

IDENTIFYING LEGAL CHALLENGES FOR FARMERS' INNOVATION

By Saurav Ghimire



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On 9 October 2023, an expert workshop on “Identifying Legal Challenges for Farmers’ Innovation” was organised at the Centre for Private and Economic Law, Vrije Universiteit Brussel, in collaboration with the South Centre and Université Catholique de Louvain. The hybrid event gathered experts to discuss the challenges for farmers’ innovation, particularly those emerging from regulatory regimes. The workshop brainstormed policy and regulatory hindrances to farmers’ involvement in plant breeding, namely, in access to breeding materials, access to the market and reward/protection for the innovation. The workshop was facilitated by Dr. Fulya Batur, associate research fellow at the Geneva Academy of International Humanitarian Law and Human Rights.

The expert workshop was organised as a part of a joint research project, “Farmers as Plant Breeders: Legal Mechanisms to Foster Farmers’ Innovation”, led by Prof. Christine Frison (Université Catholique de Louvain), Prof. Kim Van der Borght (Vrije Universiteit Brussel), and Prof. Carlos Correa (South Centre). The research project is funded by the Research Foundation Flanders (FWO).

Part I

Recognising farmers as breeders

Dr. Fulya Batur started the discussion with the question of who the farmer breeders are, what they develop and in what kind of legal landscape they operate. In the European Union (EU),

the definition of ‘farmers’ comes from common agricultural policy (CAP) strategic plans regulation, which defines farmers as a natural or legal person or group of natural or legal persons whose holding is in the EU and who exercise an agricultural activity as determined by Member States. The EU's definition of farmers differs from country to country as “agricultural activity” is defined by the Member States. The United Nations Declaration on the Rights of Peasants and Other People Working in Rural Areas (UNDROP), on the other hand, defines a ‘peasant’ as any person who engages or seeks to engage, alone or as a community, in small-scale agricultural production for subsistence and/or for the market, and who relies significantly on family or household labour and has a special dependency on and attachment to the land. These elements of UNDROP are not present in the definition of ‘farmer’ in the EU law. Instead, in terms of seed marketing law, regulations only define professional seed operators, putting farmers in the same box as seed operators.

Ms. Maria Carrascosa from Entretantos Foundation, Spain, suggested that before considering farmers as breeders, we should view “farmers as researchers”. They extensively research in different fields, including breeding, variety assessment, machinery, as well as marketing paths. In her opinion, farmers as researchers could be a boarder frame which would also include breeding. In agreement with Ms. Carrascosa, Dr. Batur suggested that “Farmer as innovator” could perhaps rightly capture the essence of farmers’ efforts, especially in the EU policy circles, where farmers are given a passive role of users of seeds. Prof. Graham Dufield from the University of Leeds, United Kingdom added that on-farm innovation should not be limited to developing new plant varieties. Such a definition is a narrow perspective on innovation done by farmers on farms. Confirming the need to take a holistic view of farmers’ innovation, Dr. Batur clarified that the discussion on the workshop agenda focused particularly on breeding innovations of farmers.

Mr. Frank Adams, Réseau Meuse-Rhin-Moselle (RMRM) explained the dichotomy of recognising farmers as breeders, saying, “If something is not defined, it cannot have rights and cannot be protected. But if something is defined, it can be controlled.” It can be rightly illustrated by the perception of artisanal seed producers (*artisans semenciers*) in France – while some of them express the need for professional training, some fear that being recognised as professionals leads to regulation and control. Thus, sometimes, it may not be clear among the farmers' network themselves which route to take. As such, Mr. Adams stressed the need for the farmers’ movements to clarify their own work and define the terminologies like plant breeding, farmer, and seed producers rather than relying solely on policymakers of the European Commission. Sharing the evolution of the definition of “*semence paysanne*”, which took many years, and over the years (in 1994, 2008 and 2018), the definition also changed without considering the views of farmers’ movements, he argued that such approach does not reflect the values or vision of the farming communities. It rather uses negative terms like ‘non-DUS variety’ or ‘heterogenous’ instead of positive terms like genetically diverse varieties.

