BIOPIRACY OF TRADITIONAL KNOWLEDGE: ISSUES AND CONCERNS

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ABSTRACT

India is one amongst those nations that are enriched with biodiversity due to different combinations of ecosystem. There exist three levels of biodiversity in India namely species, genetic and ecosystem. All these levels are deeply rooted in the traditional knowledge and genetic resources of local and indigenous people. Although 1990's economic liberalization has deep impact on India's economic scenario in terms of country's industrialization, commercialization and urbanization. Side by side it has also lead to exploitation of traditional knowledge and genetic resources especially when intellectual property rights are applied to it to claim monopoly. As a consequence many plant varieties and animal species have become endangered. Moreover in India either this knowledge is codified or non-codified or one which is codified is written in local script very difficult to understand. Both at national and international level, these exist labyrinth of laws and organizations for the protection of traditional knowledge and genetic resources such as World Intellectual Property Organization (WIPO), Convention on Biodiversity (CBD), Trade Regulating Intellectual Property Rights(TRIPs), The Biodiversity Act, 2002, The Protection of Plant Varieties and Farmer's Rights Act, 2001 and The Patent (Amendment) Act, 2005. This paper is an attempt to critically analyze the present legal framework and make appropriate suggestions. The research methodology adopted is doctrinal (descriptive) based on secondary data source obtained from government official websites, books, journals and circulars.

Key words: Traditional Knowledge, Genetic Resources, Intellectual Property Rights, Monopoly, Convention on Biodiversity, World Intellectual Property Organization.

Introduction

The concept of Biodiversity or Biological Diversity, although is a scientific term, but represents variety of life on earth. It is the variety within and between all species of plants, animals and micro-organisms and the ecosystem within which they live and interact. Biodiversity is exposed at three levels namely genetic diversity, species diversity and ecosystem diversity.[1]. Article 2 (b) [2] of the Biodiversity Act, 2002 defines it as the variability among living organism from all sources including, interalia, terrestrial, marine and other aquatic systems and ecological complexes of which they are part. This includes diversity within species, between species and of ecosystem.

Concepts

It is to be noted that biodiversity embraces within its ambit traditional knowledge (hereinafter called as TK) and genetic resources (hereinafter called as GRs) of local and indigenous communities.Traditional Knowledge (TK) refers to the information, knowledge, know-how, skills and practices that are developed, sustained and passed on from generation to generation within a community, often forming part of its cultural and spiritual identity as well as to maintain the genetic resources necessary for the continued survival of the community.[3]

Genetic Resources (GRs) have been defined in the Convention on Biological Diversity (hereinafter referred to as CBD). They are part of biological materials that contain genetic information of value and are capable of reproducing or being reproduced. For example, medicinal plants, agricultural crops and animal breeds. Traditional knowledge is closely associated with genetic resources through the utilization and conservation of the resources, often

[1] National Wildlife Federation, "What is Biodiversity", *available at*:http://www.nwf.org/wildlife/wildlife-conservation/biodiversity.asp (last visited on Sep. 16, 2014).
[2] Article 2(b) of The Biodiversity Act, 2002. Also see, Article 2 of Convention on Biodiversity, 1993.
[3] World Intellectual Property Organization, *Intellectual Property and Genetic Resources, Traditional Knowledge and Traditional Cultural Expressions,WIPO publication* 933 E (2012), *available at:* http://www.wipo.int/tk/en/tk.pdf (last visited on Aug 21, 2014).

over generations and through their common use in modern scientific research. Reason TK often provides researchers with a lead to isolate valuable active compounds with genetic resources.[4]

Traditional Cultural Expressions hereinafter referred to as TCEs refer to all forms in which traditional culture is expressed. For example, dances, songs, handicraft, designs, ceremonies, tales or many other artistic and cultural expressions. They are integral to the cultural and social identities and heritage of indigenous and local communities reflecting case values and beliefs. They can be tangible or intangible. It is to be noted that TCEs are also understood as expressions of folklore.[5]

Biopiracy refers to illegal appropriation of life micro-organisms, plants and animals including knowledge that accompanies it. According to the Action Group on Erosion Technology and Concentration (ETC Group), biopiracy refers to the appropriation of the knowledge and genetic resources of farming and indigenous communities by individuals or institutions seeking exclusive monopoly control (usually patents or plant breeder's rights) over these resources and knowledge. [6]

