



## **FARMERS' RIGHTS IN INDIA AND BIODIVERSITY CONSERVATION- ISSUES AND PERSPECTIVE**

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### **INTRODUCTION:**

Biodiversity for food and agriculture is among the earth's most important resources. Crops, farm animals, aquatic organisms, forest trees, micro-organisms, and invertebrates - thousands of species and their genetic variability make up the web of biodiversity in ecosystems that the world's food and agriculture production depends on. Biodiversity encompasses not only wild flora and fauna, but also domesticated plants and animals. Over the past 100 years, geneticists, taxonomists, evolutionists, and ecologists have accumulated much knowledge about diversity. The information gathered attests to the importance of diversity for the proper functioning of many organism and ecosystems- Section 2(b) of the Biological diversity Act, 2002, defines the term biological diversity as the " variability among living organisms from all sources and the ecological complexes of which they are part and includes diversity within species or between species and of eco- system." Thus biodiversity does not mean the various species of plants and animals only but it is eases the ecosystems in which it is found and the interrelationship between various species. Human activities and interventions into biophysical system are directly responsible for the diversity of species, habitats and ecosystem. Proper appraisal of biodiversity, therefore must take into consideration all human activities based on a broader human ecological understanding, interactions with and among the other components of the biodiversity and their effects thereof.





Apart from the ethical and aesthetic reasons, is there any reason to fear that human survival is at risk if biodiversity is not preserved? Can human exist surrounded only by agricultural fields, planted forests, and other the like? This question is not easy to answer. In short, natural ecosystems can probably lose species without any great impairment of function. For instance, many planted forests are much simpler than the natural forests they replaced. As long as the environment does not change very much, ecosystems can apparently lose many of their rare species without any visible effects.<sup>1</sup>

India is a country with 70% people living in rural areas earning livelihood from agriculture. Farmers in India continue with traditional farming practices of using, growing saving, sowing and exchanging the seeds. Improvements in variety of seeds, plants with indigenous means or research and conservation of these varieties are collateral to the farmer's lives. Indian agriculture was alarmed with the introduction of terminator seeds technology which employs germination control as an I.P. protection. It compels the farmers to buy new seeds every year, which is a matter of grave concern to the poor countries. Thus it restricts the farmer's right to reuse and sell seeds, which was traditionally available to them. India's biodiversity is one of the twelve mega diversity regions of the world and constitutes seven percent of world's flora. It comprises about 8% of the world's known biodiversity in 2.4% of the entire global space occupied. India had an ancient tradition of paying constant attention towards the protection of the environment. There are writing galore, to show that ancient Bharat every individual had to practice Dharma to protect and worship nature and the other aspect of biodiversity.<sup>2</sup> The various component of biodiversity especially plant and marine organism benefits society as a source of new products and economic activities. Many of today's most important pharmaceutical





drugs are based on compounds originally found in diverse species of plants and other organisms. In India farmers have carried out innovations over centuries, are the original breeders and developers of biological resources in agriculture and thereby playing a vital role in conserving and improving primitive forms of wild species, land races and traditional varieties.

Biodiversity, and in particular genetic diversity, is being lost at an alarming rate. With the erosion of these resources mankind loses the potential to adapt to new socio-economic and environmental conditions, such as population growth and climate change. Presently, the ecological degradation, genetic engineering, unsustainable management of biological productivity and an inequitable regime of intellectual property rights (IPRs) are shaking the very foundation of biodiversity. With the advanced intelligence and scientifically supported technologies biological resources are being exploited; as a result in the last few decades human activity has ended up causing large scale loss of biodiversity. The extinction of species has accelerated manifold over its natural rate, which no human agency, not even the most brilliant scientist, can here lie the importance for its protection. Food security can be understood at different levels, from the household to the international level. It is commonly held that at present there are sufficient food supplies at the international level and in the Indian context at the national level as well. However, studies indicate that with increases in population, and diminishing land availability, international and national food security will be a major concern in coming years. To achieve food security at the national level states require sufficient resources to either produce or import enough food to feed the whole population and an efficient distribution system to ensure everyone access. Ensuring food security at the household level implies that people must either have sufficient income to purchase food or the capacity to feed themselves directly by





cultivating their own food.

