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WIPO PANEL ON "INDIGENOUS AND LOCAL COMMUNITIES' CONCERNS AND EXPERIENCES IN PROMOTING, SUSTAINING AND SAFEGUARDING THEIR TRADITIONAL KNOWLEDGE, TRADITIONAL CULTURAL EXPRESSIONS AND GENETIC RESOURCES"

EXPERIENCES FROM BANGLADESH

JUNE 29, 2009

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* This document comprises the presentation in the form received from the presenter. Any views expressed in the presentation are not necessarily those of WIPO or any of its Member States.

INTRODUCTION TO THE ORGANIZATION FOR SOCIAL ACTION AND DEVELOPMENT (OSAD)

The Organization for Social Action and Development (OSAD)[1] in Bangladesh has, for more than a decade, been providing community services for public benefit. As a non-governmental organization (NGO), it promotes social entrepreneurship and awareness activities for livelihood security in terms of better nutrition, safe water and sanitation, education, public health, environment, habitat and renewable energy. It also promotes social business by mobilizing community resources, including money, time, social capital and enterprises. Core competency areas are thus biodiversity, social forestry, nursery development, raising horticulture/medicinal plants, environment club, fishery activities; IGA's; health and awareness programs, community empowerment, agriculture farming, informally promoting agro-based industries and child, adolescent and adult education.

The WIPO Intergovernmental Committee on Intellectual Property and Genetic Resources, Traditional Knowledge and Folklore (IGC) encourages the participation of indigenous representatives from the seven geo cultural regions recognized by the United Nations Permanent Forum on Indigenous Issues (UNPFII). OSAD is accredited to the World Intellectual Property Organization (WIPO) and has in this regard been working on issues related to intellectual property (IP) and traditional knowledge (TK), indigenous knowledge (IK) and folk life. It encourages the indigenous or local communities it represents in understanding the precepts and concepts related to the preservation, management, benefit-sharing and sustainable use of genetic resources, and providing training on the development and protection of intangible cultural heritage (ICH), a category that includes folklore and folk life. Presently, it is training the communities to document their folk life and creating together with them a public knowledge portal. In order to develop an understanding on IP and facilitate working on the issues, OSAD has established a new platform, *Samriddha Bangladesh* (Rich Heritage of Bangladesh), for the purpose of, among others, identifying the enriched ingredients embedded with its diverse art and culture and lifestyles, developing contents of local knowledge and assisting in setting values and standards of its own.

Being inspired by the exhibition *"At Home with Invention – Intellectual Property in Everyday Life"* that deals with intensive hands-on training in documentary techniques and archival skills for indigenous communities, organized by WIPO and the *American Folklife Center* (AFC) in June 1999, OSAD collaborates with other professional panels, such as *Development Initiatives for Inclusive People* (DIIP) to offer training to members of indigenous communities in documenting their own cultural traditions, archiving this heritage for future generations and protecting their IP interests in their recordings and documentations.

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OSAD'S PERSPECTIVES ON INDIGENOUS AND LOCAL COMMUNITY INITIATIVES IN PROTECTING TK, TCES AND GR – APPLYING THE PRACTICAL LESSONS OF COMMUNITY EXPERIENCE

Cultural Industries are Creative Industries

Conceptually, the term 'cultural industries' applies to those industries that combine the creation, production and commercialization of contents, which are intangible and cultural in nature. These contents are typically protected by copyright and they can take the form of goods or services. Depending on the context, cultural industries may also be referred to as "creative industries", sunrise or "future oriented industries" in the economic jargon, or content industries in the technological jargon (UNESCO).

TK/TCEs/GR

The unauthorized use of genetic resources (GRs) and the knowledge associated with these resources held by communities living in the countries rich in biodiversity, by industrial enterprises (mainly pharmaceutical companies) in the developed world, is often referred to as 'bio-piracy'. Having at one time referred exclusively to the monumental remains of cultures, 'heritage' as a concept gradually include new categories, such as intangible, ethnographic or industrial heritage. A noteworthy effort was subsequently made to extend the conceptualization and description of intangible heritage. This is because closer attention is now being paid to humankind, dramatic arts, languages and traditional music, as well as to informational, spiritual and philosophical systems upon which creations are based (UNESCO). Customary law may also be given some recognition in the protection of TK. Folklore is a component of the broader term of 'traditional knowledge' and is often used in association with copyright and related rights.

Things are interwoven, an IP-related issue or situation in one country is intrinsically related to another country, unless parenting of IP is done by its country of origin. IP archives are not there to source them, IP regime in all the countries are not properly IP-educated. All these issues very much impact the existing IP regime related to TK, GR and the patenting of life-forms, and are very much relevant to OSAD.

OSAD'S RELATIONSHIP WITH IP AND TK

Development anthropology today centers on the basic principal of 'development from below'. There is a need for common ground and trust building, taking into account the communities and their point of view, beliefs and circumstances, through a shared agreement, compromise and collaboration.

As a service-oriented NGO, OSAD works for the benefit of the community members, grassroots organizations and others. It is non-profit and organized outside the institutionalized political structures to realize particular social objectives for promoting self-help, community activation for development, environmental protection and biodiversity conservation. It also serves particular constituencies in hilly areas and among indigenous peoples.

OSAD's activities range from local organizational effectiveness, action research, training and development, education, information distribution and utility services at the community levels, advocacy, media campaigns for social change and networking. OSAD's size as a NGO may be smaller than others with huge membership groups, but OSAD is a flat organization, allowing innovations and flexibility to adept actions for learning at every step.

OSAD uses a community-based herbal garden as an entry-point, imparting training to the ethnic groups and motivating them for training to form a critical mass, so that they actively take part in development projects in a remote Lama in hill district Bandarban, Chittagong, Bangladesh. It helps organize farmers in the villages of Kapasia, Gazipur district. It is also helping rural communities in Nawabgonj Dhaka to have arsenic-free potable piped water. However, OSAD still needs to strengthen its dealings with IP matters further.

In any event, it remains committed to working together with Government and other NGOs/IGOs and donor communities at the national and international levels. OSAD also seeks to facilitate attaining the Millennium Development Goals (MDGs) with as end goal sustainable development. OSAD calls for a need to know 'what is nature', fuses the learning with knowledge already acquired, identifies gaps thereto – the missing links, *pseudo genesis* of the past-present course of actions and future directions.

At community levels, OSAD aims to 'empower traditional agricultural communities by facilitating and strengthening their own TK systems', the way Farmer First was organized in Thailand. With an expanded interest in the integrity and value of TK systems, it also facilitates development of information and knowledge, both tacit and explicit, and helps the social business to grow and foster the process by controlled peer-to-peer knowledge sharing of core information, knowledge, and 'know-how' and encourages individuals to share and disseminate their knowledge spontaneously to the learning organizations and communities.

Specific issues in the IGC and how to address these issues

The WIPO IGC was established to discuss IP issues related to TK, genetic resources and folklore. One of the objectives of the IGC was to discuss the possible development of an international instrument for protection, which would be of "*sui generis*" in nature.