Ms. Loes Mertens from Bio Wallonie opined that according to national laws, anybody can select, register, or maintain a variety. There is a long history of farmers’ breeding in the potato sector. And in Holland many farmers are the official selectors of potato varieties. Thus, in her opinion, there is no legal obstacle for farmers to have a recognition as breeders.

Mr. Antonio Onorati from the European Coordination Via Campesina (ECVC) shared his organisation's position: “Farmer breeders have the right to be breeders, but it is not to be linked with what we defend as farmers’ rights. This is just a section of small-scale seed industry, personal seed industry or farmers’ seed company. And the provisions of this are in the regular

legislation. We don't see any need for specific legislation. What is clear is that it has nothing to do with farmers' seed system." He further shared that the United Nations Food and Agriculture Organisation (UN FAO) has the concept of a farm seed company, which includes individual farmers as well. It is one of the ways for farmers who seek to involve in breeding and marketing of seeds. He expressed that ECVC supports the small-scale seed industry and small cooperatives that do such innovations, citing examples in Britain and France. However, in some instances, such as in Italian vineyards, horticulture variety producers operate as micro-enterprises, often with only one or two individuals behind them. And interestingly, some of these are even part of the Italian seed association along with the big companies. While Mr. Onorati believed there is no barrier to farmers' plant breeding and seed marketing in the existing legal framework, he conceded that passing through the regulations, including the plant health regulation and control, is practically difficult.

Prof. José Esquinas, former chair of the Ethics Committee of FAO, noted that the recognition of farmers as breeders is an obvious thing that must be done in one way or another. The International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA), as well as UNDROP recognises farmers' contributions to plant improvement. However, derivation of specific rights from such recognition and implementation of the rights has been challenging. Recounting a conversation between a seed corporation representative and an indigenous leader from Colombia, Prof. Esquinas highlighted the collective and incremental nature of farmers' innovation and their respect for the generations that preceded them. He stated that recognising any kind of property rights except the right "to use and continue doing what they are doing" would impose the Western mentality, which would ultimately destroy their culture.

Farmers do not care about the regulations

Dr. Véronique Chable from the French National Institute for Agriculture, Food, and Environment (INRAE), France, suggested not to include farmers' breeding activities in the regulatory system. She stated that in her experience, farmers do not care about the regulations, and the perception of farmers, for instance, in Brittany, is – we have to do what we have been doing whatever the regulation be. She stressed that the regulatory system is the result of interface between the industrial system that started in the middle of the last century and the continuity of farmers' activities with seeds. According to her, the legitimate system is the farmers' system, and the other system only arrived through the market. Dr. Chable further suggested that while discussing the legal aspect of farmers' seeds, we must also consider that there is a movement, a cultural dynamic that does not care about the regulation. The vocabulary in the regulation system does not represent the reality of farmers' seed system. A similar suggestion was forwarded by Prof. Mrinilani Kochupillai from the Technical University of Munich (TUM), Germany, based on her research in India. She stated that the farmers working with indigenous seeds do not care about national or international regulations. Unlike in Europe, there is no such extreme regulation of agriculture in India, and therefore, farmers' innovation has grown a lot. Farmers' varieties are recognised and protected in Indian plant variety protection (PVP) law, and the majority of applications and most popular innovations are from farmers. Similarly, there is also cultural dynamics regarding farmers' innovation in India that evolved with the agroecology movement of natural farming, leading to many cases of agrobiodiversity revival and raising peasant income. Interestingly, this is happening parallel to the expansion of intellectual property law in India. The farmers involved with agroecology do not care about intellectual property rights (IPRs) because their sphere of operation and innovation does not overlap with the formal system.

The same law cannot govern two different systems

Mr. Onorati emphasized that we must recognize the existence of two distinct seed systems, cautioning against any confusion between them, whether in regulatory matters or ideological framing. Since these two systems are different, he stressed that they need different legal frameworks. In Europe, there is a legal framework for seed marketing which is unsuitable for farmers' varieties. He said, "I cannot imagine what it means to recognise varieties of farmers' seed system in the legal framework of access to the seed market. What would it mean? Farmers work on population, dynamism, change and adaptation. It is an agricultural activity. And this is the main difference. We are not seed companies." He noted that while there is some recognition of farmers' seed system in international discussions, their struggles persist. Recently, there has been some recognition in the EU. The EU proposal on seed marketing (2023/0227) in Article 30 refers to the dynamic management of agrobiodiversity by farmers.

