Breeding, benefits and bridges with modern science: Giving innovative farmers their due[1]

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In conformity with the preamble of the treaty, a farmer and an advocate for their rights together present before you a case for strengthening various provisions of the treaty such that the bridges between farmer breeders, institutional scientists, private seed companies and public bodies are built in a synergistic manner. It is true that much of the contribution of farmers forms the foundation of the development of the varieties by public and private institutions. And yet, not much benefit has flown towards the farmers so far. Honey Bee Network and SRISTI (Society for Research and Institutions for Sustainable Technologies and Institutions) have worked hard to give voice and visibility to the efforts of farmer innovators and traditional knowledge holders.

In the first part, Sunda Ram, a farmer breeder and a Honey Bee Network collaborator from Danta Village, District Sikar, Rajasthan, India will present his experience of developing varieties and articulate the expectation from the treaty.

In second part, Anil Gupta, Coordinator, SRISTI, founder, Honey Bee Network and NIF (National Innovation Foundation) will share the policy alternatives. He will also make suggestions about the portfolio of monetary and non-monetary incentives which can be given to individual and communities engaged in conserving, augmenting and disseminating agro biodiversity.

Finally, some of the unresolved issues will be flagged so that the treaty members can help advance the cause of farmers' rights. There is a tendency to spend far more resources and time on discussing the rights of growers and consumers of farmer varieties compared to the discussion on the rights of farmer breeders and conservators. In the interest of promotion of grassroots innovations by farmers, we need to balance our approach.

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Part I

A farmer's perspective[4] on farmers' rights

While cultivating six hectares of land in a semi arid region with rainfall of less than twenty inches annually, I have faced tremendous risk and uncertainty. I have developed many technologies including a method of growing trees which requires only one litre water once in their life time. Afterwards, almost 85 per cent of the seedlings survive through natural rainfall. One of my constant challenges has been to look for varieties of different crops that I grow, select potentially promising lines and find more productive, pest and disease resistant varieties. Having been a member of Honey Bee Network for over twelve years, while scouting for other innovators and traditional knowledge holders, I have noticed that many farmers are not aware of the potential that some of their traditional varieties may have. Through various selections of off-type plants which may have promising properties, I have selected many varieties. The most distinguished varieties that I have developed are: a variety of chilly (daanta selection). It has very high colour value and the buyers come to my farm to buy all the chilly that we grow; a variety of gram (SR 1) which has the larger grain size, higher productivity and requires less water; new varieties of pulse and guwar, requiring less water, shorter duration and higher yield. I have also screened varieties developed by other farmers received by Honey Bee Network so that apart from the valuation done by the scientists, I can generate independent assessment through my own farm trials.

While doing various selections, I have faced several problems which prevent me from realizing my rights under the PPVFRA and the Treaty properly. For instance, I have characterized a variety in my own way but unless it is also characterized by the National Bureau of Plant Genetic Resources or state agricultural university or department, it may not carry the same effect. Once the characterization is done, other farmers will have more trust in the claims.

Just as scientists get resources for screening varieties, farmer breeders like me should also get resources to screen varieties developed by other farmers and some times even by scientists. I appreciate the support given by NIF and Honey Bee Network to me for this purpose.

The varieties developed by institutional scientists are given opportunities of multi location trials, demonstration and seed multiplication. But, the varieties that I developed do not often reach the other farmers in distant locations because I lack resources for the purpose. I cannot advertise my varieties and I cannot distribute samples for popularizing it. Therefore, the diffusion of my varieties even when they are better than the institutionally developed varieties does not take place enough. The food security is linked to the farmers' security. International Treaty provides opportunity for benefit sharing and access to new varieties. Farmers do not mind sharing their varieties. I have never hesitated in giving seeds of my selection to other farmers. But, when seed

[4] It is written in first person from the point of view Shri Sunda Ram Verma, a pioneering farmer and an old member of Honey Bee Network, and collaborator of SRISTI.

companies or private traders or farmer traders came to know about my variety, they contacted me and I gave them seeds in good faith. Later, the traders and seed companies may have diffused my variety but I got know compensation or other durable benefits. The fact that I am standing before you and making a case for strengthening the Treaty shows that the promise of the Treaty is not hallow. It has already begun to recognize farmer breeders as well as conservators of agro biodiversity. I hope that Prof. Gupta would highlight the mechanisms both at national and international level through which farmers like me can have better options for protecting my rights.