Sui generis is a Latin phrase meaning "of its own kind". A *sui generis* legal system, for example, is a legal system specifically designed to address a particular issues and/or the needs and concerns of a community. Plant Breeders Rights in the UPOV Convention and the IP protection of integrated circuits as reflected in the Treaty on Intellectual Property in respect of Integrated circuits, 1989 ("Washington Treaty") are often cited as examples of *sui generis* regimes. In the context of TK, it refers to the unsuitability of the existing IP regime for protecting TK and the demand in some quarters of framing a specific legal regime for its protection.

At the IGC, OSAD is most concerned with specific issues, such as the provisions of bilateral investment treaties (BITs). Two governments and/or certain principles from the International Convention for the Settlement of Investment Disputes and/or the arbitration rules of the UN Commission on International Trade Law, the World Trade Organization (WTO), its Dispute Settlement Body, and its Agreement on Trade Related Aspects of Intellectual Property Rights (TRIPS), simply do not form part of this picture. The leverage that it gives TNCs could go very far.

In regard to the implementation of IP in developing countries "in accordance with the highest international standards", these standards are not defined, but they may relate to new standards being generated through investment treaties.

OSAD is an active partner of various global campaigns and remains committed to work with development partners in establishing a platform or a common ground for shared opinion, to address the issues on IK, GR and folklore. Membership with National and International Organization/Forum:

Name of Organizations	***Membership***
Credit Development Forum (CDF), Dhaka.	Member
NFE Working Group in Bangladesh.	Key Member
National Agro-forestry Working Group (NAWG), Dhaka.	Member
Nitrogen Fixing Tree Association (NFTA), Hawaii, USA.	Associate Member
International Society of Tropical Foresters (ISTF), Mary Land, USA.	Gratis Member
Standing Committee on Commonwealth Forestry, Edinburgh, Scotland, UK.	Affiliated
International Union of Forestry Research Organization (IUFRO), Japan.	Associate Member

OSAD also maintains relations with the *Bangladesh Resource Centre for Indigenous Knowledge* (BARCIK) and other professional bodies in Bangladesh for use of their technical inputs and resources. It has working relationships with the following donors, partners and stakeholders:

- Asia Partnership for Human Development (APHD), Hong Kong
- Bangladesh Agricultural Research Council (BARC), Dhaka
- Canadian Environmental Network, Canada
- Community Participatory Fund
- Dhaka Community Hospital, Dhaka
- Directorate of Non-Formal Education (DNFE), Dhaka
- Department of Fisheries (DOF), Dhaka
- Directorate of Public Health Engineering (DPHE), Dhaka
- Food and Agriculture Organization (FAO), Dhaka
- Homeless International, UK
- IDA
- SDC
- UNICEF, Dhaka
- USAID, Dhaka
- WB (World Bank)
- World Food Programme (WFP), Dhaka
- Arannyak Foundation
- Directorate of Public Health Engineering (DPHE), Government of Bangladesh
- Women's Environment & Development Organization, USA

OSAD's critical concern is domestic biodiversity and is therefore currently relating its work with amongst others indigenous knowledge (IK), traditional ecological knowledge (TEK), plant genetic resources, herbs, shrubs plants and trees and traditional medicine. OSAD always seeks to make people literate enough to grasp all the critical issues on IP-

related matters, as choice should always be left with the people ('popular democratic choice'), not to stretch campaign on dictated terms.

In 2003, Sushasoner Jonno Prochavijan (SUPRO), a nationwide network of small NGOs, campaigned against the WTO through people's mobilization, with 10 NGO co-organisers. SUPRO organized a campaign on 'Influencing Least Developed Countries' Ministerial Meeting in Dhaka on Preparation for WTO Cancun Conference – Campaign for Positioning and Impact on Globalization' within a very short amount of time and after planning for a long time to campaign against globalization and the WTO. Four international NGOs active in this field (OXFAM-GB, NETZ Bangladesh, Christian Aid and Action Aid) supported this campaign.

The campaign was held from May 30 to June 2, 2003, in parallel with the Dhaka LDC Ministerial Conference organized by the government of Bangladesh. The Conference was held to jointly prepare a common stance for the LDCs at the fifth WTO Ministerial Conference, held in September 2003 in Cancun, Mexico. The campaign's 10 co-organizers were *Unnayan Bikolpa Nitee Nirdharani Gabashana* (UBING), Odhikar, *Coalition for Urban Poor* (CUP), *Bangladesh Environmental Lawyers Association* (BELA), *Consumers Association of Bangladesh* (CAB), *Bangladesh Paribesh Andolon* (BAPA), *Center for Sustainable Development* (CFSD), Karmojibi Nari, *Society for Environment and Human Development* (SHED) and *Bangladesh Nari Pragati Sangha* (BNPS). The objectives of the campaign were to influence the position of LDC ministers in favor of the poor and marginalized strata of society and raise people's critical awareness on the WTO and globalization.

To fulfill the objectives of the campaign, SUPRO administered the following activities:

- Production of Development Communication Material:
    - In 2003, SUPRO developed a book on globalization, WTO and its impact on Bangladesh, with a view to developing critical awareness among the mass population. This book was distributed across the country through SUPRO's 590 local NGO partners.
    - It developed one easy-to-read booklet on the promotion and preservation of medicinal plants, to widen the spread of local knowledge so that there will be grassroots protection against TRIPS.
    - It developed a poster and a leaflet to publicize the event. These were distributed across the country for greater participation of the public.

- SUPRO organized media events to provide orientation to journalists in the electronic and printed media to make them aware of global trading, WTO and globalization – which made the development efforts of LDCs difficult, and convinced them to write and generate public opinion on the issue.

- It published a special supplement in popular weekly magazine Saptahik 2000 on globalization, WTO and its impact on Bangladesh and organized a Press Conference at the Dhaka Reporters Unity on May 30, 2003 to inform the journalistic community about the campaign plans and invite wider media coverage to sensitize the mass population.

- Campaign events include: Street demonstration against the aggression of the WTO with national political parties, NGOs and cultural organizations on May

30, 2003, demonstration of medicinal plants aiming to popularize the concept of "no patent and bio piracy" in central Shahid Minar with cultural program on food security and farmers right on May 31, 2003. Within the cultural program lecture, discussions were also held.

- National Convention was held at LGED Auditorium on June 1, 2003 with participation from national political parties, cultural organizations, activist groups and NGOs. Around 700 people participated in the Convention and prepared Dhaka Declaration through consensus of the participants.

The highlights of the Declaration are:

- We demand unity of LDCs at any cost.
- Agreements must be in participatory, transparent and accountable process.
- We demand access to product and labor in developed countries without any conditions.
- We demand commitment of developed countries on national and local industrial development.
- We demand quota facilities for at least 20 years so that Backward Linkage Industry can be developed.
- Impact assessment should be prior to implementing any agreement – Why we the LDC solely compensate.
- We do not accept commercialization of nation building service sectors, like education and health.
- Separate Subsistence Agriculture from Commercial Agriculture.
- We are against any patent on life forms.
- We are also against any IP rights on medicine.
- Stop conspiracy in the preparation of Bio-Diversity Act.
- Stop biopiracy in the name of research and human resource development.
- We demand implementation of human rights issues.
- No bow down to threats, believe in people's strength.
- Can Cancun realize people rights, need people movement.
- 700 NGOs, national political parties, CSOs, activist groups signed on declaration.