Issues Related to Traditional Knowledge System and Intellectual Property Rights

Despite the fact that India has rich traditional knowledge, its exploitation is a major issue. Reason either it is codified or non-codified. The knowledge which is codified is written in regional language very difficult to be interpreted. As a result patents are often granted to the parties who are not the traditional owner of this knowledge. Thus not only the conflict arises between actual owner and the interested party but in maximum cases it has been found that no financial incentives are given to the actual owners.[7]

[4] *Ibid*.
[5] *Ibid.*
[6] Dr. S.K. Singh, *Intellectual Property Laws* 451-457 (Central Law Agency, Allahabad, 2013).
[7] Meeta Biswal & Debidutta Biswal, "Issues Related to Traditional Knowledge System and Intellectual Property Rights", *available at*: http://www.fao.org/docrep/article/wfc/xii/0911-a3.htm (last visited on Aug. 11, 2014).

Secondly the patent holders lack the responsibility of conserving this knowledge. As a consequence large scale exploitation of traditional knowledge and genetic resources occurs for profit maximization, thereby leading to the extinction of many species.

LIST OF INDEGENOUS PLANTS OF INDIA WHICH ARE PATENTED IN OTHER COUNTRIES [8]

Common Name/Botanical Name	US Patent No	Purpose
Kumari (*Aooe-barbadensis*)	5,652,265	Medicine
Amaltas (*Cassia-fistula*	5,411,733	Antiviral
Kalajeera (*Cuminum (Cyminum*)	5,653,981	Activates Immunity
Pomegranate (*Punica Granatum*)	5,411,733	Antiviral
Harad (*Terminaliachebula*)	5,529,778	Ayurveda
Aswagandha (*Withania Sommfera*)	5,466,452	Skin disorder

There exist many cases regarding traditional knowledge and genetic resources. For example Neem Case (2008), Tumeric Case (1995) patented under United States (US) Patent No. 5, 401, 504 and Basmati Case (1997) under US Patent No. 5, 663, 484.[9]

International Initiative to Regulate Traditional knowledge and Genetic Resources

At the international arena in the year 1980, the World Intellectual property Organization (hereinafter named as WIPO) and United Nation Economic Social and Cultural Organization (hereinafter named as UNESCO) convened a working group and drafted a Model for the Protection of Work of Folklore named as "Model Provisions for National Laws for the Protection of Expression of Folklore (hereinafter called as EOF) against illicit exploitation and other prejudicial actions.[10]

[8] *Ibid.*
[9] *Supra* note 6.
[10] K.Venkataraman & S. Swaranlatha, "Intellectual Property Rights, Traditional Knowledge and Biodiversity in India", 15 *Intellectual Property Rights Journal* 327-35 (2008).

Illicit exploitation refers to any utilization made both with gainful intent and outside the traditional or customary context of folklore, without authorization by a competent authority or the community concerned.[11]

Other prejudicial actions refer to four cases of offences subjected to penal sanction namely:

- Any unauthorized utilization of an expression of folklore where authorization is required;
- Using expression of folklore beyond the limits or contrary to the conditions of an authorization obtained;
- Creating the impression that what is involved is an expression of folklore when, in fact such is not the case;
- Expressions of folklore are distorted in any direct or indirect manner "prejudicial to the cultural interests of the community concerned".[12]

Currently the WIPO Intergovernmental Committee on Intellectual Property Rights (hereinafter referred as IPRs) and GRs, TK and Folklore[13] is considering the protection of TCEs of folklore through two processes namely:

- Consideration of an agreed list of issues considering the protection of TCEs/EOF; and
- Consideration of a draft set of "Revised Objectives and Principles for the Protection of TCEs/EOF.[14]

Innovations based on TK and GRs may benefit from patent, trademark, industrial design, unfair competition, geographical indications and trade secrets or confidential information. The intellectual property system can be approached from two different angles to ensure protection of TK and TCEs

PROTECTION OF TK and TCEs.[15]

[11] *Ibid*.
[12] Ibid.
[13] This committee is an outcome of 11th Session of WIPO held at Geneva in June 2007.
[14] *Supra* note 10.
[15] Ibid.

Defensive Protection

Protection against the third party from gaining illegitimate IPRs over TK and TCEs

Positive Protection

Prevention from unwanted, unauthorized or inappropriate use by the third party including culturally offensive or demeaning use to exploit TK/TCEs commercially by way of granting of licenses.