Prof. Dutfield expressed concern over such strict division of two systems, which is somewhat puzzling. He pointed out that even though one may want to follow nature, one may still wish occasionally to use some industrial products. He proposed that the reality could be a spectrum of hybrid systems rather than a strict division of two systems. Mr. Onorati responded that the product and purpose of the two systems are entirely different – one is the result of industrial activity, and the other is the result of the farmers' harvest. The governing legal framework, therefore, needs to be different. He also admitted that, particularly in the Global North, the industrial seed system holds significance for the peasant seed system because they are not able to produce what they need. Mr. Onorati suggested that the peasant seed system needs to be protected, supported and defended because it is under constant attack from the market power through patents, Digital Sequence Information, etc. Such elements limit the action, capacity and development of the peasant seed system.

Mr. Riccardo Bocci from Rete Semi Rurali, Italy, suggested that along with the concept of Farmers' Rights, it is also essential to understand the type of materials farmers work with. "Diversity is the key issue, and we have to understand how to deal with diversity", stressed Mr. Bocci. Concerning Indian legislation, Mr. Bocci opined that while the PVP legislation recognises farmers' right on their varieties, the right is still based on some uniformity requirement. They follow similar rules of PVP protection and are dealt by the same office, the protection of plant varieties and farmers' rights authority. He emphasized the need to discuss the policy not only concerning rights but also the fact that farmers work with diverse materials and their breeding activities are not about uniformity but diversity. This challenges the existing legal framework because diversity is entirely outside the IPR regimes. Mr. Bocci suggested the need for other ways to protect and promote farmers' innovation. He shared that his organisation has been using an open-source model to share and promote innovation. Agreeing with Mr. Bocci, Prof. Esquinas also highlighted the need to emphasize intra-varietal diversity, which allows farmers to adapt to unpredictable environmental changes, including climate change. He opined that such diversity has been making farmers autonomous for centuries by reducing dependency.

Prof. Kochupillai suggested isolating farmers' innovations with indigenous seeds from soil regulations is not possible. For farmers to innovate with truly indigenous seeds, the soil must be chemical-free. Unlike green revolution-engineered seeds, indigenous seeds do not withstand fertilizers. In a farmer survey in India, she observed that farmers who started using fertilizers extensively had to give up on their indigenous seeds because they progressively stopped yielding in fertilizer-rich soils. Currently, the indigenous methods of preserving seeds

and managing the soil are not welcome in Europe because of the fear of microbes. The farmers are not always able to distinguish between good and bad microbes as there is a loss of knowledge of maintaining soils in most of Europe because of soil and fertilizer regulations. Dr. Chable also added that it is essential to consider soil and seed together in a farming system. She further stated that the seeds of modern varieties from the commercial sector or breeder are not connected to the soil and cannot respond to soil microbes. Sharing her study on the interconnectedness of soil and seeds, she said, “We studied modern wheat and landraces. There are two kinds of behaviour. Landraces can exchange information with soil, but modern seeds cannot recognise good or bad microorganisms to evolve. So, they need the chemicals. Most often, the modern varieties are not connected to soil in the breeding process.” Thus, she suggested maintaining the two systems as farmers do not breed to introduce chemicals and pesticides, nor would they need to access commercial varieties in their breeding activities.

Part II

Access to the breeding material

The participants discussed different laws that affect farmers’ access to breeding material and what changes would facilitate such access. While UNDROP guarantees peasants’ rights to save, use, exchange and sell their farm-saved seed or propagating material (Art. 19(1)(d), UNDROP), different laws, including the intellectual property (IP) laws, seed marketing laws, access and benefit sharing regulation and even plant health regulations affect farmers’ access to breeding materials in one way or other. IP laws, namely patents and PVP, are the main hurdles to accessing breeding materials. Dr. Batur noted that one might think it is given that farmers are viewed as breeders, and they could use the breeders’ exemption, but for most actors in the mainstream International Union for the Protection of New Varieties of Plants (UPOV) system including the European Commission, it is not the case.