All printed and electronic media, including BBC, widely covered the campaign events. The campaign was successful in terms of popularizing the issue. SUPRO chalked out a Future Action Plan in response to the need of raising critical awareness on the WTO and dissemination up to down trodden people. These included, among others, a seminar in 45 districts with the active participation of SUPRO's partner on Globalization, WTO and its impact on Bangladesh. The objective of the seminar was to raise awareness on that very emerging critical issue and build people's opinion so that they will raise the issue to politicians to take proper stand.

- Designing Training Course on WTO for NGO leaders and civil society activist.
- Organizing National Seminar, Procession, Cultural Program on 13-15 September 2003 parallel with Cancun conference.
- Sending SUPROs representative to Cancun Conference.
- Linking with international network who raise voice against WTO.

Facing the challenges

The social pillar of sustainable development should fully recognize the human spiritual dimension and incorporate ethics and cultural values into sustainable development education. In this connection, trade unions questioned the ethics of privatization and deregulation. Women and indigenous peoples called for closer review on how ODA is spent. Ghana raised the issue of bio-piracy. Bangladesh supported the mainstream of the concept of sustainable development in national planning and expressed confidence in the role of the media to help ensuring this.

Many farmer-generated technologies from rice and fish production, to organic fertilizers to plant breeding were covered in newspapers, journals, books and publications. Frequently, the researchers failed to mention the name of the community or farmer responsible for an innovation. This may or may not occur due to lack of respect for the innovator. However, like other NGOs/GOs, OSAD strongly advocates the recognition and compensation of all farmers and farming communities for the technologies used. The *Indian Institute of Management* became quite active in the collection and documentation of TK in India. The Institute uses the Honey Bee newsletter to facilitate collection and distribution. This is a newsletter about farmer innovations that is translated into local languages using non-academic vocabulary. According to Anil Gupta, its editor, acknowledging the name of the farmer or community, providing feedback to the innovators in the form of any existing research on the innovation and finally providing compensation in some form to the farmers, which he envisages taking four basic forms:

1. Royalties.
2. Prizes and other honors.
3. Institutional support for TK.
4. Renegotiation of international copyright agreements for the farmers' benefit.

The knowledge is bound to the conditions set by the communities. Appleton and Hill observed that, 'the ability of the community, and people within the community, to gain and transfer knowledge is related, to a certain extent, to their level of education, availability of reading material, available time and access to mass media (newspapers, radio and television)'. As Shiva mentions, 'the modern scientific paradigm is a reductionist one in which a component such as water, seed and fertilizer become a unit of production in a 'factory'. Therefore, the farm as an integrated system disappears and the communities' approach is eroded. Development research, planning and policy are still dominated by the reductionist modern knowledge system.

CUSTOMARY LAW AND PRACTICES

Following the process of developing a *sui generis* law by the government of Bangladesh, the farmers and community rights on biodiversity will not be neglected. The second preparatory Committee of the World Summit on Sustainable Development included a multi-stakeholder dialogue segment from January 29 to 31, 2002, involving all nine major groups of Agenda 21 and governments. In the course of the dialogue, many governments supported suggestions for integrated efforts for sustainable development in formal and non-formal education initiatives, youth participation, access to scientific and technological information and data resources and cooperation among stakeholders and across sectors.

Farmers specifically stressed the need for governments to invest in agriculture and ensure access to land and resources. Scientific communities emphasized health and the need to focus more on medical research and population issues. Indigenous people linked poverty eradication to territorial security, economic and natural resource control, and supported self-determination of models of development to manage communities and recovery of ecosystems using traditional methods. Farmers' rights arising from their past, present and future contributions in conserving, improving and making available plant or animal genetic resources are virtually ignored in all respects.

MISAPPROPRIATIONS AND MISUSE

The long patent tenure under TRIPS is among the most contentious and hotly disputed items of the WTO. The Agreement deals with issues:

1. application of the agreement
2. protection of IP
3. enforcement of IP domestically
4. settling of IP disputes involving WTO members
5. establishment of transitional arrangements during the evolution of the new system (WTO, 2001: 2)

The TRIPS Agreement added computer programs and live performances (bootlegging) to literary and works of art under copyright, which offers protection for a minimum of 50 years. The inclusion of computer programs within copyright seems misplaced. Patents protection is for a maximum of 20 years (WTO, 2001: 4-5). However, patent holders must supply the products to the market to avoid revocation. Industrial designs protection lasts for at least 10 years (WTO, 2001: 4).

There are already numerous complaints over the piracy of bio-resources of developing economies. Unless the IP institutions are developed, enforcement will always be difficult (BBC, 1999). OSAD is convinced that 'unscrupulous regulations that are achieved through consensus building using horse-trading methods will do little to convince the developing economies about the role of WTO'.

Making an impact on the policy regime

OSAD is working on indigenous knowledge (IK). The difference is that TK *stricto sensu* refers to knowledge in public domain and is conceptually said to be 'a broader term as some TK may not have the characteristic of indigenous knowledge'.

As a strategy to activate community and sensitize the policy regime, OSAD works on a nationwide Campaign on Heritage Literacy with a sharp focus on IP literacy. Here, cultural diversity plays an important role allowing 'variety or multiformity of human social structures, belief systems and strategies for adapting to situations in different parts of the world'. This multiformity may give rise to unity in diversity, respect individualism in this individualistic world.

The WIPO guides aimed at small and medium-sized enterprises (SMEs) provide information on a range of IP tools including industrial designs, patents, patent information, copyright and related rights, trade secrets, licensing and IP valuation. While these guides are

mainly aimed at SMEs, they may be equally useful for policy makers, students, researchers, employees and any other individuals interested in basic IP principles from a business perspective. However, it is a challenge to raise awareness on these principles within the local communities without formal education. OSAD therefore takes the knowledge to them through its Campaign using a media-mix of folklore, song and dance, jatra (a traditional show-biz) and other means to get the right message through to the right audience.

In recent years, WTO measures on IP protection have come under attack from all corners of the globe. TRIPS requires all WTO members to grant and enforce IP rights on life forms. Specifically, it says that while plants and animals can be excluded from patent laws, all countries should allow for patents to be granted on microorganisms and possibly grant patents or an effective *sui generis* type of IP on plant varieties. Since its adoption in 1994, TRIPS has been severely criticized as it is the first international treaty to make the privatization of biodiversity compulsory – and to do so as a principle of international trade.

Yet TRIPS is only about minimum standards. And those minimum standards are clearly not strong enough for industrialized countries and transnational corporations (TNC). Developed countries are negotiating special closed deals with governments from the South to establish stronger requirements for IP rights on biological resources. These "TRIPS-plus" standards are being introduced through a range of bilateral, regional and sub-regional agreements. They take developing countries way beyond the commitments they agreed to under the WTO and they are making so much headway that TRIPS may soon be obsolete.

How to protect TK, GR and folklore?