The present research article explores the importance of the role played by the farmers in the conservation, enrichment and sustainable use of biodiversity in India. The thrust of IPRs in agriculture and food production does not recognize the contribution of the traditional farmers which is very important to preserve diversity and sustainability of society. The emerging IPRs regimes pose serious threat to biodiversity and cause apprehension to the traditional farmers as to their rights in recent year. Questions arises in the mind of the researcher is who owns biodiversity? Can intellectual contributions that modify or record biodiversity be the instruments to establish over these resources? What role the governments are playing for just and fair compensation to the contributors of knowledge and genetic resources? This paper is an attempt for a concerned effort towards scientific research, education and policy backup so as to conserve the extant biodiversity and critically analyze the legislative Endeavour's made at national level, recognizing farmers' rights.

### **International Perspective tof Farmers' Rights:**

Enforcement of IPRs regime on agriculture also raises the debate on the utilization of the world's biodiversity, raising questions such as who should have the right to generic resources derived from it, etc. *The International Treaty on Plant Genetic Resources for Food and Agriculture* is the first international agreement to deal exclusively with the management of plant genetic resources in agriculture. The Treaty takes account of varying conditions in different members of Food and Agriculture Organization (FAO) of the United Nation countries and does not specifically laid down any specific guidelines in this regard. It is left to national governments to decide for themselves what measures are appropriate to their particular need and purposes. This International





Treaty does not offer a definition of Farmers' Rights but simply describes the measures that need to be taken to protect and promote them. The Preamble to the Treaty underlines the responsibility of national government and emphasizes that the implementation of Farmers' Rights requires support at both national and international level. Article 9 of the Treaty obliges governments to assume responsibility for the upholding of these rights.

9.1 The Contracting Parties recognize the enormous contribution that the local and indigenous communities and farmers of all regions of the world, particularly those in the centers of origin and crop diversity, have made and will continue to make for the conservation and development of plant genetic resources which constitute the basis of food and agriculture production throughout the world.

9.2 The Contracting Parties agree that the responsibility for realizing Farmers' Rights, as they relate to plant genetic resources for food and agriculture, rests with national governments. In accordance with their needs and priorities, each Contracting Party should, as appropriate, and subject to its national legislation, take measures to protect and promote Farmers' Rights, including:

- (a) protection of traditional knowledge relevant to plant genetic resources for food and agriculture;
- (b) the right to equitably participate in sharing benefits arising from the utilization of plant genetic resources for food and agriculture; and
- (c) the right to participate in making decisions, at the national level, on matters related to the conservation and sustainable use of plant genetic resources for food and agriculture.

9.3 Nothing in this Article shall be interpreted to limit any rights that farmers have to save, use, exchange and sell farm-saved seed/propagating material, subject to national law and as appropriate.





Article 13.3 “The Contracting Parties agree that benefits arising from the use of plant genetic resources for food and agriculture that are shared under the Multilateral System should flow primarily, directly and indirectly, to farmers in all countries, especially in developing countries and countries with economies in transition, who conserve and sustainably utilize plant genetic resources for food and agriculture.” and 18.5 “The Contracting Parties agree that priority will be given to the implementation of agreed plans and programmes for farmers in developing countries, especially in least developed countries, and in countries with economies in transition, who conserve and sustainably utilize plant genetic resources for food and agriculture.” stipulate that benefits arising from the use of plant genetic resources for food and agriculture should flow to farmers , who conserve and sustainably utilize plant genetic resources for food and agriculture. The debate about GATT Final Act in relation to its impact on agriculture has pitched the farmer at the centre of attention , The debate around the issues of biodiversity, more particularly around conservation of biodiversity also raises questions on the rights of farmers and the traditional farming practices. It was the profound understanding of multidimensionality that made it possible for the traditional farmer to understand nature and thus evolve the myriad forms of traditional agricultural practices throughout the world. Diversity as multidimensionality means not just a variety of crops, but also a multiplicity of uses for a single plant. Different types of cultures produced different types of agricultural system, and different types of agricultural system produced different types of cultures. Towards the end of the 20th century and in the beginning of the 21st century however, the richness and greatness of this diversity is most threatened due to the enforcement of IPRs regimes in agriculture which does not recognize the contribution of the farmers to the world's biodiversity.





