Chapter 5
Protection of Traditional Knowledge in Bangladesh

1. Introduction

Bangladesh is a small sub-tropical country (143,998 sq. km.), The unpredictable climate makes agriculture risky. There is no modern or indigenous technology that can ensure food security for the average family. In the face of geographical uncertainties farmers have succeeded in evolving well-adapted crop varieties and appropriate soil fertility management strategies. They have developed low external input technologies that minimized risk given their unpredictable climatic conditions (Zaman, H, 2000:31). Bangladesh possesses a rich heritage of traditional knowledge through which people try to manage their production system on the floodplain, exploiting land, fisheries, livestock and forests, to earn their livelihood. Their floodplain production systems are unique example of agroecological systems at the land/water interface, supporting a high-density population (Barr, Ray, Sillitoe, 1996) besides knowledge of agriculture, the traditional system of medicine in Bangladesh includes Ayurvedic and Unani medicines for which a national policy exists. In Bangladesh there are 5000 plants, of which 1500 to 2000 plants are covered through different ethnobotanical and ethnomedical surveys. Conservatively a minimum of 1000 plants have medicinal value. (Khan, Choudhury, 2004:277) Consequently the traditional knowledge associated with is also large.

2. Significance of Traditional Agricultural Knowledge in Bangladesh

Bangladesh a tropical country like India is predominantly a rural country with agriculture being the mainstay of the economy. Out of the total land surface agricultural land is 65.3% and government forest land 15.19% (Ahmed, 2000) the majority of the population is either directly or indirectly connected with agriculture. In such an agrarian
society, farmers have relied on indigenous knowledge for centuries, organizing production on the basis local knowledge transmitted from previous generation where it is built upon, modified and refined to suit current circumstances. Farmers grow and retain these cultivars mainly due to (i) non-availability of improved variety and/or their seeds, (ii) low input requirements by traditional varieties, (iii) their adaptability to specific ecological niches (e.g. deep water rice, salinity tolerant varieties of crops etc.), (iv) their resistance to pests, (v) their specific quality (ies) like finer grain, aroma, specific tastes, etc. It is significant to note that traditional varieties suited subsistence farming which is still, the very feature of Bangladesh agriculture (ibid).

However, genetic erosion due to introduction of modern varieties of crops has become a serious problem in Bangladeshi agriculture. The country has been the abode of some 5000 species of higher plants (angiosperms). There were some 8500 cultivars of rice alone in the early 1960s, which has been reduced to a few dozen of rice cultivars to be found in a farmer's fields. With the introduction of modern technology, including genetically modified crops, though the productivity has increased manifold, other problems have emerged. These relate to loss of soil fertility, low organic matter content (more than 60% has below 1.5%) in the soil and low level of nitrogen in almost all soil types. The annual rate of depletion is estimated at 250kg/ha while only 100 kg/ha is returned to the soil in the form of added fertilizers.

3. Traditional Knowledge of Agriculture and Medicine of the Indigenous Tribes of Bangladesh

Even the indigenous tribes have their own traditional knowledge systems. Apart from the dominant Bengali population, in Bangladesh there are about nineteen major tribes of which fourteen live in the hill tracts districts (Chakma, 1992:4). They include the following tribal groups: Chakma, Marma, Murong, Tripura, Thanchumga, Chack, Bhome, Pangkhoa, Kheyang, Rheyang, Rhakhain, Kushai and Kuki. The lifestyle, culture and language differ between each tribe (Rahman, 1997:1-2). These tribal communities remain dependent on the natural resources available in the forests of their
hilly region for their livelihoods. They have a long historical association with the area and a rich cultural heritage distinct from the dominant Bengali population. These indigenous tribes too possess knowledge of agriculture and medicine. However, one witnesses an erosion of their knowledge as well. For example the establishment of community health services in the hill areas is resulting in people discarding traditional herbal cures.

4. Traditional Knowledge Related to Medicines

Traditional medicines hold significance in this country where fewer than 30% of the population consults allopathic doctors. Traditionally the diagnosis and treatment of disease has been handled as part of the religious life of the villages. The village women know exactly which medicinal plants or herbs to use for specific ailments. The knowledge of these medicinal herbs has been handed down from centuries from one generation to another and the knowledge is in the public domain. Local healers provide most medicine for the people, and many of these products are supposedly prepared and administered according to ayurveda or unani systems. ‘Based on the vedas, or the religious texts of India, ayurveda has been practiced for thousands of years in Bangladesh. Unani system of medicine is described as the Muslim system based on that of the ancient Greeks’. (Francis:54) Even other traditional occupations have not abandoned their indigenous knowledge, such as carpenters, potters, blacksmiths and fishermen. These groups also continue to draw on their local knowledge heritage, intrinsic to daily life, when producing their goods and products. Due to its poor economy, the nation has inadequate health facilities. In rural locations, few people have access to medical services because of their economic poverty combined with a shortage of trained medicinal practitioners in villages. Only one graduate medical practitioner is available for every 4,955 persons in the country (Bangladesh Bureau of Statistics, 1995) Modern treatment is therefore not of great importance to rural people. For centuries village women have been doctoring common ailments with locally available herbs and shrubs found around their homesteads, or in fields and jungles. The village poor in Bangladesh rely on a traditional medicinal system, known as the kaviraji system, for primary healthcare. However, this traditional medicine related knowledge system is
facing threat. In the past, the plants needed were collected from local forests and fallow lands, but with extensive deforestation and over-utilization, wild populations of these plant species are disappearing fast. Moreover, with the domination of the modern allopathic medical system and the continued neglect of the herbal system, traditional practitioners are vanishing. Thus the indigenous knowledge associated with this system is eroding fast (Zuberi, 2000:108)

5. Rationale for Protection of Traditional Knowledge of Bangladesh

Introduction of chemical fertilizers instead of natural manures, modern varieties of crops often introduced by MNCs have sought to bring about a change in the agricultural patterns of farmers leading to loss of traditional varieties. Introduction of hybrids to improve yields and the consequent effects have raised questions on the feasibility of such efforts on the one hand and the need to protect traditional knowledge associated with rice cultivation as a more sustainable option.