In this sub-continent, a person is socially identified, first by his/her parent's names, second by nationality and third, by time and environment. To protect TK, genetic resources and folklore, IP management, collection, identification and coding at national, regional, and international levels may be done on the basis of 'country of origin', as experienced in immigration applications. An IP Archives Collection should be able to represent the wealth and diversity of an entire region. In the absence of such an IP Archives Agreement, NGOs sometimes hear what others say about IP rights that historically the wealth of knowledge of the 'biodiversity rich countries in the south' changed hands and are now being commoditized and commercialized by the biodiversity poor 'industrial enterprises in the developed world' where only the multi-nationals' business interest is being served.

APPLYING THE PRACTICAL LESSONS OF COMMUNITY EXPERIENCE

The tribal community people have got a store of traditional ecological knowledge (TEC), relating to ecological systems acquired by communities who are living in close contact, but one can hardly term it as TK innovations refer to knowledge that is not in public domain.

The United Nations initiated the International Model Law on Folklore with the intention to protect, recognize and compensate farmers for TK used by organizations. Sadly, the initiatives are yet effectively implemented. P.A. Fernandez of UNESCO (1994) recommended that 'a thorough investigation of the ramifications would be necessary before any project for documentation, evaluation and dissemination could be implemented'. He mentioned, 'clearly, this is an enormous task. Unfortunately, it is highly unlikely that that the

development organizations interested in TK systems, no matter how committed they are to respecting and understanding traditional communities, will have the time and resources to thoroughly investigate the implications of documentation and dissemination for all the TK that could be examined. Therefore, in situations where investigation of the implications is not possible the concept of quick documentation and dissemination must be considered because of the rapid modernization of the developing world and ensuring erosion and loss of TK systems.

In order to impact, participate and contribute to efforts at the IGC to define how to protect TK, genetic resources and folklore, OSAD seeks to spearhead a campaign, peer-to-peer e-learning, based on what is known on IP, linking it with community knowledge, i.e. the 'knowledge held by communities, characterized by common or communal ownership' and heritage. Relating it to agricultural practices and herbal gardening, the community has a wealth of indigenous knowledge on cultivar, the cultivated variety of plants. They practice traditional medicine and have their own knowledge base that include, for example, health practices, approaches, diverse knowledge and beliefs incorporating plant, animal and mineral based medicines, spiritual therapies, manual techniques and exercises, applied singularly or in combination to treat, diagnose and prevent illnesses or maintaining well-being. The irony is that those people do not have traditional resource rights. In a sense, it has a broad usage which include IP rights, but denotes broader 'bundles of rights' including human rights, land rights, religious rights and cultural property. The stories are abound of their deprivations from that 'bundles'.

Genetic Resources Action International (GRAIN) rightly terms heritage as a nation's or people's historic legacy that is deemed worthy of preservation. Inheritance is something that is passed on from one generation to the next, suggesting that heritage is outside the purview of buying and selling. This is what the Food and Agriculture Organization (FAO) had in mind when the concept of "common heritage of mankind" was developed in relation to plant genetic resources. The international farmers' organization *Via Campesina* launched a campaign to defend seeds as peoples' heritage for the service of humankind. This global campaign was launched at the *World Social Forum* in Porto Alegre, Brazil in 2003, where thousands of participants committed themselves to defending seeds as collective heritage, the basis of cultures and the foundation of farming and food sovereignty.

Biodiversity is considered at three different levels – genetic diversity, species diversity, and ecosystem diversity. Scientists have variously estimated that there are from 3 to 30 million extant (living) species, of which 1.4 million have been classified, including 250,000 plants, 750,000 insects, and 41,000 vertebrates; the remainder is invertebrates, fungi, algae, and microorganisms. It is estimated that over 50% of the world's species are found in the moist tropical forests, which cover only 5-7% of the earth's land area. A training module prepared by the M.S. Swaminathan Foundation for the FARM Program is designed specifically for use by both researchers and extension workers. The module consists of two introductory books on Biodiversity Indexing and Bioindicators; a supplementary manual on Biodiversity Indexing.

Biodiversity helps prevent the extinction of species and helps preserve the balance of nature. At the 1992 United Nations Conference on Environment and Development, over 150 nations, including Bangladesh, signed a treaty to preserve the planet's biological diversity. Unfortunately there is no proper inventory of the biodiversity of the country and primary data for most of the flora and fauna are far from complete.

Bangladesh has been endowed with a rich plant diversity base because of its fertile alluvial land, warm and humid climate. More than 6000 plant species occur in Bangladesh, of which 300 or so species are exotic and 8 are endemic. Ninety-five vascular plants have been rated as threatened of which 92 are angiosperms and 3 gymnosperms. About 300 species and varieties of algae have been recorded from freshwater habitats alone. There are many more in the brackish water and seawater habitats. The fungal flora has not been fully recorded. There are about 250 species of bryophytes in the country. Of the 250 species of pteridophytes that occur in Bangladesh, 230 are ferns. There are about 5000 species of flowering plants (angiosperm) in the country. Bangladesh has 4 species of gymnosperms; of these 3 are threatened (1 cycas, 2 gnetum).

In Bangladesh, rice is interwoven with Bangali culture. It is the symbol of wealth. Bangladesh has 3 species of rice: Oryza sativa, O. coaractata, and O. rufipogon. The country has 3 species of rice, of which there are about 10,000 varieties. The hard fact is that people can hardly name them. The traditional practices had been replaced with a new one without any trace of records of the past practices. Ask an expatriate Expert 'Where are they?' He will invariably make a reply, he have it all. You must pay to get them back.

A group of donors established the *Consultative Group on Inter-national Agricultural Research* (CGIAR) in the early 1970s to fund agricultural research around the world. It does this via 16 international agricultural research centers, which now call themselves "Future Harvest" centers comprising more than 8,500 scientists and support staff working in more than 100 countries. The CGIAR is the biggest institutional force guiding research and development for the crops that feed people in the South. As government funding is drying up, the CGIAR is increasingly looking to partnerships with industry to keep itself alive: hence its growing interest in research into GM crops.

Deepwater rice is a special variety in Bangladesh, grown in more than 50cm of water for one month or a longer period during the growing season. Based on stature and depth of water, these are of two types: (i) traditional tall and (ii) floating rice. Deepwater rice grown in Asia is a cultiver of Oryza sativa, probably evolved from perennial grass, Oryza rufipogon, via annual wild relative, Oryza nivara. There are more than 2,000 deepwater rice cultivars in Bangladesh and more than 6,000 in Asia. Almost all the deepwater cultivars are strongly photo-period sensitive. Photosensitivity fixes flowering time at a favorable point in the flooding period, enables the plant to escape the adverse effects of low temperature in the reproductive phase, and usually ensures crop maturity as soon as floods have receded. In Bangladesh, deepwater rice occupied 2.09 million ha (21% of the total rice area) in the late 1960s. Deepwater (floating) rice has three special adaptations: (i) ability to elongate with the rise of water levels; (ii) develop nodal tillers and roots from the upper nodes in the water; and (iii) the upward bending of the terminal part of the plant called 'kneeing' that keeps the reproductive parts above the water as flood water subsides http://banglapedia.org/HT/R_0198.HTM.