### **Biodiversity and Farmers in India: Issues**

At the outset, it must be mentioned that plant variety protection can have a narrow and broad meaning. The narrow view only considers plant variety protection from the point of view of commercial breeders and the needs of the biotechnology industry. The broader view acknowledges that there are different actors in plant variety management who deserve protection and who perform different functions, ranging from innovation (new seeds) to agro-biodiversity management. The Indian Agriculture Census of 2005/2006 shows that 83% of the farming community comprising small and marginal farmers have an average holding size of less than 2 hectares of land. According to the 59th Round of the National Sample Survey 2, 11% of rural households in India are landless (GOI 2007). However, taken together these groups own more than 60% of the country's livestock resources, and almost half of their income comes from livestock (Goswami 2007). About 75% of the estimated 70 million milk animals are owned by landless, marginal or small farmers. Thus, most rural milking households own only one to three animals, and it is estimated that only around 15% of households own more than 4 milk animals (GOI 2007).

India has had a number of reasons for introducing a plant variety protection regime. The most immediate trigger for the Plant Variety Act 2001 are the obligations undertaken in the WTO context, specifically under Article 27.3.b of the TRIPs Agreement. Article 27.3.b of TRIPs imposes on all countries the introduction of some form of intellectual property protection for plant varieties. With the domestication of crops, farmers increased the diversity within each crop which made them fit into myriad environments to which they were exposed. At present the government is keen to introduce genetically engineered varieties of rich,





which are drought, flood and salinity of plant varieties, which are resistant to various risks like drought, flood etc. and are more suited to national conditions. These indigenous varieties developed by traditional farming are proved as environment friendly and has a positive impacts to ecology. Since long the farmers' have been performing the role of commercial breeders, not through biotechnological methods, but through traditional and location specific agricultural practices, and they have tried and tested them and their effects on ecology . Indigenous peoples have also discovered a vast array on medicinal plants, and are still using many of these from generations. World Bank Report (1998) has shown that 25% of medicines as contribution from indigenous knowledge (IK) world. Of the estimated 250000 to 500000 plant species in the world, more than 85% are in environments that are the traditional homes of indigenous people. These core concerns were first raised internationally at the Earth Summit at Rio in 1993 with the subsequent production of the International Convention on Biological Diversity. The three main goals of the convention as cited by Cox (2000) are:

1. Respect, preserve and maintain traditional knowledge
2. Promote wider application of traditional knowledge
3. Encourage equitable sharing of benefits from traditional knowledge

The convention is an important step in the protection of IK but there are concerns that it does not go far enough to protect IK from bio-piracy. (Takeshita 2001; Oxfam 2003) Unequal power relations in international relations and international law are clear obstacles to both justice and adequate protection in many cases.<sup>10</sup> The new landraces and breeds were considered to be a part of nature, and were not used for individual profits; rather these were treated as common resources for common good. There was a free exchange of information relating to the use of the various components of biodiversity among these communities, which led to the addition of diversity and sustainable use of biodiversity.