Rice accounts for a major source of food, income and employment in Bangladesh. It covers 77% of the total cropped area (Hassan, Ahamad, 2005:1). But while its production remained stagnant to 12 million tonnes in the 1950s, population increased by 2.5% in the same period leading to concerns about food security. From the 60s therefore, a growth in the production, due to increased cropping intensity, changes from direct seeding to transplanting method, and introduction of modern agricultural inputs such as chemical fertilizers and irrigation by power pumps, promoted by government programmes, was witnessed. With the adoption of hybrid varieties, new changes were witnessed. Agricultural sector went through substantial changes in the 1980s to reduce the yield gap. In the 1980s, the governments control over the market was reduced markedly to promote open market. A number of MNCs exploited this opportunity and entered the market with their hybrid seeds. Large scale use of hybrids began in 1996. Since then 68% of the rice yield comes from hybrid seeds (ibid:2)
An assessment of the farmers' experiences with these hybrid rice adoption during the 1989-99 indicates that hybrid seeds though have a higher yield also have some shortcomings such as high cost of seed, requirement of more crop care and management time, less yield gains, high pest and disease attack, low profits and lack of suitability for home consumption. (Hasan, Ahamad(2), 2005:4) Moreover, farmers and consumers have complained that hybrid rice does not taste well. Most of the farmers prefer to eat rice of local varieties and sell the hybrid rice.

According to experts, the hybrid technology is quite sophisticated and often the companies cannot ensure the quality, which may fluctuate even at the smallest variations. The common apprehensions regarding the cultivation of hybrid seeds have not been addressed by the law either. Thus the changes in cropping patterns during the last 20 years have led to, among other changes, introduction of new crops and HYVs, introduction and adoption of concentrated fertilizers and the adverse implications of these changes have been on the soil fertility and effects on pests/diseases.

The focus has shifted back on the traditional varieties since they are suitable to the soil and climate conditions.

Once Bangladesh had more than six thousand varieties of local rice, but due to High Yield Varieties monoculture the local varieties have disappeared at an alarming rate and only 100 are presently estimated to remain. It is assumed that the same applies to fisheries and forest resources. The local knowledge base is eroding faster than that of natural resources. The exploration and documentation of people's knowledge regarding natural resources and their management, has been delayed for long.

Traditional systems of medicines though still popular are facing threat due to loss of forest cover from which the herbs are often procured or abandonment of traditional occupation of practitioners. The relatively recent introduction of western medicine into rural Bangladesh, has resulted in a general shift in people's perception of health care. It would appear that the younger generations increasingly have more faith in the modern
doctor than they do in traditional herbal practitioners (i.e. *kaviraj*, *piranee*, family and village elders) whom they often regard as outdated and immersed in superstition.

However, a number of major allopathic companies have entered or are entering the herbal medicine sector including Square, ACME, Jayson and Mystic. These Corporations have been responsible for promoting the liberalizing Drug Act and are particularly keen to apply science, modern marketing techniques and to open the avenues of marketing herbal products through MBBS doctors(Dixie, Ali, Hussain, 2003:16) The rate of expansion in the herbal market should accelerate and in particular the larger and better organized companies should benefit.(ibid) These developments imply the role of MNCs in traditional medicine and the need to protect any effort to exploit national resources without sharing of benefits.

For these reasons Bangladesh has been laying emphasis on the protection of traditional knowledge since it relates not only to the vast majority of farmers who are dependent on the knowledge for their survival but also because indigenous knowledge is a resource that has economic value for Bangladeshi society.

The National Environment Action Plan (1995) includes in its recommendations that actions on land resources must integrate indigenous practices, to increase efficiency of production, systems and its application(ibid) The New Agricultural Extension Policy (1995) of Bangladesh also states that "it is recognized that farmers' own indigenous knowledge, is often environmentally sustainable, and efforts should be made to support and learn from farmers, as well as the formal research system"(New Agricultural Extension Policy, 1996) It also says that farmers are engaged in their own experimentation, as part of their daily agricultural lives. National Biodiversity and Strategy Action Plan (2005) is an important step towards the recognition of traditional knowledge systems of Bangladesh and the need to protect it.
6. Studies Conducted on the Significance of Traditional Knowledge in Bangladesh