Part II

When we[5] started Honey Bee Network about two decades ago, we had not realized that creative potential of farmers, both individuals as well as communities was so rich and widespread. Out of about 70000 innovations and traditional knowledge documented by Honey Bee Network collaborators and deposited with NIF, about 20000 are contributed by SRISTI. Large number of farmer breeders have been scouted who have developed varieties of cereials, pulses, oil seeds, plantation crops, and medicinal and aromatic plants. In one case, a variety of paddy popularly known as HMT developed by Dada Khobragade has refused over million hectares in several southern, central and western Indian states. In some of the districts of central India, it is the variety of first choice by the farmers. A recent doctoral research study has revealed that for a character like thinness of grain, PPVFRA uses this farmer bred variety as a reference (Sinha, 2007, personal communication[6]). Subsequently, this variety was taken up by the state agricultural university scientist to purify and then release as PKV HMT. However, the DNA finger printing studies at Centre for Cellular and Molecular Biology (CCMB), CSIR lab, under the guidance of Dr. Ramesh Agarwal have revealed that PKV HMT is essentially the same variety as HMT (Sinha, 2007, personal communication). Several seed companies have earned millions of dollars by selling the seed of his variety. But, the farmer continues to be very poor and got no benefit whatsoever from the prosperity it brought to thousands of farmers and dozens of seed companies. It is obvious that in such cases, the benefit sharing can only be facilitated by the national authorities.

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[5] Rest of the paper is in first person by Anil K Gupta. The 'we' here refers to all those who came together to form Honey Bee Network.

[6] Ms Riya Sinha Chokkakula has taken up doctoral studies at Wageningen University, Netherland based on analysis of the motivations, triggers and incentives or disincentives for diffusion for grassroots unaided innovations by farmers and artisans. She has been involved with the Honey bee network for over ten years and has edited the newsletter and also is a board member of SRISTI.

The other varieties developed by the farmers which have provided unique properties. Morla variety of groundnut developed by Thakarshi bhai in Saurashtra had two particular characteristics not reported from the many national and international collections. One was a strong peg which meant that not many pods were left in the ground while digging it. Second, smooth surface of the pod, i.e., the absence of the ridges so that soil did not get deposited in the grooves making the pod heavier and thus liable to be left in the soil while digging the groundnut. Scientists did not pay much attention to these two peculiarities. Large number of farmers varieties get rejected either because of being compared on wrong parameters or with wrong reference points. It is very important that farmer breeding is seen not just as an yield improving exercise but also as an effort to tailor local diversity in the germplasm to suit the specific needs. In a study on matching breeders objective with farmers choices (Gupta, 1984), I had shown that while scientists selected varieties in dry regions with higher harvest index, the farmers did the opposite. In the farmers' varieties, there was more straw than grain. It was obvious that farmers being dependent upon livestock gave much more importance for the content and quality of fodder which most crop breeders somehow give less attention to. Farmers also identify sometime unique characters of which the real significance manifests after a long time. For instance, Dulha bhai in Sabarkanta district of Gujarat, found two plants of pigeon pea having red colour flower and early bearing. The significance of the colour was that while yellow colour attracted lot of pests, the red did not. Such a finding has not come out of the large national and international programme till then. White flowered cardamom, dwarf jack fruit, less pungent and deep coloured chilly variety, viz., rasham patto of sarmath (Sinha, 2007) became a variety of choice for pickles for a long time.