### **Farmers' Rights and their Recognition : Legal Perspective**

TRIPS plus Intellectual Property Rights and Geographical Indications: Under the Trade-Related Aspects of Intellectual Property Rights (TRIPS) agreement, patent protection must be granted for a period of 20 years for products and processes in all areas of technology, provided that these are new, inventive and capable of industrial application. Pursuant to Article 27.3 (b) this also applies on a binding basis to micro-organisms as well as microbiological and non-biological processes for the production of plants or animals. One important concession to the developing countries under the TRIPS agreement was, however, that they can introduce instead of patent protection an 'effective sui generis system' more suited to the special development needs of the country in question. In the negotiations on the FTA, however, the EU from the outset pressed for an obligation to prescribe the standards of the Union for the Protection of Organic Varieties (UPOV) as amended in 1991 as the only possibility for a sui generis system (UPOV 1991). Such a provision would require India to allow the re-sowing, exchange and sale of commercial seeds only in exceptional cases and subject to the payment of license fees. India, where 85% of seed comes from exchange between farmers, is the only major economic power that has not yet signed an UPOV agreement (De Schutter 2009: 6). By mounting a broad campaign Indian farmers' organisations, NGOs and academics succeeded in having a law passed in 2001 – the Protection of Plant Varieties and Farmers' Rights Act – that made more or less exhaustive use of the scope for a sui generis system to protect farmers rights, setting an international precedent. Under this law farmers are expressly permitted to preserve, use, sow, re-sow, exchange and sell the products and the seed itself. Essential elements of this law would now be called into question if India were forced to implement the standards of UPOV 1991 as a result of the





Free Trade Agreement (Suhai 2008: 11f. and 21f.). Right now it looks rather unlikely that the Indian Government will accept a UPOV obligation in the agreement, although the EU still seems to be exerting pressure in this direction (Bhutani 2011: 4f.). In 2001, the International Treaty on Plant Genetic Resources for Food and Agriculture (FAO International Treaty) was adopted by the FAO. It provides for the recognition and realisation of Farmers' Rights. The FAO International Treaty recognizes past, present and future contributions of farmers in all regions of the world in conserving, improving and making available plant genetic resources for food and agriculture as the basis of Farmers' Rights. The Convention on Biological Diversity (CBD) is the response of the World community to preserve the ecological basis of biological production through biodiversity conservation. There are two main aspects of CBD. *Firstly*, it has recognized the national sovereign right of countries to their biological Wealth, *Secondly*; it has recognized the contribution of indigenous communities to knowledge about the utilization of biodiversity. The growth of technologies, which raised the commercial value of genetic resources combined with the loss of biological diversity worldwide, has led to the narrowing of the free exchange principle. The contribution of public and private sector institutions in industrialized countries tend to be considered patentable innovations, while the role of indigenous and local communities in developing and conserving land races or traditional healers' knowledge of medicinal plants are under valued.<sup>11</sup>Farmers seed embody a significant intellectual contribution by traditional practices, generations after generations. Monopoly of traditional company (TNC) in seed through IPRs is neither desirable nor necessary even from the public interest perspective<sup>12</sup>.

The resolution Food and Agriculture Organization (FAO) defines farmers' rights as 'Rights arising from the Past , present and future contribution of farmers in conserving, improving and making available





plant genetic resources, particularly those in centre of genetic diversity . These rights are vested in the international community as trustees for present and future generations."<sup>13</sup> The Conservation of biological Diversity (CBD) goes beyond the FAO undertaking on PGRs provides an opportunity to governments to protect agricultural biodiversity. Farmers' livelihood and sovereign rights to biodiversity which could be seen in the recognition of nations' sovereignty and ownership of diversity. With the recognition of sovereign ownership in the CBD, farmers' rights can be re-conceptualized as ownership rights and creativity can be linked to sovereignty.<sup>14</sup> Farmers' Sharing and Farmers' Privileged, Benefits Sharing and Farmers' Rights as Ownership are the three basic aspects of 'farmers rights'. They are still in the process of being applied and interpreted in developing countries.