Access to public gene banks

Mr. Bocci stressed that it is crucial to have access to breeding materials from the public gene banks. It is a way to start new plant breeding programs and to have diversity in the field. The statistics of many public gene banks in Europe show increased demand from farmers, meaning farmers are asking to access more and more varieties from the gene banks. However, according to Mr. Bocci, public gene banks are currently in a crisis because they are not very relevant to the industrial systems. For around the last 15 years, private companies have their own collections stored in private gene banks, which are not in the public domain or the multilateral system.

Sharing the findings of a comparative study conducted last year and 20 years ago on how public gene banks are responding to farmers’ demands in Spain, Ms. Carrascosa shared that there has not been an increase in the capacity of the public gene banks to meet those demands. There are 27 public gene banks in Spain, and unlike before, their contacts are easily available online. Yet, the cases of public gene banks meeting the farmers’ demand has not increased, and only less than 50% of farmers’ demands is met. Furthermore, the germination rate of the gene banks supplied seed is often low. Public gene banks are facing a shortage of human resources with decreasing administration and field staff. She stated that the mindset of gene bank managers is conventional, and they view farmers’ networks as a competition. Ms. Carrascosa stressed the need for collaborations between farmers and the public gene banks. Mr. Bocci added that the public gene banks do not always possess the capacity and money to

multiply the accession they have. He shared that in Italy, his organisation made an agreement with public gene banks to help them multiply their accession. He said, “So they [public gene banks] give to us each year a set of accessions, to multiply, and if we have time and money, also to characterize [as well]. There are other examples of that in other European countries, mainly the Netherlands; they are doing the same with private breeders, who multiply for the gene banks. This is an issue that needs to be addressed.” Mr. Bocci further shared that another difficulty is that the public gene banks are not often able to respond to the request from a single farmer. They do not have the capacity to respond to, for instance, hundreds of individual requests. He suggested that such issue can be addressed by community seed banks, which can multiply the seed from gene banks and act as liaison between farmers and gene banks. This mechanism could even be proposed at the European level.

Mr. Bocci also shared an experience of difficulties in accessing material from the national gene bank in Italy. He said that it was not possible to access rice seeds from the Italian gene bank, and then they approached the International Rice Research Institute (IRRI) in the Philippines. And they could receive 250 Italian rice varieties by signing the Standard Material Transfer Agreement (SMTA). He stressed that the Treaty (ITPGRFA) is important because CGIAR centres conserve many materials, even from European countries, that could be relevant for them if national gene banks are not able to provide them.

Referring to the countries in Africa, Asia and Latin America, Mr. Nout van der Vaart from Oxfam Novib, the Netherlands, also pointed out farmers’ dire need to improve their access to public gene materials. Their recent webinar on the issue assessed that in many countries, there is a need to improve the farmers’ access to the materials, either held by the CGIAR gene banks or by the national gene banks. He suggested, however, that a first step would be raising awareness at the national level about the fact that there are public gene banks and that any farmer or farmer breeder can access those materials for their use. Prof. Kochupillai also mentioned that there is a movement towards community-held gene banks in India. And since many farmers are either illiterate or do not have electronic means to access national or international level gene banks, she suggested that this is a practical approach advanced by non-governmental organisations, especially those behind natural farming.

Dr. Batur pointed out that the EU proposal on seed marketing (Art. 29) seeks to regulate gene banks as professional operators by equating transfer to and from seed networks or community seed banks, farmers, or breeders as marketing. For seeds to be able to move from gene banks and seed conservation networks, they need to have a register with the description, be conserved, be free from pests, etc., and have to notify the quantities. She added that the proposal takes in a whole range of material transfers that were happening outside of seed marketing and puts it in seed marketing legislation as a derogation. She opined that this is not supposed to be regulated, and such regulation goes completely contrary to the idea of cooperation and access from gene banks suggested by the participants.