Many indigenous rice varieties have been lost due to the introduction of high-yielding varieties (HYVs). Wheat, Triticum aestivum, is now the second staple food crop of the country. Except for one indigenous strain all the plant genetic resources (PGR, 15,730) of common wheat have been introduced. Most minor cereals are of an endemic nature. There are a small number of foxtail millets, proso millets and others. In case of jute there are 958 accessions of Corchorus capsularis (Titapat/Sadapat/Bogipat). There are 10 annual oilseed

crop species having more than 1200 plant genetic resources (PGR). Brassica campestris (mustard) and B. juncea (rapeseed) are of both endemic and exotic origins. About 500 PGR of the species available are being used for the development of newer varieties. In addition, B. napus, B. carinata and B. nigra were introduced to Bangladesh during the early 1970s. Groundnut (420 PGR), soybean (145 PGR) and sesame (132 PGR) are the three other species of oilseeds. Soybeans of American types were introduced to Bangladesh during the early 1970s. Wild indigenous soybean PGR could be found in the Chittagong Hill Tracts. Recently, oil palm has been introduced into the country. Of the 7099 PGR of pulses and food legumes, 3463 are of local origin from 8 species, the rest imported. Bangladesh is known as the center of origin of sugarcane which has yielded many genetic resources: 459 Saccharum officinarum and 26 S. spontaneum PGR.

There are 33 common fruit species with a high number of PGR. A total of 463 variants of mango, pomelo, guava and jackfruit have been recorded in different institutes and orchards. The minor fruits usually come from 54 species that have 298 variants, of which 207 are of local origin. There are 52 species of fruit trees in the country that are wild in nature. There are three types of PGR that produce vegetables from roots and tubers (11 species), leaves (8 species) and fruits (20 species). These 39 species have more than 1000 PGR. The local collections of clones of tea are 246 and the introduced varieties amount to about 28. Coffee has three species but it is not yet a commercial crop in the country.

Bangladesh has been tentatively divided into 30 agro-ecological zones, which have been subdivided into 88 agro-ecological sub-regions. These have been further subdivided into 535 agro-ecological units. The main types of forests that occur in Bangladesh are the following: (i) Tropical evergreen and semi-evergreen; (ii) Tropical moist deciduous (inland soil forests); (iii) Tidal swamp forest; and (iv) Fresh water swamp forest. Because of the agro-ecological variations of the country people over the centuries have been cultivating, preserving, and using more than 1364 plant species coming from both endemic and exotic origins, for about 85 diverse uses. There are about 175 species of medicinal herbs. Many varieties of rice, jute, sugarcane, cotton, linseed, mustard, cucumber, bean, gourd, banana, mango have also been selected and raised by the people who have been living in this area for about 8-10 thousand years. A large number of flora are being cultivated in the homesteads. About 100,000 species of fungi have so far been recorded worldwide. The fungal flora in Bangladesh has not yet been fully recorded.

Sundarbans, the largest single block of tidal halophytic mangrove forest in the world, located in the southern part of Bangladesh. The forest consists of about 200 islands, separated by about 400 interconnected tidal rivers, creeks and canals. The Sundarbans was declared as a Reserve Forest in 1875. About 32,400 hectares of the Sundarbans have been declared as three wildlife sanctuaries, and came under the UNESCO World Heritage Site in 1999. The vegetation is largely of mangrove type and encompasses a variety of plants including trees, shrubs, grasses, epiphytes and lianas.

Besides the spectacular Royal Bengal Tiger, the other notable mammalian fauna are Spotted deer (Cervus axis), Barking deer (Muntiacus muntjak), Rhesus macaque (Macaca mulatta), Jungle cat (Felis chaus), Leopard cat (Prionailurus bengalensis), the Indian porcupine (Hystrix indica), Otter (Lutra perspicillata) and wild boar (Sus scrofa). Deer and wild boar constitute the main prey for the tiger. Some species including the Bengal tiger are endangered. The ecological diversity of the Sundarbans supports a large variety of birds. The Sundarbans supports nearly 400 species of fishes in its varied aquatic habitats. Natural

regeneration refers to renewal of a tree crop by natural means, as opposed to artificial regeneration by means of planting or sowing as done in mangrove plantation. The mangrove of the Sundarbans is dependent on natural regeneration for its existence. Salinity of the area apparently influences the regeneration density, which decreases with increasing level of salinity.

In patenting a product, for example, Muslin, a brand name of pre-colonial Bengal textile, especially of Dhaka origins, never enjoyed a genuine mention. Dhaka Muslin was in great demand in the national and international markets.

The textile industry of Bengal is very old. Bengal cotton fabrics were exported to the Roman and the Chinese empires and they are mentioned in Ptolemy's Geography and the Periplus of the Erythraean Sea, and by the ancient Chinese travellers. But Dhaka Muslin became famous and attracted foreign and transmarine buyers after the establishment of the Mughal capital at Dhaka. The Muslin industry of Dhaka received patronage from the Mughal emperors and the Mughal nobility. A huge quantity of the finest sort of Muslin was procured for the use of the Mughal emperors, provincial governors and high officers and nobles. In the great 1851 Exhibition of London, Dhaka Muslin occupied a prominent place, attracted a large number of visitors and the British Press spoke very highly of the marvelous Muslin fabrics of Dhaka.

However, the most important cause of decline and the ultimate extinction of the Muslin industry was the industrial revolution in England, which introduced modern inventions in manufacture. The costly Dhaka cotton goods, particularly the Muslin, lost in competition with the cheap industrial products of England, http://www.banglapedia.org/HT/M_0427.HTM

Nakshi Kantha is another, embroidered quilt said to be indigenous to Bangladesh. Kanthas exemplify thrift, as pieces of old cloth are put together to make something new. However, old cloth also has a magical purpose, as it is believed to ward off the evil eye. The Kantha made of old cloth is thus supposed to keep its user safe from harm. Kantha motifs, many of them common to the alpana, also have a magical purpose and reflect both the desire of the needlewoman for happiness, prosperity, marriage, and fertility as well as wish-fulfillment.

While the utilitarian Kantha never ceased to be made, political upheavals, the availability of manufactured articles and changing tastes led to a decline in richly embroidered Kanthas in the early decades of the twentieth century. In recent years the interest in ethnic arts and crafts has encouraged a Kantha revival in both Bangladesh and West Bengal, http://banglapedia.org/HT/N_0026.HTM.

Jamdani is an ancient fine muslin cloth with geometric or floral designs. Jamdani therefore could mean diapered cloth. It is probable that Muslims introduced Jamdani weaving and the industry was their monopoly for long. Expensive Jamdani had a world market too. Asian and European royalties regularly put up orders for Dhakai Jamdani through various companies. The production of expensive Jamdani suffered set back in the early 19th century when cheaper machine-made Jamdani began to capture the world market for Jamdani. However, the long tradition of Jamdani craftsmanship is still alive, http://banglapedia.org/ht/J_0049.HTM.