Realizing the significance of traditional knowledge, studies conducted in Bangladesh have so far involved documentation of knowledge systems in crops, forestry, fisheries and livestock. For example, Haque made a qualitative assessment of the loss caused by the hydroelectricity project in Kaptai, resettlement in Chittagong Hill tracts, forest development projects, water logging in Beel Dakatia, Narayanganj-Narsingdi Irrigation Project and shrimp cultivation in Chakaria and Sunderbans. (Haque, 2000: 150-151) Similarly Mohammad Danesh Miah and Mohammad Shaheed Hussain Chaudhury of The Institute of Forestry and Environmental Sciences, University of Chittagong have conducted an exploratory study on the ethno-botanical perception of the Mro tribe of Bandarban, Bangladesh to focus on the implications of healthcare using medicinal plants collected from forests. The Mro were found to be completely dependent on the forest for their medicare. The dimension of dependency reflected their ethno-botanical knowledge. A total of 39 medicinal plant species (9 herbs, 12 shrubs, 6 creepers and 13 trees) were recorded as collected from forests (Miah, Chaudhury, 2003: 62) Many of the plants used by the Mro tribes have led researchers to conclude that chemical analysis of the respective plant parts may provide clues to research the properties of those plants in the treatment of some non-curable diseases like AIDS, cancer, diabetes etc. (ibid: 69) The indigenous knowledge developed in using medicinal plants can be used as tool for the conservation of forests resources by coinciding with the perception of the CBD. If the Mro are given the IPRs over medicinal resources, according to the agreement on TRIPS, so that they have the freedom to use them as tradable commodities, their socio-economic status will then be developed on the one hand and biodiversity of the hill forests will be conserved on the other through sustainable production and management of the medicinal plant resources (ibid: 69) Apart from these there are several others who recorded traditional knowledge, but so far there has been no attempt to find out the quantitative value of traditional knowledge.
7. Role of Customary Law in Protecting Traditional Knowledge and Regulating its Transfer

So far there is no system in operation in Bangladesh for protection of intellectual property rights of plants and animal genetic resources. However, in case of industrial microbiology, patenting are made. There is a council for industrial research (Bangladesh Council for Scientific and Industrial Research) which generates industrial technologies. (Ahmed, 2000:5) The organization patents microbes as a part of the total process. Citric acid fermentation, baker yeast from molasses (Feroza, 2000) are a few industrial microbial technologies patented by the organisation under customary law of patenting.

8. Protection of Traditional Medicinal System of Bangladesh

Bangladesh has tried to develop, protect, promote and control the practice of Unani and Ayurvedic Medicine' (Khan, Choudhury: 2004:277) The Unani and Ayurvedic Practitioners Board was formed under the Unani and Ayurvedic Practitioners Act 1983. The Drug Control Act (1982) has taken different steps for the development of Alternative medicine. A Unani and Ayurvedic Degree College has been established in 1990 (Ministry of Health and Family Welfare, 2006:2) Under the Authority vested in it by the Bangladesh Unani and Ayurvedic Ordinance (Act) 1983, the Bangladesh Unani and Ayurvedic Board has compiled two formularies, viz, National Formulary for Unani Medicine and National Formulary for Ayurvedic Medicines. These two medical systems have formularies for commercial production. Approximately 50% of these formulae are manufactured in the traditional medicine factory. These traditional preparations are by the Drug Administration Directorate. Registered practitioners can, by virtue of their registration, manufacture on a small scale the medicines they need for their own patients. The Bangladeshi herbal market is valued at Taka 3,300 million(approx $60 million) at trade prices and has been growing at rates considerably higher than the 10% growth recorded in the Allopathic market. (Dixie, Ali, Hussain, 2003:5) The consumer for herbal medicines
is, at the moment found in the rural areas. Moreover, the herbal industry considers that the urban consumers prefers the allopathic treatments which are quick and focus on symptoms rather than the long term and holistic herbal approach (ibid:116). To counter this trend and thus lose the value of traditional knowledge related to medicine that has helped it to be preserved, it is therefore important to establish traditional medicinal system on a wider scale.

9. Conservation of Genetic Resources by Agricultural Research Institutes

There are various agricultural Research Institutes (ARIs) which are involved in genetic material collection and conservation. There are three gene banks with limited facilities in three Agricultural Research Institutes (ARIs) namely, Bangladesh Agricultural Research Institute (BARI) that conserves genetic materials of crops other than rice and jute, Bangladesh Rice Research Institute (BRRI) conserves rice genetic materials and Bangladesh Jute Research Institute (BJRI) conserves genetic materials of fibre. The list of genetic resources conserved in those gene banks are documented in the Plant Genetic Resources of Bangladesh (Khan, Ahmed, 2000) Other ARIs are also involved in in-situ conservation.

10. Role of NGOs in Protection and Conservation of Traditional Knowledge

Among NGOs, UBINIG, Bangladesh Seed Foundation are noteworthy in genetic conservation and documentation. UBINIG is the abbreviation of its Bengali name Unnayan Bikalper Nitinirdharoni Gobeshona. In English it means Policy Research for Development Alternatives. The organization has been collecting information about traditional knowledge related to farming, crop rotation, green manure, compost fertilizer, pest control and such other areas. Since women play an important role in the traditional farming societies like Bangladesh, UBINIG encourages women to come forward and share their knowledge on horticulture, seed preservation, food processing.
Women are also excellent sources of information on medicinal plants. UBING seeks their help in collecting different medicinal plants and gathering information on their uses. The NAYAKRISHI ANDOLON by UBING is an attempt to bring about changes at the grassroots level through ecological agriculture by reviving the use of traditional knowledge that the farmers have of late been foregoing.

Bangladesh Seed Foundation (BSF) performs almost similar types of activities. The participants conserve the seed almost voluntarily as a group member of the organization. Bangladesh Resource Center for Indigenous Knowledge (BARCIK) is involved in documentation of traditional knowledge.

11. *Sui Generis* Protection of Traditional Knowledge and Mechanisms for ABS and PIC in Bangladesh.