In India, from the immemorial period the farmers, tribal's , pastoralists, herbalists and fisher folk have great contribution to the biodiversity which they have considered and used .They must be allowed to participate actively in decisions that have impact on the status of their rights and the status of biodiversity. The first public demonstration of the positive assertion of farmers' right took place in India on Independence Day, August 15, 1993, when farmers declared that their knowledge and biodiversity is protected, by a ' Samuhik Gyan Sanad". Therefore the idea of farmers' rights as a sub category of community rights needs to be evolved which recognize the creativity and protects the livelihoods of diverse communities and set limits and boundaries on the domain of monopoly protection shaped by IPRs. The farmers started to assert their right to seed through, community Intellectual Rights (CIRS).India is among the first countries in the world to have passed legislation granting Farmers' Rights in the form of the Protection of Plant Varieties and Farmers' Rights Act, 2001. India's experience is important due to its international contribution to negotiations on Farmers' Rights,





its position as a centre of biodiversity, and the complexities of agriculture in India within which the country is attempting to implement these rights. The positive assertion of farmers' rights, create an opportunity to the supreme law making authority to take into consideration the role of traditional farmers in protecting the rich biodiversity and improving the plant genetic resources(PGRs) in India .It also create an opportunity. to define and give recognition to farmers' right in India which can be seen in the Protection of Plant Varieties and Farmers' Rights Act,2001, without which the conservation of biodiversity is , perhaps, impossible. The Act intends to provide an effective system for protection of plant varieties, the rights of farmers and plant breeders. cognition and protection the rights of farmers in respect of their contribution made at any time in conserving improving and making available plant genetic resources for the development of new plant varieties is one of the main objects of the Act. A farmer who had bred or developed a new plant variety shall entitled for registration and other protection in like manner as a breeder of a variety under the Act. The Act ensures the farmers' rights to save, use, sow, reshow, exchange, share or sell his farm produce including seed of a protected variety under this Act. It recognizes the role of farmers, traditional, rural and tribal communities as cultivator and conservers, and their contribution to the country's agro- biodiversity by rewarding them from the Gene Fund through benefit sharing. The authority under this Act is empowered to invite claims of benefits sharing to the variety registered. The study of the Act shows that. being a signatory to the agreement of Trade Related Aspects of Intellectual Property Rights(TRIPs), India has responded favorably and opted for a sui generis system. In spite of having some complications in implementation, the Act is the first legislation of the world to grant formal rights to the farmers' and recognizes the contribution of the local communities for





conservation of biodiversity. Apart from well defined breeders' rights, it has strong proactive farmers' rights.

### **The Biological Diversity Act, 2002**

The Biological Diversity Act, 2002 is also a very important step in this regard. The Act primarily aims at regulating access to genetic resources and associated knowledge for the purpose of securing equitable sharing of benefits arising out of these resources and knowledge with the local people, who are conservers of biological resources and holders of knowledge and information relating to the use of these resources. This also protects knowledge of local communities related to biodiversity. The concept of benefits sharing is innovative under this Act so far as it provides that the Authority can decide to grant joint ownership of monopoly intellectual right to both the inventor and the Authority or to the actual contributors such as farmers if they can be identified. By the creation of the National Biodiversity Fund, the Act seeks to channel benefits "to the conservers of biological resources, creators and holder of knowledge" but does not recognize the biodiversity related community Intellectual Property Rights" The provisions for such a rights are essential for the proper recognition of farmers' contribution to develop, preserve, and sustainable use of biodiversity. The act tried to put our law in compliance with the requirements of the Conservation of Biological Diversity (CBD) to which India is a signatory. The Act focuses mainly on bio- piracy and benefits sharing; does not provide any mechanism to check the impact of monoculture on biodiversity, generated by the introduction of IPRs in biotechnology more specifically in agriculture.