Issues related to Traditional Knowledge, Genetic Resources and patenting of life

The primary causes of failure stem from a lack of understanding of the essential differences of TK, genetic resources and patenting of life, at all levels, in foreign environments. Here, without proper understanding, finding and nurturing, and implementing an international or global strategy may not be a smart proposition. One size never fits all, so is with IP. OSAD's positioning on this remains grounded on the fact that professionals are familiar with the concerns and aspects of operating across countries and cultures. When it comes to operating in a global context, most organizations and most professionals are at an early stage of learning, 'What IP does stand for?'.

For example, traditional farming systems offer considerable promise as models and starting points for sustainable agricultural and rural development. According to Reijntjes, et al., most traditional farming systems have the following features in common:

(a) *Holistic world view:* farmers see themselves as part of a larger whole, as farming is not merely production but a way of life.
(b) *Risk minimization:* greater importance is attached to reducing or spreading risk than to maximizing production.
(c) *Community/family based farming:* the community plays a crucial role by upholding local culture and knowledge; organizing community labor, designing and controlling land use, and managing change.
(d) *Soil protection and recycling nutrients:* various methods of soil and water recycling are practiced with emphasis given to fallowing and recycling farm waste. Depending on genetic and physical diversity: a wide variety of genetic resources (crop livestock, trees) is used, primarily in ways that suit the local condition.
(e) *Optimum use of local resources:* traditional farming communities manage with a minimum of external inputs.
(f) *Location specific methods:* each farming community develops different techniques to suit specific conditions.

The struggle to provide sufficient food to the family for survival requires the integration of numerous sophisticated farming skills:

(a) Farmers develop and adapt complex farming systems.
(b) Farmers save and improve their genetic material.
(c) Farmers develop their own pest control measures.
(d) Farmers develop their own methods for harvesting and storing food.
(e) Farmers develop their own methods for marketing of products.

Future prospects

Food security is of prime importance to all countries, but it is imperative for developing countries, where productivity is low and balanced food has to be provided to teeming millions without much opportunity to increase area for production. This entails that developing countries increase productivity by adopting advanced scientific techniques, including biotechnological approaches.

Biotechnology can help cross the yield plateau, which now appears to have been reached for major crops largely produced and consumed by the poor. Simpler biotechnologies, such as micro-propagation are within easy reach of the poorest of Third World Countries. These technologies need to be more closely targeted to respond to the

needs of the poor e.g. focusing on subsistence food crops, reduction in the use of purchased inputs, higher cropping intensity and reduction of risks.

To take the benefits of new technologies to the economically and socially disadvantaged sections of the rural population, the concept of biovillage, a term used to denote the integration of recent advances in biological technology with the best in traditional technologies to enhance the livelihood security of rural population has been proposed.

The case studies took place in the Vinh Phu Province, Tam Quan Village and Thong Hamlet of HaBac Province. Technologies identified emphasized the participatory approach at the community level. Only simple and easily applied technologies were identified. Farmers showed interest in saving of endemic and local varieties, use of resistant varieties and IPM application. Mixed cultivation, crop rotation and organic agriculture were used to gradually replace the monoculture. The publication also mentions a list of databases available. This includes English and Vietnamese names of specific plant and vertebrate species in the western side of Tamdao Park, soil characteristics, IPM database and pests and diseases and natural enemies, all in the site at Tamquan.

China is one of the richest biodiversity countries. It has a vast area of territory, varied climate and complex geography. Almost all the main animals and plants inhabit here. Statistics show that, at present, there are 300,000 plant species in China, accounting for over 10% of higher plants in the world, which include specific plants of about 200 genus. Mammals, birds, creepers and amphibian account for 10% of world population. Under the Asian Biotechnology and Biodiversity Sub Program of the UNDP/FAO Sponsored FARM Project, studies were taken up at the FARM site in China, for application of new biotechnologies to contribute to the agriculture resource management and sustainable protection and also for conservation of their natural resource base. The main studies taken up were: Application of the potential biotechnologies and demonstrations at FARM sites, Identification survey and assessment of existing biodiversity, collection, conservation, exchange and development of genetic germplasm resources of crops, biomonitoring of health of the environment and ecosystems using bioindicators; Use of molecular biology markers in the preservation and identification of germplasm.

Information on sustainable agriculture and resource use technologies and practices in the region is to help create greater awareness and better understanding of what is happening around us. It is also to assist us to adopt and adapt some of the ideas for use and help accelerate the movement for sustainable resource use and management as the organizing principle of development. As Frank A. Bisby observed that the massive development of biodiversity-related information systems on the Internet has created much that appears exciting but chaotic, a diversity to match biodiversity itself. This richness and the arrays of new sources are counterbalanced by the maddening difficulty in knowing what is where, or of comparing like with like. But quietly, behind the first waves of exuberance, biologists and computer scientists have started to pull together in a rising tide of coherence and organization. The fledgling field of biodiversity informatics looks set to deliver major advances that could turn the Internet into a giant global biodiversity information system.

MISAPPROPRIATIONS AND MISUSE

Now, the question is, in the context of TK, it refers to the unsuitability of existing IP regime for protecting TK and the demand in some quarters of framing a specific legal regime for its protection.

GRAIN, an international NGO promoting action against genetic erosion, one of the most pervasive threats to world food and livelihood security, has done a limited sample survey of bilateral agreements between developed and developing countries in five areas to see how TRIPS-plus standards are being pushed on developing countries with respect to biodiversity. Five types of treaties were examined: trade, investment, aid, science and technology, and IP. By far the most specific, in terms of TRIPS-plus measures that developing governments are committing to, are the bilateral trade and IP agreements. The bilateral investment treaties, by contrast, are far less explicit but potentially more damaging. This categorization was preferred to the least developed economies as when technological capability is added to standards of living, these economies share more things in common. Given the secrecy of these bilateral negotiations, the extreme commitments they embody and the sheer speed with which they are tying the hands of developing countries must be stopped. If not, they will soon leave us with a disastrous *fait accompli* in terms of the global "playing field" for patents on life.

Henk Hobbelink, GRAIN's Coordinator, pointed out. "Country after country, from Nicaragua to Bangladesh, we see them undermining national decision-making processes and hijacking policy options for the South. The implications for farmers, agricultural research and the public interest are serious. Bilateral treaties are one more tool used by industry to control access to genetic resources, the very basis of the world's food supply. Bilateral and regional treaties are direct and powerful tools for transnational companies to improve market conditions in developing countries:

- Industrialized countries are using bilateral treaties to secure ever stronger monopoly rights on biodiversity in developing countries.
- Bilateral trade, aid and investment deals take Southern governments beyond their commitments to the already controversial TRIPS.
- "TRIPS-plus" treaties are setting a new international standard for IP regime ignores current limits on patenting life.
- Grain identified some 23 cases of bilateral treaties between developed and developing countries that are plainly TRIPS-plus, these two dozen agreements already affect 150 countries in the South.
- Many people are not aware of how they bind governments to much harsher rules on IP than the WTO.
- This "back door" approach to harmonizing IP regimes needs to be rapidly and firmly closed.