In countries like Bangladesh, innovation and conservation strategies have focused exclusively on the public sector, and not on communities. Bangladesh has also witnessed the important role played by corporate research firms. Companies' interests lie primarily on varieties or new crops that have a quick pay off. This in the short term may appear attractive but can lead to extinction of farmers' varieties or germplasm having potentially useful genes but not preferable commercially (Hussain, 1999:92)

The above mentioned factors have led to the development of preparation of legislative framework for protection of traditional knowledge in Bangladesh. Awareness about the TRIPS Agreement in Bangladesh, particularly among communities who are directly affected; that is, the farming communities, is practically absent. The awareness is also very little among the rest of the people. ‘However, professionals in Bangladesh became aware of the intricacies of the issue during the months of 1995 when they were preparing the country report for FAO's Technical Conference on Plant genetic resources (PGR) that was held in Leipzig, Germany, 1996. Realising the need to protect biodiversity and traditional communities, a Biodiversity Policy Meeting at the Bangladesh Agricultural Research Council in April 1995 was organized. It led to the formation of an Adhoc Committee which proposed to the Ministry of Agriculture,
Bangladesh to formalize a broad based National Committee on Plant Genetic Resources. (NCPGR). The NCPGR with the assistance of International Plant Genetic Resources Institute organized a National Workshop on Plant Genetic Resources in August 1997. The workshop Recommendations (Hussain, Arora, Mathur, 1997:1-2) included, the development of 'the national policy framework/legislation in pursuance of the principles of the Convention of the Biological Diversity'.

11.1 The Draft Biodiversity and Community Knowledge Protection Act of Bangladesh 1998

The National Committee on Plant Genetic Resources (NCPGR) has proposed the Draft Biodiversity and Community Knowledge Protection Act. It has while acknowledging the inevitability of implementation of TRIPS provisions also brought out the need to protect traditional knowledge in the form of community. The preamble recognizes the need to 'maintain knowledge, innovations and practices of indigenous and local communities embodying traditional lifestyles' as laid down by the article 8 of the CBD. (Draft Biodiversity Act 1998)

The Act seeks to protect the rights of communities “that have the knowledge of biodiversity, and have managed, maintained, conserved, reproduced and enhanced biodiversity, genetic resources and traditional knowledge, culture and various forms of practices related to these resources.” (Article 2(1)(a) Draft Biodiversity Act)

Innovation is not merely that which is related to industrial applicability. It includes “any alteration, modification, improvement of collective and cumulative knowledge or technology, ......... and shall also include derivatives which utilize the knowledge of communities in the commercialization of any products as well as to a more sophisticated process of extracting, isolating or synthesizing the active chemicals in the composition of biological extracts used by the communities” (Article 4, Draft Biodiversity Act 1998)
The State ensures that the traditional knowledge and innovations arising from these shall not be sold, “assigned, transferred or dealt in any manner without explicit PIC and effective participation of the communities concerned. The communities will always have the right to refuse transaction based on gainful intent or any commercial utilization, exploitation and exchange.” (Article 7(4) Draft Biodiversity Act, 1998)

Besides, it has been ensured that “at least a defined percentage of benefits not less than 50% of the net monetary gain, obtained from a direct or indirect commercial use of biological and genetic recourses in which the Communities are common owners” or sole custodians have to be paid to the concerned communities. (Article 7(5), Draft Biodiversity Act, 1998)

Benefit sharing with the traditional knowledge holders have therefore been provided for and even the State “shall not have the power to negotiate access to biological and genetic resources by foreign/commercial interests without the full participation of other co-owners”. (Article 8(2)(a))

A National Biodiversity Authority (NBA) has also been envisaged under the Act with representation of the indigenous and local communities. The NBA would establish a database of biodiversity in Bangladesh called the National Biodiversity Information System (NBIS). This would also serve to protect traditional knowledge in case of misappropriation or biopiracy. Besides the NBIS, Community Biodiversity registers have been envisaged and would involve “Local Government Bodies as well as communities, particularly indigenous and local communities “and a copy of Community Biodiversity Registers will be kept at the Union and Thana level related to the locality.” (Article 12(1)(a)(iv), Draft Biodiversity Act 1998)

The Draft Biodiversity and Community Knowledge Protection Act has thus provided elaborate provisions for protection of biodiversity related traditional knowledge. However, though ABS mechanisms have been chalked out the Act is silent on the issue of disclosure of source of origin.
11.2 The Draft Plant Varieties Act, 1998 of Bangladesh

TRIPS obliges member countries to “provide for the protection of plant varieties either by patents or by an effective *sui generis* system or by any combination thereof.[article 27.3(b)]. Bangladesh is one of the many countries that have either enacted or are in the process of enacting legislation to provide protection to plant varieties. Farmers’ rights in Bangladesh have three broad aspects with relation to plant variety protection regimes. Firstly it tries to ensure that Plant Breeders’ Rights should not curtail traditional rights of farmers to save, exchange and sell seeds of all varieties that they grow. Secondly, varieties bred by farmers that is landraces or farmers’ varieties should also be protected like the way varieties developed by formal breeders have been protected. Thirdly farmers should be rewarded for their contribution in conservation and development of plant genetic resources, which are used by plant breeders in developing new crop varieties.

Though the Draft Plant Varieties Act of Bangladesh proposed by the National Committee on Plant Genetic Resources in 1998 does not specify its objective in the form of a Preamble, it makes it clear that it “shall ensure that innovations or inventions such as new plant variety is recognized only through and by the Community and not as a claim of privileges and/or rights by any subject outside the social process of knowledge production.”(Article 3 (8), Draft Plant Varieties Act of Bangladesh, 1998) Thus the tradition of invention, that is a part of the social process of traditional knowledge holders that is the farmers, has been recognized.

‘Protection’ under the draft Plant Varieties Act, 1998 of Bangladesh means defined and specific commercial privileges, whether explicitly mentioned or not, approved and granted to an innovator by the NBA. Such a protection shall not constitute any generalized IPR and may vary from applicant to applicant on the basis of the nature of innovation. Unlike this draft, the draft Bio-diversity and Community Knowledge Protection Act, 1998 does not define ‘protection’
The Act defines a farmer as “an individual who practices farming, whether subsistence or commercial, excluding a juristic person” (Article 4) and the criteria for granting protection to plant variety is that it should be “new”, “stable”, “consistent” and “distinctive” (Article 6(1) Draft Plant Varieties Act of Bangladesh, 1998).