Access to commercial varieties

Another question that the experts discussed was whether farmers’ innovation needs access to commercial varieties for further breeding. Dr. Chable advised keeping farmers’ breeding separate from commercial breeding. She said that the commercial varieties which are bred in isolation from soil, do not communicate with the microbes of soil in the manner the local varieties do. Farmers do not breed to add chemicals and fertilizers, unlike commercial breeding, so these are better kept separate. Prof. Kochupillai shared that while some farmers in

India have occasionally used existing hybrid seeds, which are protected by PVP, to create their own varieties, there is another section of farmers doing agroecology who do not need such materials at all. Besides, the farmers in India do not even check for the PVP because their starting materials are so “heterogenous” that they are unprotectable. Notably, she shared that farmers in India reported that it is easier to innovate with heterogenous material because of the broad gene pool unlike in the commercial varieties where the gene pool is so narrow that the possibility of downstream innovation is also significantly narrowed.

However, Mr. van der Vaart suggested that the commercial varieties may possess certain traits that could be of farmers’ interest or need, thereby widening the range of options available for them. There are even occasions, for instance, in the Philippines, where the farmers successfully crossed a trait from a commercial genetically modified (GM) maize variety with a popular local variety. Thus, he suggested that accessing commercial varieties for further breeding by farmers might not be extremely necessary, but they could still be useful.

Referring to the situation of Europe in general and Belgium in particular, Ms. Mertens suggested that in some countries, commercial varieties are essential for further breeding by farmers because there are almost no other materials available. While there might be some personal collections of non-commercial varieties by a small group of collectors, it is a very small quantity compared to the genetic materials available in commercial varieties. In agreement with the point, Mr. Benoit Delpuech from Anthésis, Belgium, stated that in these situations, some small companies, like his, are playing the role of seed banks by making available materials. While the commercial varieties could be the last thing that farmers would look for in their innovation, it could also be the only available material to start with. Thus, Dr. Batur suggested that carving out ways in IP laws to facilitate farmers’ access to commercial varieties for breeding would work as a security blanket should there be a need to access such materials. Furthermore, she added that the farmers’ need to access other farmers’ varieties for breeding purposes could also be a strong reason to put more flexibility in seed marketing laws by facilitating farmers’ varieties to enter the market and excluding their exchange of seeds from the definition of ‘marketing’.

Mr. van der Vaart shared that most farmer communities with whom they work use whatever varieties they get, including PVP-protected varieties. Thus, he suggested that the IPR issue with regard to the UPOV Convention and the domestication of PVP laws under the Convention is very important to farmers. He further added that currently there is a limited exemption under UPOV regarding the use of protected seeds for private and non-commercial purposes. If the interpretation of the exemption can be broadened, it would benefit farmers for accessing a broader array of breeding materials. His organisation Oxfam Novib has been working with the Dutch Association of Plant Breeders and Euroseeds, asking UPOV to adopt a slightly more relaxed view on farmers’ use of protected seeds for private purposes.

Mr. Delpuech shared that even the plant health legislation affects access to the breeding material. In the EU, the phytosanitary measures might block access to breeding material because whatever is collected from gene banks, other farmers or small companies that come without the plant passport, farmers don't know how to integrate it into their own traceability system, which needs to be maintained according to the plant health legislation. There is a research exception in the plant health legislation when you can import without the certificate. However, it is unclear to what extent this exception provides leeway for farmers and the gene banks.

Part III

Access to market

UNDROP obliges states to “ensure that seed policies, plant variety protection and other intellectual property laws, certification schemes and seed marketing laws respect and take into account the rights, needs and realities of peasants and other people working in rural areas” (Art. 19(8)). However, when it comes to market access, the EU prioritises two aspects: risk prevention and seed marketing. Strict risk prevention in the EU requires compliance with the plant health regulations, mandatory registration of every operator, traceability and record keeping and annual control. Similarly, seed marketing legislation is based on two pillars, namely, (i) premarketing registration of a variety based on distinctness, uniformity, stability (DUS) and value for cultivation and use (VCU), and (ii) certification of the seed lots of the varieties. There are some derogations that farmers could use to register their varieties. Farmers may register their varieties either as “conservation varieties”, “amateur varieties”, or “Organic Heterogenous Material (OHM)”, which provides some gateway to register farmers’ varieties in Europe. Mr. Corentin Hacquet from Réseau Meuse-Rhin-Moselle, Belgium shared concerns about farmer space being limited to derogations in the seed marketing laws.