WHO resolution EB117.R5 was adopted by the 117th Executive Board in January 2006, and subsequently resolution WHA59.26 by the 59th World Health Assembly in May 2006. http://searo.who.int/en/Section1430/Section1439/Section1638/Section2234/Section2272_11911.htm

The resolution addresses the need to promote a constructive dialogue between trade and health at the national level and to put the necessary mechanisms for that in place. But while intersectoral dialogue within the government may be the main focus, other parties and

partners should also be consulted. This includes the private sector, academics with relevant expertise and consumers' organizations. Academics could especially play a valuable role, since they can be encouraged to undertake research that can feed into these discussions. This would help countries to base policies on sound evidence, to identify opportunities and risks and ultimately to maximize the positive effects of trade liberalization and minimize the negative impact on health.

Bangladesh is given the fact that per capita health budget in Bangladesh is just about a meagre sum of $3 which is perhaps less than the cost of vaccination against just one disease. The six EPI vaccines currently being used throughout world were developed a long time back. Their development cost was recovered long before so that these vaccines can now be produced at a relatively low cost in many developing countries by using technologies that are readily available, many in the public domain, thus not protected as IP.

Bangladesh is a country with heavy load of infectious diseases many of which are vaccine-preventable. The WHO has taken steps for elimination of the six childhood diseases through an *Extended Program of Immunisation* (EPI). Trade in health services can contribute to domestic revenue and may help to improve the quality of health services. But it may also cause or aggravate shortages of health personnel or lead to a two-tier health care system. Developing countries' minimal participation in meetings of the Codex Alimentarius remains a cause for concern, since it could result in standards being adopted that do not take into account sufficiently their realities and interests.

At the same time, while developing countries are still in the process of implementing TRIPS and of analyzing and managing its implications on the prices of pharmaceuticals, they are increasingly being faced with demands to provide IP protection that surpasses the standards set by TRIPS. Such demands, which will further delay generic market entry, are among others made in the context of bilateral free trade negotiations. "TRIPS-plus" provisions have also appeared in recent WTO accession negotiations. These developments are worrisome, since generics play a key role in making medicines more affordable.

Without defining what is meant by a patent, Article 27(1) of TRIPS[2] recognizes that, subject to certain limited exceptions, 'patents shall be available for any inventions, whether products or processes, in all fields of technology, provided that they are new, involve an inventive step and are capable of industrial application.'

The NIEs have the institutions to meet the TRIPS obligations, and the Republic of Korea and Israel are strategically positioned to move to the technology frontier. However, Brazil, Mexico and Turkey lack the high tech infrastructure to make the transition. The second-tier NIEs enjoy the basic infrastructure to ensure compliance, but lack the high tech infrastructure to participate actively in the innovation process. Argentina's relatively stronger high tech infrastructure has continued to decline following chronic financial problems, while Venezuela has yet to install the requisite institutions to stimulate strong participation in innovative activities. The second-tier NIEs of Asia managed to industrialize rapidly through the participation of foreign MNCs. However, their extremely low levels of high tech endowments have made them vulnerable. MNCs account for much of their high tech exports.

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[2] General Agreement on Tariffs and Trade – Multilateral Trade Negotiations (The Uruguay Round): Agreement on Trade-Related Aspects of Intellectual Property Rights (1994) 33 ILM 81)

China is the only exception where there is a steady growth in high tech institutional support to facilitate stronger RPI figures in future.

The poor LIDEs neither have the instruments to engender capability building fast enough to trigger a catch up with the developed economies, nor the financial might to erect governance instruments to honor TRIPS obligations. The primary concerns of many of these economies are related to generating basic infrastructure and hence efforts to install IP mechanisms may undermine their capacity to achieve the former – thereby denying them the opportunity to appropriate synergies for capability building domestically.

The TRIPS agreement relating to patents – especially the standard periodization of 20 years – would be extremely hard on the developing economies. The extension of copyright to include computer programs could also negatively restrict capability building and access in developing economies. However, given the heterogeneity of IP instruments and the importance of protecting IP of the developing economies, copyright could play an important role if it is confined in the spirit of the Berne Convention. Literary and work of art, generally the product of artisans and individuals, do not overlap with public utilities and basic needs' goods. The application of these procedures should help rather than harm the evolution of literary and other works of art and culture.

Community responses - the lack of consensus regarding the definitions and interpretations

One size never fits all and credibility is based on expertise. NGOs are in this play with a little knowledge of the Rules of the Game. As if, globalization is a funny sport, and we are all players. In this part of the world, an adage goes: Little Learning is a Dangerous Thing. For most of us, globalization is forcing us to grapple with complex issues as we seek to gain or sustain a competitive advantage, too fast with a little knowledge of the state-of-the-art. OSAD strongly feels that the IP issues are to be distinctly resolved at three levels – national, regional, and international. In character, IP may take a national or regional accent, but there is no international accent as such.

Current research results showed that economies with strong innovation incidence as shown by the resident patents index, also had strong basic infrastructure and high technology index. However, the converse did not hold between basic infrastructure index and residents' patents index, suggesting that the former is a necessary but not a sufficient condition for innovation. Economies with high resident patent index also enjoyed high technology index. The LIDEs in particular are seriously disadvantaged as they lack the high tech infrastructure to participate actively in the innovation process. Most of these economies have yet to achieve even adequate basic infrastructure and hence TRIPS may hinder technological capability building.

Any practitioner wishing to research and develop innovations for the traditional community must have a clear understanding of the TK system and be able to facilitate a true two-way participatory process before beginning research on technologies.

NGO involvement in the developments

With an area of 147,570 square km and nearly 130 million people, Bangladesh is the world's most densely populated country. Once it had been the cradle of a rich culture. Both science and fine arts flourished in the region, which was also a relatively affluent part of the

subcontinent. There are many ways to encourage innovation and there are many ways for people to guard against the misuse of their creative works. But, over the course of the last century, these functions have increasingly become the domain of the courts and the various legal systems that they govern, such as copyright, patents, trademarks, plant breeders' rights, geographical indications and industrial designs. Scientists called for the removal of the trade related IP rights agreement on the grounds that "scientific curiosity and concerns to help humankind" were the prime drivers of innovation.

The research and development (R&D) activities in the agriculture sector is essentially confined to a few crops of which rice is the most important one. A total of 36 varieties developed by BRRI are in use at the level of the farmers and newer varieties are now at various advanced stages of development, including the development of hybrid rice. This success is partly due to the very nature of the work, that is, the country's staple crop is the target of research and thus potentially impact-producing, and partly because of its linkage with IRRI. The same type of compliment, however, cannot be easily offered to jute although its parent R&D organization, *Bangladesh Jute Research Institute*, has developed good varieties, its impact is minimal because the use of jute has encountered severe competition from its competitor plastic products.

BRRI has been singularly responsible for the country's enhanced level of cereal production which is currently said to be at near self-sufficiency level. Future programs are directed both to improved varieties including the presently popular 'hybrid rice' production technology along with research on management practices such as use of fertilizer, insecticide and pesticide and proper irrigation technique. The thrust would be to double the cereal production of which rice will be the most important component, but wheat will also increasingly gain in importance.