Breeders’ rights over new plant variety extends to cases of “commercial transaction” or possession with the purpose of cultivating the “materials to propagate plants” of the protected variety (Article 20(6), Draft Plant Varieties Act of Bangladesh, 1998). The breeders’ rights over new plant varieties also includes selling or distributing, offering for sale, importing or exporting, though with the prior permission from the National Biodiversity Authority. The access to markets and all forms of commercialization of the protected variety of plants is thus in the hands of the breeders.

Various grounds for revocation or nullification of the new Plant variety certificate have been provided by the Act, which from the point of view of protection of traditional knowledge the following are useful. The National Biodiversity Authority seeks to reject applications which “fail to provide the origin of biological and genetic resources and related intellectual and cultural practices used in the innovation” (Article 10(2) Draft Plant Varieties Act of Bangladesh, 1998).

The NBA will also consider those applications as incomplete if “the financial terms of the benefit sharing contract of the applicants with community/ies from the commercial and technological gains of the new Plant Variety, applied for protection is insufficient” (Article 11(1)(a) Draft Plant Varieties Act of Bangladesh, 1998). The draft Plant Varieties Act of Bangladesh goes further than others in that the National Biodiversity Authority allows Plant Breeders’ Rights to be withheld if “potential dangers of monoculture” have been proved (Article 20(20)(d) Draft Plant Varieties Act of Bangladesh, 1998) and also if it is proved that monopolies in trade arising from “specific marketing features of the variety that are available from the free exchange of plants” (Article 20(20)(c) Draft Plant Varieties Act of Bangladesh, 1998). The draft
legislation thus seeks to provide adequate protection to farmers with regard to their free exchange of seeds.

The farmer's right in the Act includes the right to "submit a petition in court to order the prohibition of monocultures or of any act that leads to the destruction or reduction of local indigenous variety or wild plant variety narrowing the genetic base of Bangladesh Agriculture" (Article 22(1)(i) Draft Plant Varieties Act of Bangladesh, 1998). Besides farmers may also proceed for court orders "withstanding the banning of any pesticides, herbicides, or any chemicals or any genetically modified seed or propagation materials detrimental to ecology, environment, health, and safe food production of the community." (Article 22(1)(1) Draft Plant Varieties Act of Bangladesh, 1998). These provisions would on one hand prevent any environmental threat that would be posed to biodiversity and on the other; prevention of use of genetically modified seed would help in conservation of use of traditional varieties that is land races.

Though the Draft Plant Varieties Act of Bangladesh seeks to protect farmers and their varieties of crops, it has failed to include certain provisions that would have been beneficial. No express provision for PIC has been provided. However, this has been remedied in the form of the Draft Biodiversity and Community Knowledge Protection Act, 1998 which provides for prior informed consent. The Act also provides no definition of breeders. Given the aim to protect farmers a broader definition of breeders and farmers would have been desirable. The Act does not provide a preamble, purpose or objective. As protection of farmers' interest is paramount to Bangladesh, it is important to state it as one of the objectives of the Act.

After the framing of the Plant varieties Act in 1998, three subsequent drafts on protection of plant varieties and farmers rights have been framed in 2002, 2003 and 2006.
11.3 Draft Plant Variety and Farmers Rights Protection Act, 2002

In contrast to the earlier version of the draft Plant Varieties Act 1998, this draft seeks to fulfill the obligations of Bangladesh under TRIPS that requires countries to give protection to their plant varieties and thus the knowledge of farmers associated with it either by patents or *sui generis* systems or a combination of both. However, though the new draft has addressed issues related to TRIPS it has left issues such as ABS and PIC unaddressed (Kabir, 2005: 17) as compared to the earlier draft Bio Diversity Act 1998, which had mentioned such issues. Although the applicant for a new plant variety protection must show that he or she has permission of the community in using their variety or knowledge and append an appropriate arrangement for benefit sharing (Article 13.4 and 13.5)(ibid), the mechanism and details are not prescribed as in the draft Biodiversity Act, 1998. Also unlike the Biodiversity Act 1998, Article 14.7 of the new Act provides that the rejection or filing of additional applications in another country for a plant variety will not be any ground to reject an application for the same product in Bangladesh. The draft proposes the formation of a statutory authority to be called Plant Variety Protection Authority (PVPA to grant either a new variety certificates or citations of awards (Article 4) . The PVPA shall be the implementing authority of the draft and not the National biodiversity Authority as proposed under the earlier draft. It shall consist of 11 members (Articles 5 and 6) with apparently no representation from the civil society or farmers.

It has added the term ‘Protection’ but has not defined it. A statement in the preamble and objectives of the Act shows that the draft aims at ‘providing incentives to breeders, individually or in groups or in collaboration with farmers, for better and stepped up breeding of new crop varieties’. The text in Article 22 (2) rather suggests the opposite. According to the said section, the National Plant Variety Development Fund (NPVDF) to be established shall be utilized ‘ to provide a range of incentives , measures for farmers and local community to participate in various forms of activities related to the development of new plant varieties in collaboration with private and public fund
breeders ...' Since farmers and breeders have two distinct definitions, the incentive to one shall not necessarily mean and include the other. The definitions of farmers recognize the role of farmers in the development of varieties (Article 2.e) but the definition of breeders has excluded the informal communities and has apparently referred to the formal sector by mentioning the breeder as 'employer' (Article 2.a, Kabir, 2005:18)

However, in dealing with the eligibility criteria for application, the new draft adds one more condition in stating that the applicant shall be eligible if he or she is the national of a country that is party to an international convention or agreement on the protection of plant varieties to which Bangladesh is a party (Article 9.1c). Besides, the new draft is more stringent in declaring applicants having headquarters in a country that has not ratified the CBD as not eligible (Article 9.2b). The earlier draft in article 9.2b only demanded signing of the CBD and not ratification.