### **The need for a broader conception of farmers' rights:**

The preceding section indicates that there are some general and some





specifically problems in the adopted legal regime for plant variety management and protection. A number of these problems are of a technical nature and relate, for instance, to the lack of coordination between the different acts. One more substantive issue is the question of farmers' rights or the rights of farmers over their traditional knowledge. The need to find a more comprehensive answer to this issue has been made more pressing with the rustication by India of the new PGRFA Treaty. This importance of this treaty is linked to the fact that it directly links biodiversity conservation, biodiversity use and farmers' rights and to the fact that it constitutes a direct response to the introduction of intellectual property rights in agriculture through patents and plant breeders' rights.

The possible shape of a comprehensive farmers' rights regime at the domestic level can be suggested. **Firstly**, There is need to give full control over their knowledge by allowing farmers to commercialize their own knowledge. It should be conceived as a positive mechanism giving traditional knowledge holders property rights. A further justification for the introduction of farmers' rights is the role that property rights play in fostering the sustainable use and the conservation of resources due to the intrinsic link between the knowledge and the resource and the requirement of ownership of both to foster their conservation. If this is not achieved, there is a significant danger that farmers' rights will be used only as a way to force poor farmers to maintain agro-biodiversity for the global good of humankind with minimal personal rewards.<sup>19</sup>

**Secondly**, agro-biodiversity management should also have duties towards the promotion of food security, agro-biodiversity conservation and sustainable use. While farmers directly benefit from agro-biodiversity conservation, the global community also benefit in direct and indirect ways. Thus there is need of the sharing of conservation obligations on an equitable basis between all benefiting from the





exploitation of agro-biodiversity. This burden should not only be spread amongst farmers and local firms marketing seeds, foodstuffs and other crops but also at the international level, given that outside firms, individuals and eventually the international community benefit from these conservation activities.

**Thirdly**, the question of the introduction of farmers' rights includes important issues concerning the holders of the rights. Intellectual property **rights** such as patents are often conceived as purely individual rights even though in practice, they can easily be shared among several individuals or entities. Intellectual property rights can less easily lend themselves to shared management in the case of a unidentifiable number of rights holders. As a result, it will be necessary to develop new tools to take into account the special nature of knowledge pertaining to plant genetic resources.

**Fourthly**, the question arises of the uses to which farmers' rights can be put. From a broad perspective, the former will be there to help farmer's fight the appropriation of their resources and knowledge with legal tools. Today, the whole of 'traditional knowledge' is deemed to be in the public domain because it cannot be assigned through patents or plant breeders' rights. Farmers' rights constitute a first step towards re-establishing a fair playing field in which all actors have claims over their knowledge. Farmers' rights will also constitute the basis for claims of benefit-sharing as recognized at the national and international levels. The positive function of farmers' rights is the most innovative and important in the long run. The commercial use of the protected knowledge may serve as an added bonus which traditional knowledge holders may or may not use.

### **CONCLUSION:**

India's existing international obligations and to the general trend towards the privatization of knowledge in recent decades needs to





focus on the protection of Farmers Rights. The introduction of diverse forms of intellectual property rights in the agricultural field is on the whole completely novel .This new system is in complete contradiction with the previous system of agricultural management which privileged the sharing of resources and knowledge concerning plant varieties by all actors from local farmers to those at the international level. The farmers' right is of great importance and amongst the border challenges associated with the introduction of IPRs in agriculture such as food security. Farmers' rights are intrinsically based on recognition that there is link between innovation, rights over knowledge, biodiversity conservation and the sustainable use of agro-biodiversity. With the revised WTO scenario and privatization of agriculture the intellectual property rights and plant breeders' rights are prerequisite. In India majority of the farmer's are poor and marginal and are not aware of their rights and in such a situation India's existing international obligations and to the general trend towards the privatization of knowledge in recent decades needs to focus on the protection of Farmers Rights. The introduction of diverse forms of intellectual property rights in the agricultural field is on the whole completely novel .This new system is in complete contradiction with the previous system of agricultural management which privileged the sharing of resources and knowledge concerning plant varieties by all actors from local farmers to those at the international level. Community IPRs system is a suitable mechanism to protect their rights. Traditional farmers also play the roles of breeders of new varieties and enrich biodiversity to a great extent even though their breeding objectives and methods differ from objectives and methods of seed industry. Farmer's rights must be interpreted as to the right of ownership over the plant generic resources (PGRs) which they have developed. Therefore, the national legislation should develop in such a way, which could extend







the circle of potential holders of patents and make patent available to local communities. Community IPRs are premised on the idea that the current patent system only recognized the northern industrial model of innovation. In this sense, the introduction of farmers' rights fulfils a number of significant functions both from a socio-economic and socio-ecological point of view:

- Farmers' rights contribute to making the legal system fairer by providing property rights to all relevant actors in plant variety management;
- Farmers' rights contribute to the recognition of the contribution of farmers to food security, to conservation and sustainable agro-biodiversity management and to innovation in agricultural management; and finally
- Farmers' rights will make an enormous contribution to food security by fostering control, not only over resources and land but also over knowledge for the dozens of crores of people who are directly engaged in small-scale agricultural management.

The idea is therefore, to foster intellectual property laws which recognize more informal, communal system of innovation through which farmers and indigenous communities produce, select, improve, and breed a diversity of crop and livestock varieties. There is need of sincere attempt to evolve a legal mechanism that takes care of various competing interest for conservation, protection and sustainable use of biodiversity. Maintaining biodiversity for food and agriculture is a global responsibility.

#### **REFERENCE:**





Aaradhana Salpekar, Dr. Kadambari Sharma, "Encyclopaedia of Ecology And Environment- Natural Resource Conservation, Vol.-5 pg no.232Dr

C.M. Jariwal," (1992) Changing Dimensions of Indian Environmental Law" in P. Leelakrishnan et al (eds), Law and Environment, 2

According to Paragraph 1 of the Plan of Action of the World Food Summit, Rome, 13-17 Nov.1996, food security exists 'when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life'.

Carl F. Jordan, 2002, *Genetic Engineering, the Farm Crisis and World Hunger* 52 BIOSCIENCE 523, 526 and Jose Falck-Zepeda *et al.*, biotechnology and sustainable livelihoods- findings and recommendations of an international consultation isnar, briefing paper no. 54.

indian economic survey 2001-2002 (2002).fao, the state of food insecurity in the world 2002 (2002).

<http://www.fao.org/Ag/cgrfa/itpgr.htm>

Lawrence Surendra & N.S. Gopalakrishnan," Intellectual Property, Seeds, the future of Farmers and Farming" 5, SCC(J)11-20

Government of India: Agricultural Census Database. Various Years.  
<http://agcensus.dacnet.nic.in>

[http://www.ghwatch.org/sites/www.ghwatch.org/files/indig\\_kph.pdf](http://www.ghwatch.org/sites/www.ghwatch.org/files/indig_kph.pdf).

A.H. Ansari," 2012 Scientific Aspects of the Conservation on Biological Diversity: Perspective and Challenges"

<http://www.twinside.org.sg/index.htm>

S.K.Chakraborty, (2010), Conservation of Biodiversity and Farmers' Rights in India : Issues and Perspective" published in Legal News & Views Vol 24 No10.

FAO Conference-Rome, 1989, Resolution 5.89.





S.K. Verma, (1997). " Biodiversity and intellectual Property rights" 39(2-4) JILI 211

Vandana Shiva, (1996) "Agricultural Biodiversity, Intellectual Property Rights and Farmers' Rights" XXXI(25) EPW 1628.

S.K. Verma ,(2001) " Access to Biological and Genetic Resources and their Protection." 43( i) JILI 1-24.

FAO Commission on Plant Genetic Resources, Revision of the International Undertaking. Analysis of Some Technical, economic and Legal Aspects for Consideration in Stage II: Access to Plant Genetic Resources, and Farmers' Rights, Doc. CPGR-6/95/8 Supp.

Phillippe Cullet, (2005).Intellectual Property Protection and Sustainable Development 242-243