As far as protection of GRs is concerned, the relationship between IP and GRs is less clear. GRs are subjected to access and benefit-sharing regulations within the international framework defined by CBD and its Nagoya Protocol as well as by the International Treaty on GRs for Food and Agriculture of the United Nation Food and Agriculture Organization: Although WIPO is not directly regulating GRs but inventions based on or developed using GRs (associated with TK or not) may be patentable or protected by plant breeders rights

PROTECTION TO GRs

Defensive Protection

Prevention of patents from being granted over inventions based on or developed using GRs (and associated TK) which do not fulfill the existing patent requirements of novelty and inventiveness. For this purpose WIPO is taking help of data bases and guidelines and and adjustment of search tools and patent classification

Consistency and Synergy between the IP. System and the CBD (Access and Benefit Sharing)

Numerous country's have enacted domestic legislation putting into effect CBD obligations which provides that access to a country's GRs should depend on securing that country's prior informed consent (PIC) and agreeing to fair and equitable benefit sharing.[16] *[Article 15].*[17]

[16] Ibid.
[17] For details, see Article 15 of Convention on Biodiversity, 1993.

Systems.

Model Law for the IP- type Protection of TCEs (Sui Generis System)

In 1982, an expert group convened by WIPO and UNESCO developed a sui-generis model for the IP-type protection of TCEs also named as WIPO-UNESCO Model Provisions, 1982. Sui Generis (Specific, Special) systems are specialized measures aimed exclusively at addressing the characteristics of specific subject matter, such as TK or TCEs.[18]

Indian Initiative to Protect Traditional Knowledge

It is to be noted that Indian initiative to protect traditional knowledge can be divided into government efforts through governmental and non-government organization and legal provisions. The Council of Scientific and Industrial Research (CSIR), Indian Council of Agricultural Research (ICAR) and the Technology Information Forecasting Assessment Council (TIFAC) of the Department of Science and Technology, Government of Indian are together working for the documentation and conservation of traditional knowledge. In this direction the Government of India has prepared a traditional knowledge digital library (TKDL) on traditional medicine, plants and system, in turn leading to traditional knowledge resource classification. At present it consists of a database containing 34 million pages of formatted information on some 2,260,000 medicinal formulations in multiple languages. [19]

Legislative Efforts

To curb the menace of biopiracy of traditional knowledge, Indian parliament has enacted the following legislations

- The Patent (Amendment) Act, 2005;
- The Protection of Plant Varities and Farmers Right Act, 2001; and
- The Biological Diversity Act, 2002.

[18] Ibid.
[19]WIPO Magazine "Protecting India's Traditional Knowledge" WIPO Magazine (3) 2011, available at:http://www.wipo.int/wip_magazine/en/2011/03/article_0002.html (last visited on June 24, 2014).

The Patent (Amendment) Act, 2005

The consonance with TRIPs Agreement 1995 to which India is a signatory, India enacted its Patent (Amendment) Act, 2005[20] and introduced product patent along with some provisions relating to traditional knowledge. The main amendments are as follows:

- Section 25[21] has been amended so as to include both pre-grant [Section 25(1)] and post-grant opposition [Section 25(1)], thereby providing ample opportunity for local generic companies as well as other interested parties.[22] As per Section 25, where an application for patent has been published but a patent has not been granted, any person may, in writing represent by way of opposition to the controller against the grant of patent on the ground.
- That the complete specification does not disclose or wrongly disclose the source or geographical origin of biological material used for the invention;
- That the invention so far as claimed in any claim of the complete specification is anticipated having regard to the knowledge oral or otherwise, available within local or indigenous community in India or elsewhere;
- Non-disclosure of complete information regarding invention;
- Invention for which patent is claimed does not involve inventive step or industrial applicability; and
- That the invention so far as claimed in any claim of the complete specification was publically known or publically used in India before the priority date of the claim.[23]

It is to be noted that the above mentioned provisions are also applicable at any time after the grant of patent but before the expiry of a period of one year from the date of publication of grant of a patent.