The EU proposal (2023/0227) on seed marketing

Dr Batur shared the changes proposed by the EU proposal on seed marketing regulation. Instead of VCU, the new proposal brings the concept of value for sustainable cultivation and use (VSCU), which takes into account the performance of a variety along with its sustainability. However, sustainability is determined only based on traits like disease resistance, less water requirement, etc. Mr. Bocci suggested that while using the term sustainable might appear nice, the idea of sustainability here is limited to varieties with genes resistant to different pests. Thus, the purpose is to create a market for such varieties that are tested and contain genes of resistance, making it difficult to put on the market the varieties that do not contain such genes. Agreeing with Mr. Bocci, Ms. Carrascosa expressed concern over the concept of sustainability being limited at variety level and not considering the process of farm management, production, and transfer. The proposal requires supplier, producer, maintainer, and all other actors involved to be registered as professional operators. Dr. Batur opined that such a provision, requiring not just the supplier but anyone who touches the seed at some stage to be registered as a professional operator, is disproportionate.

However, some positive changes have been proposed in the regime of conservation varieties. It is no longer linked to genetic erosion and there is no quantity or geographic limit. Besides, the proposal opens the registration of conservation varieties to all the species, unlike the current regulation, which allows it only for agricultural crops and vegetables. However, Dr. Batur suggested that one issue in the proposed regulation on the conservation varieties is the requirement of a high level of genetic heterogeneity, which might act as a barrier to accessing the market since such heterogeneity is not always present in all the landraces. Mr. Bocci welcomed the inclusion of newly bred varieties in the conservation varieties, which he hopes will be a gateway for registration of farmers’ varieties, including those resulting from participatory plant breeding.

Similarly, the proposal also extends to the sale of heterogeneous material to non-organic conditions. If the conservation varieties and the extension of organic heterogenous materials to non-organic, both require high degree of genetic heterogeneity as the only description, it is

difficult to differentiate them. Mr. Bocci informed that his organisation, along with other partners, are trying to provide a better definition of conservation varieties to avoid overlap with the heterogenous material.

Furthermore, the proposal contains an exception to the requirement of variety registration and seed lot certification for the sale of seeds to final users. However, all relevant data must still be submitted to the respective authority. Mr. Bocci stated that there are various derogations within the seed marketing rules in Europe, namely with regards to registration, certification and in relation to uniformity requirements. He suggested that there is room for improvement and that completely disregarding the existing regulations is not an option, as small changes are also significant in opening diverse spaces in the legal framework.

Part IV

Recognition & reward

UNDROP recognises the right of peasants to maintain, control, protect and develop their own seeds and traditional knowledge (Art. 19(2)). It also guarantees the right to the protection of traditional knowledge relevant to plant genetic resources for food and agriculture and the right to equitably participate in sharing the benefits arising from its utilization (Art. 19(1)(a), (b)). It obliges states to take measures to ensure the agricultural research and development integrates the needs of peasants and to ensure their active participation in agricultural research (Art. 19(7)).

The participants discussed the suitability of existing mechanisms to reward the farmers based on environment laws, Access and Benefit Sharing laws, and those based on market tools, namely, IPRs. IPRs are considered not suitable for farmers' innovation due to the heterogenous nature of their materials. However, most participants suggested a defensive protection against the misappropriation of farmers' varieties.

Prof. Dutfield noted the lack of new ideas in relation to rewarding farmers' innovation, and sometimes, old ideas get dressed up as new ones. The recent concept of stewardship is also not a novel idea. He proposed that, although 'farmers as stewards' sounds good, it can be paternalistic to give roles to them without their permission.