The Act of 2002 has talked of protection of farmers and thus ensures that traditional knowledge systems in agriculture get adequate protection. In article 25 the PVPA provides:

- The right to protect their traditional knowledge relevant to plant genetic resources from being accessed in formal sector without compensation.
- Right to claim significant contribution to a registered variety, and to receive compensation if the claim is upheld.
- Right to claim an equitable share of benefits if their varieties have contributed to the registered variety.
- Right to save, use, exchange and sell farm-saved seed/ propagating material of registered variety for non-commercial purposes.
- Violation of this Act (draft) shall be liable to either imprisonment/ fine or both (Article 23). This provision is an addition to the earlier draft.

21 This requirement has not been mentioned in the latest draft of 2003.
11.4 Main Features of the Draft Plant Varieties and Farmers’ Rights Protection Act, 2003

While the rights of breeders remain the same, the Act defines farmers’ Rights in section 19. It provides for

- The rights of farmers and their communities to protect their traditional knowledge relevant to plant genetic resources for food and agriculture.
- The right to equitably participate in the sharing of benefits arising from the utilization of plant genetic resources.
- The right to participate in making decisions on matters related to the conservation and sustainable use of plant genetic resources.
- The rights of farmers to seek cancellation and/or retribution, as the case may be, for the appropriation by the formal sector breeders of denominations traditionally in use for their varieties.
- The right that farmers have to grow, save, use and exchange, sell farm saved seed of any variety except selling of seed of a protected variety for the purpose of reproduction under commercial marketing arrangements.
- The right to have access to all information relevant for the exercise of their rights with respect to plant varieties.

This draft also changes the name of the institution responsible for its implementation from PVPA to Plant Variety and Farmers Rights Protection Authority (Kabir, 2005:19)

11.5 The Draft Plant Variety and Farmer’s Rights Protection Act, 2006

The draft Act of 2006, which has been framed by the Plant Variety Protection Act of the Ministry of Agriculture, is a revision of the earlier 2003 draft. The reason for this Act has been stated as both the obligation to comply with the TRIPS provisions and the objectives of CBD and ITPGRFA with regard to ‘protection of farmers rights with regard to plant varieties and associated local knowledge’.
Though it defines a breeder as one who 'bred, or developed a plant variety in Bangladesh which was new at that time' (Section 2(c), Draft Plant Variety and Farmer’s Rights Protection Act, 2006). The role of the farmer breeder who has ‘evolved’ a plant variety has not been acknowledged. The farmer has been adequately defined as one who ‘conserves and preserves, or adds value to, separately or jointly with any person, any wild species or community variety, through selection and identification of their useful properties’ (Section 2(h)(3)).

It provides farmers right to protect traditional knowledge related to PGRs, right to benefit sharing and also right to seek cancellation and/ or retribution, as the case may be, for appropriation by formal sector breeders of denominations traditionally in use for their varieties (Section 19).

The Act subscribes to the UPOV criteria for registration of breeders right- that is, among others, the variety should be ‘New’, ‘Distinct’, ‘Uniform’ and ‘Stable’ (Section 8). Though the Act envisages a Plant Variety and Farmers’ Rights Protection Authority (Section 3) and also Gene Fund (Section 21) the functions of these institutions do not specify any issues related to protection of traditional varieties, benefit sharing or even compensation in case of use of farmers varieties.

The new draft is more of an effort to accommodate breeder’s rights and not the traditional farmers.

12. Draft Medicinal Plant Protection Act 2005

A draft Medicinal Plant Protection Act, 2005 has also been framed under the Ministry of Agriculture (Draft Medicinal Plant Protection Act, 2005,) to establish a Medicinal Plant Protection Authority. It shall among other duties, ‘protect the loss of genetic diversity of indigenous medicinal plant resources’ (Draft Medicinal Plant Protection Act, 2005:4) and ‘regulate the export of medicinal plants to meet the importing countries requirements in accordance with international agreements, and to discharge such obligations under those international agreements regarding TRIPS and CBD.’(ibid) And keeping the
interests of the holders of traditional knowledge, it seeks to 'regulate the collection and
harvesting practices of medicinal plants within the protected areas from the wild in
respect to the ethical, legal and social interests of all those concerned' (ibid:5) It
specifies the need to 'identify the geographical indications of medicinal plant resources
to specify the true place of origin', and also to 'ensure the legal protection of medicinal
plant resources' (ibid:5) The Medicinal Plant Protection Authority may require that 'the
persons involved in propagating storing, importing and exporting, producing or
otherwise trading in medicinal plants to register with the Medicinal Plants Protection
Authority and comply with such requirements as reasonably may be required from time
to time' (ibid:8)

It may be assumed that the Act has been drafted keeping in mind the value of traditional
knowledge of medicinal plants and the need to protect them from unauthorized use. But
the Act does not provide any protection to the holders of the knowledge of these plants,
who are usually the indigenous and local communities. Aspects like benefit sharing have
not been dealt with. Though the Act seeks to protect these plants in accordance with the
provisions of TRIPS and CBD, no framework, or guidelines of such an effort are
provided. Issues such as disclosure of origin of the plant genetic resource used in
production of a medicine have not been dealt with. The Act is silent on regulating the
access to foreigners in the use of these plants, and has not mentioned conditions which
would regulate the manufacture of medicines through the use of these plants by
Bangladeshi nationals or foreigners. In the absence of such measures, the Act would
fail to address the issues of benefit sharing and prior informed consent, for Bangladeshis
or foreigners. The Act seems to imply that a person propagating the use of such plants
only has to register with the Medicinal Plant Protection Authority and not seek approval.