The promotion of farmers' rights requires several articles of the Treaty to be strengthened and implemented much more strongly. Let me make some specific observation and suggestions about the importance of the Treaty for Honey Bee Network members and many other farmer rights groups.

a. The multilateral system of access and benefit sharing provides certain norms for exchange of materials across countries. The tracking system of such exchange has to be developed so that farmers and their community can track as to whose material is being used in the breeding programmes in the public or private sector within or outside the country. A farmers rights based grassroots information system will have to be developed to inform and empower the communities and the individuals.
b. For registration of the varieties with the National Plant Variety and Farmers' Rights Authority, considerable amount of data is required. It is not going to be possible for farmers to generate the data without the help of scientists. The treaty must organize international and national fund[7] to finance generation of data and ensuring or facilitating negotiations for benefit sharing.
c. The benefit sharing can be in monetary or non-monetary terms aimed at individuals or groups. Honey Bee Network would like to cooperate and partner with CGFRA so that a roaster or a catalogue of farmers varieties for

[7] India has no such dedicated agency or fund at present. Support that NIF provides to such farmer breeders is perhaps the only mechanism available.

wider dissemination could be developed. A variety seldom gets released as such elsewhere or directly used in the breeding programme. The derivative crosses pooling characteristics from many farmer varieties or land races are often used in developing new varieties in the formal research systems. Tracking contribution of different farming communities and individuals in such crosses is difficult but not impossible. We have to create examples of benefit sharing within and across the countries so as to reinvigorate the exchange of germplasm across the countries[8].

d. One of the rights that farmers would prefer to exercise is to have access to the other farmers' varieties for testing, screening and value addition at their end. We have to create funding mechanisms for farmers who conserve local varieties of their regions at their farm, develop new varieties and for screening selections from other farmers. A parallel coordinated research programme of farmer breeders needs to be developed at the international level. Not only will it empower the innovations by farmer breeders but also generate new insights about the correspondence between ecological conditions and the shaping of agro biodiversity.

e. Farmers have been quite aware of the food processing and nutraceutical properties of many of the varieties. However, the descriptors used by the gene banks around the world persistently ignore the data on such valuable knowledge. The implication is that the food processing and the nutracetical industry is not able to create market for such valuable land races and farmers varieties. Obviously therefore, benefits do not flow. This is particularly true for high fiber containing minor millets.

f. The evaluation of farmers' varieties under very differently managed research farms, sometimes, does not allow full potential to manifest. Therefore, the proposed network of farmers breeders around the world on the pattern of Honey Bee Network would require institutional mechanisms of information exchange, technical and financial support for proper evaluation of the varieties and for submission of application to the national plant variety authorities. By restricting benefit sharing only to the use of unmodified germplasm, we are limiting the scope of the Treaty a great deal. Benefit sharing must take place if the characteristics identified and described by the farmers are incorporated in the varieties (that is, the gene transfer so that biotech industry also comes under the purview of ABS) developed by private or public sector.

There are many other modifications that can be made to strengthen the Treaty and its objectives. The correspondence between the IPR laws and the new plant variety and seed legislations in many countries is not easy because the plant variety laws do not incorporate the concept of farmers' rights as done in India. The benefit sharing is to be encouraged and non-mandatory if the product is made available to others without restrictions for research. Wherever breeders exemptions are incorporated, the same

[8] It is well known among the plant breeding community that the international germplasm exchange has come down drastically in the recent years. This is not good for the breeding programmes and consequently for the farmers.

conditions may apply[9]. Rather than relying only on the legal instruments, the seed companies and other users of genetic diversity in biotech industry should be encouraged to contribute regularly to the gene fund. Otherwise it will remain a failed promise.

SRISTI and Honey Bee Network are committed to advance the cause of farmers' rights and building of bridges between formal and informal science. The treaty provides a viable platform for forging such bridges. We hope that member countries will come forward and encourage farmer to farmer exchange of information, germplasm and knowledge and experience in dealing with public and private agencies.

[9] I appreciate discussion with Dr Sanjeev Saxena, NBPGR, New Delhi on this issue.