The participants also discussed the suitability of the Open Source Seeds Initiative (OSSI) model for the protection of farmers' variety. Dr. Batur explained that OSSI can take the form of a pledge, as in the United States, where one can put conditions of not using IP and keeping in open source on the improvements based on the seed while providing the seeds. Prof. Dutfield suggested that it is a difficult analogy because with software, there is copyright which can be deployed to ensure that someone does not violate the agreement. But in case of seeds, there is no established legal right to stop people if they violate the rules. Although OSSI does not have automatic rights like the copyrights, in Germany, for instance, Agrecol uses civil contract law to bind into maintaining resource into the open source. Mr. Bocci mentioned that his organisation, Rete Semi Rurali, is a partner of Global OSSI (GOSSI), an informal network of organisations working with different approaches to promote OSSI. He shared that in the US, they work mainly with pledges; in Germany, they have a legally binding license; and in Argentina, under the concept of bioleft, they have developed three different kinds of legally binding licenses. Mr. Bocci noted that there are many ways OSSI can operate, but it is important to note that they are all questioning the IPR system. However, Mr. Bocci conceded that the

problem of financing farmers' innovation is still not solved, even with OSSSI. Furthermore, he said that one tricky issue with OSSSI is that the license can also be a means to impose more restrictions on the use of the materials than the law provides. They are experimenting to find ways in the GOSSSI network to address such issues.

The participants brainstormed on the financing initiatives by different farmers' networks and organisations. For instance, the UK Grain Lab connects farmers to bakers and has a levy system on the sale of each bread, which goes back to the farmers. Réseau Meuse-Rhin-Moselle in Belgium also connects farmers directly to the mills and bakers. Prof. Kochupillai shared that she has been exploring a blockchain-based solution to support farmers' innovation. Based on an assessment of the needs and challenges of farmers innovating with indigenous organic seeds in India, she suggested that features of blockchain technology can be used for creating a traceability system which can assist in terms of recognition or reward. Blockchain is already being used for supply chain tracing. These features can be used for innovation chain tracing, allowing a decentralized system rather than a centralized system with bureaucratic red tape.

Mr. Adams proposed that in the long run, financing farmers' innovation in the EU must be done through public money based on policies like the Green Deal, biodiversity strategy or farm-to-fork strategy. He said, "They mention locally adapted varieties, but when you work with locally adapted varieties which are traditional varieties, you cannot really live with it. This is why, I am teaching at school, so I am financing my local seed project...I am serving the common good, so I think this should be rewarded." Furthermore, he shared that in his country, Luxembourg, there are farmers, 50% of whose revenue comes from government subsidies. These subsidies have led to Luxembourg's 100% self-sufficiency in meat and dairy products, which are also exported. Mr. Adams argued that these farmers are subsidized for producing something that may not be needed. And on the contrary, other farmers who preserve diversity and whose role can never be replaced by industry are not subsidized at all, although we talk about sustainability. In agreement with Mr. Adams, Prof. Dutfield noted that the small-scale farmers around the world who are struggling to make a living do not get any help at all. And it is ultimately about our choices, whether governments choose to subsidize a company to locate a car factory in a city or have different kinds of schemes in the name of job creation or provide assistance to the farmers.

Prof. Esquinas reminded that in 1991, the Resolution (3/91) annexed to the International Undertaking on Plant Genetic Resources sought to implement Farmers' Rights through an international fund for plant genetic resources. The fund was voluntary and received money from different international artists, musicians, etc. Prof. Esquinas noted that although there was not much money, it was enough to show that such a mechanism was possible. While some European parliamentarians volunteered money for the fund, the European countries did not, and ultimately the fund could not materialize. He said that even the conservative economists concluded that a mandatory fund was necessary, but it could not be possible due to the unwillingness of the developed countries. Prof. Esquinas suggested that some elements of traditional practices could provide a reference to devise a reward mechanism for farmers' innovation. He shared about a kind of annual biodiversity fair connected to Pachamama (mother earth) in Yunga, Bolivia, where farmers and indigenous people bring something new they have developed or come across, which would usually be plants/seeds with special characteristics like better production, resistance, etc. or process or product derived from those plants. People in the fair would select a winner, who would have respect from the community for the full year until the next fair would take place. They would offer the seeds/fruits to mother

earth and distribute them to all people on one important condition: that they would never substitute their local varieties/plants with these newly received seeds, but only mix it with their local varieties. That, he suggests, is breeding and conservation at the same time. Similar kinds of fairs are taking place even in Europe, although no such winner is selected. He suggested that we can draw inspiration from such fair in Bolivia, select a winner who would be recognised and respected and also perhaps provide some monetary reward. He suggested that the FAO or the Convention on Biological Diversity could use diverse finance mechanisms to prioritize such innovation.

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