The Protection of Plant Varieties and Farmers Rights Act, 2001

[20] Substituted in place of Patent (Amendment) Ordinance, 2004.
[21] See article 25 of the Patent (Amendment) Act, 2005.
[22] Section 2(1)(t) of Patent (Amendment) Act, 2005 defines interested person as person engaged in or promoting research in the same field as that to which the invention relates, is not exhaustive and can be broadly interpreted.
[23] See article 25 of The Patent (Amendment) Act, 2005.

It is to be noted that at the international level for the protection of a new plant varieties the International Union of Protection of New Varieties of Plants (hereinafter referred to as UPOV) was established in 1961. India is also the member of UPOV. The purpose of the convention is to recognize and to ensure to the breeder of a new plant variety or to his successor in title a right. With the same objective India introduced the Protection of Plant Varieties and Farmer's Rights Act, 2001 providing protection to the 'plant breeders' rights and all categories of plants excluding micro-organisms. The Act recognizes role of farmers as cultivators and conservers and the contribution of traditional rural and tribal communities in the country's agro-biodiversity by making provisions for benefits sharing and compensation and also protecting traditional rights of farmers. [24] The act provides for an effective system of protection of plant breeders rights as well as farmers and researcher's right. The farmer's rights include his traditional rights to save, use, share or sell his farm produce of a variety protected under this Act provided the sale is not for the purpose of reproduction under a commercial marketing arrangement. The Act provides for equitable sharing of benefits arising out of the use of plant genetic resources, accruing to a breeder from sale, disposal of seeds/planting material of a protected variety. In case their traditional or local variety is used for the development of new varieties, the village and farming community will be compensated. Under the act, the period of protection is 18 years for trees and vines and 15 years for other plants. [25]

Under Section 3[26] of the Act the Central Government will establish, the Protection of Plant Varieties and Farmer's Right Authority which shall perform the following functions:

- Promotion and development of new varieties of plants and protection of the farmers and breeders;
- Registration of extant and new plant varieties;
- Develop characterization and documentation of varieties;

[24] Dr. M.K. Bhandari, *Law Relating to Intellectual Property Rights* (Allahabad, Central Law Publications, 2012).
[25] Ibid.
[26] See, Section 3 of the Protection of Plant Varieties and Farmers Rights Act, 2001.

- Providing compulsory licensing of protected varieties if the right holder does not arrange for production and sale of the seeds;
- Collect statistics with regard to plant varieties seeds, and germplasm for compilation and publication. [27]

New variety shall be registered under this Act, if it conforms to the criteria of novelty, distinctiveness, uniformity and stability. In case of any extant variety, registration will be done within a specified period if it confirms to the criteria of distinctiveness, uniformity and stability. [28]

Section 24 provides for the duration of certificate of registration which shall be 9 years in case of trees and vines and 6 years in case of other crops and can be reviewed and renewal for the remaining period on the payment of prescribed fee.[29]

Section 39 of the Act confers the following rights to the farmers.

- Rights of registration to a farmer who has breed or developed a new variety.
- A farmers who is engaged in the conservation of genetic resources of land races and wild relatives of economic plants has right to bring improvements through selection and presentation which in turn shall be entitled for recognition and reward from the Gene Fund.
- Right to save, use, sow, re-sow, exchange, share or sell farm produce including seed of a variety protected under this Act in the same manner as he was entitled before the coming into force of this Act.[30]

The Biological Diversity Act, 2002

Being signatory to the Rio-de-Janeiro Convention on Biological Diversity also called as CBD, 1993, India is one among that member country's who enacted The Biological Diversity Act, 2002 with the following objectives:

[27] See, Section 8 of the Protection of Plant Varieties and Farmers Rights Act, 2001.
[28] See, Section 15 of The Protection of Plant Varieties and Farmer's Rights Act, 2001.
[29] See, Section 24 of The Protection of Plant Varieties and Farmer's Rights Act, 2001.
[30] See, Section 39 of The Protection of Plant Varieties and Farmer's Right Act, 2001.

- Regulation of access to biological resources of country for securring equitable share in benefits arising out of the use of biological resources;
- Steps for conservation and sustainable use of biological resources;
- Respect and protection of knowledge of local communities related to biodiversity;
- Secure sharing of benefits with local people as conservers of biological resources and holders of knowledge and information relating thereto;
- Conservation and development of areas of importance from the sandpoint of biological diversity heritage site;
- Protection and Rehabilitation of threatened species;
- Involvement of institutions of state government for the implementation of Biological Diversity Act, 2002.[31]

It is to be noted that in India Biological diversity is regulated by the Biological Diversity Act, 2002 and the procedure is regulated by Biological Diversity Rules, 2004.