13. The National Biodiversity and Strategic Action Plan (NBSAP), 2005

The National Biodiversity and Strategic Action Plan (NBSAP) for Bangladesh framed
in 2005 under the Ministry of Environment and Forests is an important step towards
recognizing the significance of biodiversity and its related aspects in Bangladesh. One of the stated objectives of the NBSAP is ‘establishing mechanisms to ensure equitable sharing of benefits derived’ from the ‘sustainable use of biodiversity.’ (National Biodiversity and Strategy Action Plan, 2005:iii) It gives significance to traditional knowledge and thus seeks to ‘promote use of traditional knowledge for conservation, use and protection of the local communities’ IPRs’. In order to ‘ensure that such knowledge is not lost and when used such knowledge is recognized and rewarded’, the following actions have been suggested:

**Short term (0-3 years)**
- Document and register traditional knowledge developed over centuries by the people.
- Access the extent to which the *sui generis* system is able to protect the IPR of local communities

**Mid Term (4-7 years)**
- Provide incentives to communities to conserve indigenous food and other economic plants

**Long Term (8-10 years)**
- Promote forestry activities with a focus on sustainable harvesting and management of fuel wood and Non-Timber Forest Products (NTFPs) by supporting activities such as Joint Forest Management and development of Community Wood lots etc (creating equitable access among gender, class and caste)
- Promote the adoption of Peoples’ Biodiversity Registers throughout the country.
- Integrate traditional knowledge in local level planning. (National Biodiversity and Strategy Action Plan, 2005:49)

In the planning process of the NBSAP a key strategy is to ‘recognize the value and importance of biodiversity for the Bangladesh people and document properly its components, distribution and value.’

In pursuing the stated objectives of CBD related to conservation of biodiversity and sustainable use of the components of biodiversity, ‘lack of documentation as regards the associated traditional knowledge still available at the community level have been
identified as important issues during the NBSAP planning process’ and therefore one of the actions planned between the time period of 4-7 years is:

• Understand the economic value of biodiversity and empower local communities to achieve economic gains by developing suitable market linkages and strategies.

• Conduct village based inventory of flora and fauna, including their traditional uses. (National Biodiversity and Strategy Action Plan, 2005:44)

With regard to ABS mechanisms the NBSAP strategy seeks to ‘promote equitable sharing of biodiversity conservation costs and benefits among different sectors of the society’. It states that ‘several regional and international processes ranging from the TRIPS and IPR issues of WTO to the issues of traditional knowledge impact the national processes of ABS. Therefore, it is important to address the linkages between Access and Benefit Sharing, Intellectual Property Rights and trade regimes.’ With these objectives the NBSAP seeks to:

• Develop and implement national ABS regime on genetic resources.

• Identify impact of trade and IPR regimes on national policies regarding ABS.

• Develop suitable national policies on patents and IPRs, which, in addition to being responsive to local needs, will also contribute to international cooperation in the use of biological resources. Encourage the documentation and protection of traditional knowledge associated with conservation and use.

• Institute rewards and incentives for the conservation of indigenous crops, genetic materials and best practices of resource use. (National Biodiversity and Strategy Action Plan, 2005:48)

However, though the plan has tried to include the interests of all sections whose interests would be affected, it has failed to make the interests of farmers, the major contributors and conservers of biodiversity and traditional knowledge related to it.

While the draft Biodiversity Act and Plant varieties Act try to make provisions for the holders of traditional knowledge, that is the farmers and indigenous communities as agricultural labourers, the NBSAP does not mention these draft laws or any other
strategy to ensure community access to biological resources. The main strategies reflect a gap between ‘threats and concerns’ and ‘practical policy statements, suggestions or recommendations’. This has happened in the case of ABS, or biopiracy. Except mentioning ‘ensure equitable sharing of benefits of biodiversity and protect against biopiracy’ the NBSAP does not provide a plan as to how this is to be achieved. As a strategy and Action plan the document should explicitly stipulate formulation of laws in this regard, besides strongly recommending a through review of the patent law, and an overhaul of the patent office, which remains under the industries ministry.(Hasan,2005:2)

Although the patent office awards patents on agricultural commodities, including seeds and agro-chemicals, there are no experts on agriculture or environment working on patents. Nor is there any collaboration with such experts when considering such cases that would require such opinions. The most recently amended seed ordinance passed in the parliament does not address the issue of seed patent either.

The Action Plan envisages an ‘apex body’ and an ‘umbrella act’ towards bringing regulations and laws to conformity with the CBD. However, the apex body has been assigned a secondary role rather than a primary one. The NBSAP’s first two priorities are to document existing ecosystems, species and genetic diversity and develop village based inventory of fauna and flora, and the traditional knowledge associated with it. The Ministry of Environment has been assigned the central role, this inventory documentation responsibility has been delegated to the cooperatives through union councils or Village Governments (Gram Sarkars) But without the apex body there would be absence of monitoring authority for these activities or for the ministry to report to.

The NBSAP does not address the mechanism to prevent biopiracy and by and large ignores community knowledge and its importance in environment conservation.
Though the NBSAP mentions issues of traditional knowledge and ABS it does not deal with issues arising out of TRIPS and also the economic significance of traditional knowledge for Bangladesh.