Tea has a good world market but market competition is high, as Bangladesh is in the third position after Sri Lanka and India. The *Bangladesh Tea Research Institute* (BTRI) is a fairly old institution established in 1957 and is of comparable age with BCSIR. It has been working on improved yield and quality of tea through research on breeding and tea processing. Recent accomplishments include development of cloned varieties that are in the market both for domestic consumption and export.

The *Bangladesh Agricultural Research Institute* (BARI) is mandated to conduct research on crops other than rice, jute and tea. According to a BANSDOC survey, BARI has a revenue and development budget, which is the highest among the R&D institutions in the agriculture sector. The Institute is also one of the biggest recipients of foreign credit.

A high-profile *National Committee on Science and Technology* (NCST) was created in 1983 as the sole advisory body on science and technology with the President of the country as its chairman. For three years, it drafted a policy, which was formally approved by the government in 1986. The National Science and Technology Policy is a fairly broad-based document, which includes 'improvement of standard of scientific knowledge at all levels from the school to the university'. To this effect it suggests orientation of school curriculum, measures to ensure 'qualified teachers, physical facilities, equipment, books, journals, teaching aids' together with the establishment of an Open University 'for expansion of science education'.

After formal entry of the country to free market economy, there were some changes in S&T planning. Adjustments to the free market economy and transition were not easy in Bangladesh and the process is far from complete. Some aspects of the S&T policy are being re-examined for possible revision in the context of the changed global circumstances.

In Bangladesh, the biodiversity in rice is high. According to the experts, a very limited number of studies have been carried out on crop modeling, particularly as institutional mandate or work. A crop model is a simple representation of a crop, used to study crop growth and to compute growth responses to the environment. Same is applicable to precision agriculture. Use of isotope and radiation techniques in agricultural research to increase crop production is being tried by *Institute of Food and Radiation Biology* (IFRB) and *Bangladesh Institute of Nuclear Agriculture* (BINA) with some positive results. The WIPO Standing Committee on the Law of Patents (SCP) that took place from March 23 to 27, 2009, agreed on a range of work items that will continue to clarify and focus attention on key substantive issues relating to patent law and practice.

Needs and expectations

OSAD's relations, understanding and working with the folk life set a tone for its future intervention in the realm of development of the Public Knowledge being an active player in the open access movement, thus improving the scholarly and public quality of research, training and development. The Committee reaffirmed that the non-exhaustive list of issues identified at its June 2008 meeting would remain open for further elaboration and discussion at its next session scheduled for November 9 to 13, 2009. It also decided to include two further issues in the list, namely "patents and the environment, with a particular attention to climate change and alternative sources of energy" and "patent quality management systems".

Since patent information is a public good available for everybody's use, it is considered one of the richest technological information sources worldwide. Discussion centered around on the generic non-exhaustive-issues in the order of their appearance in document SCP/12/3 included economic impact of the patent system, transfer of technology, competition policy and anti-competitive practices, dissemination of patent information (including the registration of licenses), standards and patents, alternative models for innovation, harmonization of basic notions of substantive patentability requirements (e.g. prior art, novelty, inventive step, industrial applicability, disclosure), disclosure of inventions, database on search and examination reports, opposition system, exceptions from patentable subject matter, limitations to the rights, research exemption, compulsory licenses, client-attorney privilege, patents and health (including exhaustion, the Doha Declaration and other WTO instruments, patent landscaping), relationship between the patent system and the CBD (genetic resources/TK/disclosure of origin), and relation of patents with other public policy issues.

The WIPO IP Handbook: Policy, Law and Use (WIPO Publication No.489) offers a comprehensive introduction to the policy, law and use of IP. It also provides a short profile of each of the WIPO Member States is available on the WIPO website (www.wipo.int). These profiles include basic legislation, membership of international treaties, administrative structures, governmental and non-governmental bodies for information and enforcement, educational institutions and industrial property statistics, and useful contact information. It is an informative tool for all kinds of readers, not only for officials working in this field, but also for legal practitioners, teachers, students, researchers, creators or owners of IP, as well as interested members of the general public.

In the days ahead, with the advent of TK and IK, with due cognizance, we may see a different world and the market a different one with due regards to IP and concerns for patent registration. We may see, as we experience in the tribal areas today, in the cities, neem sticks to replace toothbrush-toothpaste, raw herbal fruits (reethha) to replace shampoos, cocoa-milk to replace soap. In the market, like Gresham's Law, good products will drive bad products/injurious stuff out-of-market. The credit must go to those people of origin, who started a crafted life with informed choice.

LESSONS FOR THE IGC

As Jean-Paul Sartre mentioned, there should be a universal essence in every human actions. WIPO as a Learning Organization constantly monitors its environment for changes, and learns from and adapts to these changes. IGC sessions are to build feedback loops designed to maximize the effectiveness of their learning processes on actions and interactions.

GLOSSARY

Action – interventions that affect the lives of the people.

Biological diversity – Article 2 of the CBD defines the term as the variability among living organisms from all sources including, *inter alia*, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems.

Diversity – biodiversity is the wealth of life forms.

Domestic biodiversity – the genetic variation existing among the species, breeds, cultivars and individuals of animal, plant and microbial species that have been domesticated, often include their immediate wild relatives.

Ex-situ conservation – the conservation of components of biological diversity outside their natural habitats, often in a laboratory, collection, botanical garden, zoo or aquarium.

Gene – the basic unit of heredity transmitted from generation to generation; the part of the DNA molecule that encodes a single enzyme or structural protein unit.

Genetic material – Article 2 of the CBD defines the term as any material of plant, animal, microbial or other origin containing functional units of heredity.

Genetic resources – Article 2 of the CBD defines the term as genetic material of actual or potential value.

Indigenous knowledge – knowledge held by communities and peoples that are indigenous.

Indigenous people – people whose ancestors inhabited a place or country when persons from another culture or ethnic background arrived on the scene and dominated them through conquest, settlement, or other means and who today live more in conformity with their own

social, economic, and cultural customs and traditions than with those of the country of which they now form a part.

Intangible cultural heritage The UNESCO Convention for the Safeguarding of the Intangible Cultural Heritage (2003) defines the term as the practices, representations, expressions, as well as the knowledge and skills that communities, groups and, in some cases, individuals recognize as part of their cultural heritage.

Integration – compatible with ecological needs and social aspirations, initiation and reinforcement of activities within the framework of social, economic and technical development that respects sustainability.

Interconnectivity – Understanding the fact that one is always related with the other Gender - taking into account men's and women's different roles, responsibilities, expectations and constraints.

In-situ – in the original location, in-situ conditions means the conditions where genetic resources exist within ecosystems and natural habitats; in the case of domesticated or cultivated species, in the surroundings where they have developed their distinctive properties.

Livelihood security – as a means of alternative income and food security.

Participation – active and responsible involvement of men and women as well as local contributors.

Social interaction – dynamic, changing sequence of social actions modify their actions and reactions due to the actions by their interaction partner.

Sustainability – the wisdom of the farmers who have developed and refined the countless traditional practices.

Sustainable development – development that meets the needs of the present without compromising the ability of future generations to meet their own needs", Earth Summit.

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