Person's entitled to Access to biological Diversity in India

Section 3[32] of the Act provides the categories of persons not entitled to access to biodiversity[33] in India with approval from national biodiversity Authority (hereinafter referred to as NBA).

- Non citizen of India;
- Indian citizen who is a non-resident;
- A body corporate;
- Associations and organizations not incorporated or registered in India under any law for the time being in force which has any non Indian participation in the share capital or management.

[31] Supra note 6
[32] See, Section 3 of the Biodiversity Act, 2002.
[33] Biodiversity includes any biological resource occurring in India or knowledge associated thereto for research or for commercial utilization or for bio-survey or bio-utilization.

Rule 14[34] of the Biodiversity Rules, 2014 prescribes procedure to be followed by the party seeking access to biological resources and associated knowledge for research or for commercial utilization. Such party shall make an application in FORM I with fee of Rs. 10,000 to NBA. Later must dispose off the application within 6 months from date of receipt of application. The authority can also collect additional information from the applicant. It is to be noted that the application if approved will lead to a written agreement duly signed by the authorized officer and the applicant. The agreement should include objectives, description of biological resources and traditional knowledge, intended use of them, quantum of monetary benefits, commitment to minimize environmental impact, legal provisions pertaining to agreement duration, termination notice, the obligations in benefit sharing clauses, arbitration etc., submitting to authority a regular status report on research, guarantee to deposit reference sample of biological material and to adhere to the limit set by Authority on the quantity and specification of quality of biological resources for which applicant is seeking access. [35] Under Rule 14, the authority can also reject application, provided it should give a reasonable opportunity of being heard to the other party. Moreover, the authority will take appropriate steps to widely publicize the approval granted by any mode print or media. It is to be noted that Biodiversity Rule, 2004 are only regulatory in nature, not prohibitive in any manner to any applicant irrespective of their nationality, affiliation or origin.

Application for Intellectual Property Rights

Section 6[36] of the Act is the principal section dealing with intellectual property rights on biological resources and associated knowledge. Any person under Section 6(1) [37] cannot apply for any intellectual property rights in or outside India for any invention based on any research or information on a biological resource obtained from India, without prior approval of NBA before making such application and if a person applies for patent permission of NBA, it may be obtained after the acceptance of patent but before the sealing of the patent by the concerned

[34] See, Rule 14, The Biodiversity Rules, 2014.
[35] Ibid.
[36] See, Section 6 of The Biodiversity Act, 2002.
[37] See, Section 6(1) of The Biodiversity Act, 2002.

patent authority. Time period for disposal of application is 90 days from the date of receipt of application.

Section 6(2)[38] provides that while granting the approval, the National Biodiversity Authority may impose benefit sharing fee or royalty or both or impose conditions including the sharing of financial benefits arising out of the commercial utilization of such rights.

Section 6(4) [39] says that while granting such right, the concerned authority will endorse a copy of such document granting right to the NBA.

Revocation of Access or Approval

Rule 15[40] of the biodiversity Rules, 2004 provides that the authority either suo-motu or on the basis of complaint, may withdraw the approval granted for access and revoke the written agreement if the following conditions are satisfied.

- Violation of any provisions of the Act or the condition on which approval was granted;
- Non-compliance of terms of agreement;
- Failure to comply with any condition of access granted;
- On account of overriding public interest or for protection of environment & consummation of biodiversity. [41] Under Rule 15(2) [42] the authority sends a copy of every order of revocation to the concerned State Biodiversity Board and the Biodiversity Management Committee for prohibiting the access and also to assess the damage if any caused and takes steps to recover the damages.

Determination of Equitable Benefit Sharing

[38] See, Section 6(2) of the Biodiversity act, 2002.
[39] See, Section 6(4) of The Biodiversity Act, 2002.
[40] See, Rule 15 of The Biodiversity Rules, 2004.
[41] See, Rule 15(1) of The Biodiversity Rules, 2004.
[42] See, Rule 15(2) of The Biodiversity Rules, 2004.

