue (and expand to neighbouring areas) documentation of rice morphology to obtain a complete inventory of genetically diverse rice germplasm and so that the rights of indigenous communities can be protected under the Plant Variety Protection Act. To protect rice germplasm from extreme climatic variations, in situ on-farm conservation should be supported by the establishment of a community seed bank.

In the long term, and to ensure the sustainability of activities, indigenous communities need assistance to produce idealistic young professionals with a solid education in areas such as genetic engineering, plant-breeding, botany, chemistry or pharmacology, food science, social science, law and financial management. Without committed professionals coming from their own ranks, they will be forever dependent on programme-based external technical and financial assistance.