However, the Action Plan acknowledges that although several ministries are involved and have overlapping spheres of jurisdiction, as far as biodiversity is concerned, responsibilities, communication channels, and coordination mechanisms among these many different agencies, ministries and departments remain poorly defined and unclear. A review of the mandates and policies of these agencies shows that responsibilities for management of natural resources, and therefore for conservation and sustainable management of biodiversity, is fragmented, and there is no coordination at either national or institutional levels.'(Section2.3, National Biodiversity and Strategy Action Plan, 2005)

Other major issues identified include conflicting policies, regarding conservation and management of resources, limited institutional and individual capabilities and irregular funding of programmes leading to their non implementation.

14. Conclusion

It is mandatory for countries to adopt an effective sui generis system incase they exclude patents. As a least developed country, Bangladesh’s deadline for the implementation of TRIPS Agreement was Jan 2006 but the process of preparation of legislative framework for protection of community rights and plant genetic resources is far from completion(Hossain,2002) A number of seed companies have patented their imported seeds with the Department of Patents and Design which still remains under the Industries Ministry and which has no relation with the Agriculture Ministry. The laws are completely silent on the farmers’ right to seed and appropriate conservation of seeds. Protection of Farmers’ Rights is crucial in a country like Bangladesh where farmers are the main suppliers of seeds and innovators and donors of genetic resources. The constitution and the various laws regulate farmers’ rights. These include the

• National Agriculture Policy, 1996
• New agriculture Extension policy 1996
• Forest Policy 1994
• Water policy 1999
• Import and export policy 1995-97 and 1997-2002
• National Seed Policy 1998
• Land Policy 2001

However, none of these have guaranteed farmers' rights to participate in decision making. In the absence of a legal force the policy commitment for participation remains futile. It is therefore important that the proposed laws on Biodiversity and Community Knowledge Protection Act, and the Plant Varieties and Farmers Rights Act be adopted to ensure participation and therefore enable ABS of the commercialization of their traditional knowledge.

Even though the country has 80,000 traditional healers, and there are 30 trained traditional medicine doctors, serving in 30 district hospitals, and the source of traditional medicinal knowledge is available from the pharmacopoeia and other clinical data, an effort at legal protection for this knowledge source has not been made. Also, no specific agency is responsible for genetic resources in Bangladesh to serve as a national contact point for accessing genetic resources. Germplasm exchange is made on mutual trust and on reciprocal basis. No standard material transfer agreement is in place. (Bangladesh National Capacity Self Assessment for Global Environmental Management, 2007)

Improved coordination coupled with the domestic reform agenda could help Bangladesh minimize the harm caused by TRIPS and maximize the benefits from CBD and ITPGRFA. According to Ratnakar Adhikari, the following recommendations could apply to Bangladesh as well:

- Policy coherence between various agencies of the government should be enhanced with a view to making a contribution to the overarching developmental objectives and ensuring better coordination while negotiating at the international platform.
-The flexibilities contained in TRIPS should be utilized at the time of preparing laws relating to IPR, PVP, biodiversity or ABS and prior informed consent, with a view to protecting and promoting the interests of the farming and indigenous and local communities as well as developing and making sustainable use of genetic resources and associated traditional knowledge.

-capacity building and involvement of wider range of stake holders should be a *cine qua non* in the policy and law making process.

-since documentation and registration of genetic resources could be a useful instrument not only for understanding their economic value and making their best use to achieve the overall development objectives, but also to protect them from piracy, these processes should be completed without further delay.

-contribution to public sector research in conservation and sustainable utilisation, of genetic resources should be increased. Governments should provide fiscal incentives to facilitate the process of public private partnership in research and development.'(Adhikari,2006:283)

According to Quddus, ‘further research is needed on indigenous knowledge and useful technology, to further improve on farmers’ traditional practices. Ideally such research and development activities should be planned and conducted with the active participation of farmers so that they can evaluate the alternatives for themselves and adopt the best one(s). In fact, farmers have their own research methods, which we should strive to promote. Research and development organizations should be a catalyst for the technological development process by supplying additional information to increase the options for testing and shorten the research time. Researcher-managed on-farm trials and even on-station trials can be undertaken simultaneously when appropriate, to incorporate basic agronomic research procedures such as replication avoidance. Laboratory based research may be undertaken on establish the science underlying indigenous or farmer-innovated practices’(Quddus,2000:62-63)

The protection of intellectual property rights should be accorded priority. Indigenous knowledge and practices with the potential for commercial use should be considered the
intellectual property of the individuals or communities. Citation of the names of innovators when documenting indigenous knowledge may be one way of accrediting intellectual property. The entrepreneurial farmer or community may be prompted and assisted to register their patent and trademark so that they can take legal action for unauthorized exploitation of their knowledge and innovations' (ibid:64).

Several government agencies and NGOs are now involved in the development indigenous knowledge related activities. The experiences and findings of these organizations should be exchanged to avoid unnecessary duplication and efforts should be made to integrate their work. A network of organizations interested in indigenous knowledge research and its potential for development should be supported. (Zuberi,2000:115)

According to Zuberi 'documenting and revitalizing indigenous knowledge and conserving biodiversity is of critical importance if we are to continue to benefit from the wealth of affordable, locally appropriate healthcare they provide to the rural poor. Present-day healers are generally elderly; most of them are in remote villages with no apprentices. There is a grave danger that much indigenous knowledge will be lost with them. It should be noted that the existing knowledge based traditional healthcare system has an extensive network in all villages linking poor, rural communities. This can be easily used to develop an inexpensive but effective community based service delivery system of primary healthcare and education. Additional training of these herbal practitioners will affirm and conserve their own indigenous knowledge and skills, will add to and improve their ability to address the needs of the local community and will protect their livelihoods (ibid:116)'}