Section 21[43] provides that the NBA before granting approvals under Section 19 and 20 must ensure that the terms and conditions subject to which approval is granted secure equitable sharing of benefits arising out of the use of accessed biological resources, their by-products, innovations and practices associated with their use and applications and knowledge relating thereto in accordance with mutually agreed terms and conditions between the person applying for such approval, local bodies concerned and the benefit claimers. Rule 20[44] of the biological Diversity Rules, 2004 provides criteria for equitable benefit sharing. This task is done by Authority by Notification in the Official Gazette and the authority may impose necessary terms and conditions for ensuring equitable sharing of the benefits arising out of the use of accessed biological material and associated knowledge. The authority stipulates that benefits must ensure conservation and sustainable use of biological diversity. The authorities in consultation with the local bodies and benefit claimers and with due regard to the defined parameters of access, the extent of use, the sustainability aspect, impact & expected outcome levels, including measures ensuring conservation and sustainable use of biological diversity approve the quantum of benefits mutually agreed upon between the person applying for such approval. Where biological resources or knowledge is accessed from a specific individual or group of individuals or ensure that the agreed amount is paid directly to them through the district administration.

The NBA while determining the benefit sharing will impose terms and conditions so as to secure equitable sharing of benefits. This benefit, interalia, includes: [45]

- Grant of joint ownership of intellectual property rights to the NBA, or where benefit claimers are identified, to such benefit claimers;
- Transfer of technology;
- Location of production, research and development units in such areas which will facilitate better living standards to the benefit claimers;
- Association of India scientific, benefit claimers and the local people with research and development in biological resources and bio-survey and bio-utilization;

[43] See, Section 21 of The Biodiversity Act, 2002.
[44] See, Rule 20 of The Biodiversity Rules, 2004.
[45] Ibid.

- Selling up of venture capital fund for aiding the cause of benefit claimers; and
- Payment of monetary compensation and other non-monetary benefits to the benefit claimers as the National Biodiversity Authority may deem fit.

Section 22[46] of the Act provides for the establishment of State Biodiversity Board for the States for advising the state government on matters relating to conservation of biodiversity, sustainable use of its components and equitable sharing of the benefits arising out of the utilization of biological resources, regulating by granting of approvals or otherwise request for commercial utilization or bio-survey and bio-utilization of any biological resource by Indians and to perform such other functions as necessary to carry out the provisions of this act. Under Section 41 of the Act Biodiversity Management Committee has been constituted by State Biodiversity Boards (SBBs). The main function of the Biodiversity Management Committee (BMC) constituted under each local body as per section 41(1) of the Act and rule 22 (1-4) of Biodiversity Rules ,2004 is to prepare people's Biodiversity Registers, which shall contain comprehensive information on the availability and knowledge of local biological resources and medieval or any other traditional knowledge associated with them.

Concluding Remarks

As consequence of unauthorized commercial exploitation of TK, TCEs and GRs of local and indigenous communities, there exit many instances of biopiracy around the world especially in the area of un-codified knowledge. TK, thus should not only be seen from the point of view of cultural, socio-historical interest but also economic interest. Following suggestions could be made in this direction:

- Effective steps to be taken for safeguarding and preservation of TK. The governments must get involved in wide range of collections, databases, inventories, registries, lists and other form of documenting and recording of TK. In the IPR context, documentation of TK can help protect TK, TCEs and GRs by keeping the information confidential or secret

[46] See, Section 22 of The Biodiversity Act, 2002.

record, accessible only by relevant community. Databases of TK and GRs can play an effective role as defensive mechanism within the existing patent system.

- Effective dialogue should be encouraged between the owners of TK, TCEs and GRs. They should be made aware about their rights. Moreover trained and expert staff should be employed for the purpose.
- Centre and State governments must support the establishment of sui-generis system for protecting TK, TCEs and GRs and their access.
- Issue of regional common heritage and common traditional knowledge due to geographical proximity/ethnic proximity needs to be effectively handled by way of classification and making data bases.
- Protective measures must be adhered to before the implementation of access benefit sharing measures (both to resources and TK/Transfer of Technology.
- There should be proper allocation of budget to facilitate the effective implementation of the Biodiversity Act, 2002. Moreover funding and organization of research programes in universities, government agencies, non-governmental organizations and community organizations for the purpose of identification, record and registration of traditional experts in agriculture, health case, fishing, animal husbandry through SBB and BMC must be encouraged.
- E-documentation and e-maintenance of databases related to TK, TCEs and GRs should be encouraged.