Chapter VIII : Policy incentives and disincentives for inclusion of material in the MLS

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Key messages

- Relevant policies and legal and institutional frameworks provide limited incentives for the conservation, exchange, value addition, and wider use of agricultural plant genetic resources (PGRs).
- Biopiracy of PGRs, traditional knowledge, and the perceived absence of mechanisms for benefit sharing are disincentives for researchers, farmers, and private-sector organizations to share PGRs under the Multilateral System (MLS).
- The main incentives for sharing PGRs are secure ownership rights and recognition that the shared material is used for national and global food security.
- Most of the breeders, researchers, farmers, and policymakers we surveyed are not aware of ITPGRFA and MLS provisions concerning incentives and disincentives for providing their materials under the MLS.

Incentives have long been used by governments to manipulate macro and sectoral economies. The aim of establishing both economic and non-economic incentives for biodiversity conservation is to influence people's desire and behaviour to conserve — rather than degrade or deplete — biodiversity in the course of their economic activities. Incentives modify the structure and effects of household utility function and give people the opportunity to choose the best option for them.

Scientists and practitioners began to promote biodiversity conservation after the historic summit that produced the Convention on Biological Diversity (CBD) in 1992. Article 11 of the CBD stipulates that "Each Contracting Party shall, as far as possible and as appropriate, adopt economically and socially sound measures that act as incentives for the conservation and

sustainable use of components of biological diversity" (United Nations 1992). The multilateral system (MLS) of the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA) can be implemented only if national governments, international organizations, and individual users of plant genetic resources (PGRs) for food and agriculture worldwide embrace its collaborative spirit and approach to PGR conservation and use as an international effort (Lopez-Noriega et al. 2012). Article 11.2 of the ITPGRFA states that parties agree to invite and encourage holders of the 35 crops and 29 forage species listed in Annex I to include them in the MLS to facilitate their exchange (FAO 2004).

According to the ITPGRFA, the PGRs of the 64 species listed in Annex I that are "under the management and control" of the national government and "in the public domain" are automatically included in the MLS (Halewood et al. 2013). However, for PGRs that fall outside these criteria, ITPGRFA member states agree to encourage "natural and legal persons" (companies, individuals, groups with legally recognized collective identities) to voluntarily include them in the MLS.

In reality, it is unlikely that people will share their PGRs and associated knowledge until they see some form of monetary or non-monetary incentives or direct or indirect benefits. Thus, it is important to understand what incentives are in place and the perceptions of various stakeholders about these incentives and whether they may be motivated to participate in the MLS and voluntarily include PGRs in the MLS. Such information is scanty in Nepal.

It is generally believed that, in rural areas, biological and genetic resources flow between villages according to social custom and through social connections or networks (Subedi et al. 2003) with the help of social capital (Pretty and Smith 2004). In a study to test this hypothesis, Pant (2007) found that 25% of farmers had sent biological and genetic resources to other areas or villages in 2006.

However, policies and incentives that affect the flow, use, and exchange of PGRs under the MLS have not received the same level of attention from national and international decision-makers, despite the fact that those policies affect agricultural and economic development. Thus, we undertook to analyze current incentives and disincentives; identify key policy options to create incentives so that disincentives and factors hindering voluntary inclusion in MLS are eliminated; and provide useful insights and suggest mechanisms and strategies to encourage voluntary inclusion of PGRs in the MLS.

The concept of incentives and disincentives

Incentives and policies influence the exchange, flow, use, and inclusion of PGRs voluntarily at the international, national, and local levels. International policies, agreements, and legal frameworks guide the development and enforcement of policies and laws at the national level. National policies and laws have a direct impact through related product and input markets, prices, information, and regulations. Regulations under national laws can facilitate or impose restrictions on the access, use, and exchange of PGRs in communities, regions, and beyond national boundaries. National policies (property rights, trade, investment, fiscal, monetary, etc.), as well as sectoral policies (on the environment, forestry, agriculture, commerce, and education), also create incentives and disincentives for the inclusion and use of PGRs (Gauchan

et al. 2003, 2005). Similarly, local informal institutions, such as traditional rules, norms, and common and customary practices, may also create incentives or disincentives.

Incentives for inclusion of PGRs in the MLS are mainly of three types: direct, indirect, and perverse incentives (Figure 8.1). Direct incentives include cash and in-kind inducements provided by the state, whereas indirect incentives are sociocultural, market, fiscal, and administrative factors influencing farmers' and stakeholders' choices. Perverse incentives are subsidies and compensation for cultivation and commercialization of high-yielding modern seed varieties that negatively affect the conservation, use, and inclusion of indigenous PGRs in the MLS. In this study, we focus mainly on direct and indirect incentives.

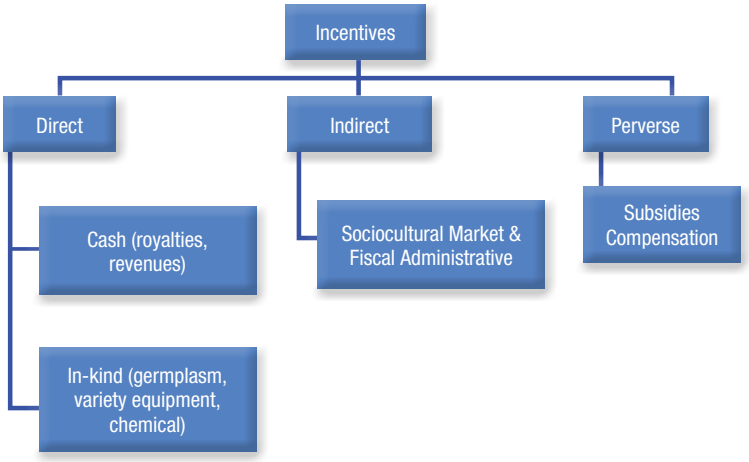

Figure 8.1. Types of incentives for including genetic resources in the multilateral system.

Methods

In this study, we carried out a literature review and held consultation meetings and field surveys of selected key stakeholders of PGRs. First, relevant international and national policy and legal documents that create incentives and disincentives were reviewed to study how such mechanism influence the flow, exchange, use, and voluntarily inclusion of PGRs in the MLS.

An exploratory survey was carried out with key representatives of plant breeders and researchers in the Agricultural Botany Division of the Nepal Agricultural Research Council (NARC); the National Rice Research Program (NRRP), Hardinath, Dhanusha; the National Wheat Research Program (NWRP), Bhairahawa; and the National Maize Research Program (NMRP), Rampur Chitwan. In addition, seed specialists and planners from the Seed Quality Control Centre, the Ministry of Agricultural Development, and the Seed Science and Technology Division of NARC were consulted.

At the community and farm level, community seed bank (CSB) managers; community-based seed producer groups; users of seeds, mainly farmers at Kachorwa, Bara, and Dalchowki, Lalitpur; and representatives of CSB leaders from Dhading and Sindhuplanchowk were interviewed to gather their perceptions on incentives and disincentives and factors that

promote or hinder the voluntary inclusion of material in the MLS. The survey of farmers and CSB managers aimed to understand and document local practices, norms, and customs influencing germplasm flow and inclusions. Complementary collection of information was carried out with selected plant breeders and researchers, using focused checklists based on the prioritized list of PGRs.

Information on incentives and disincentives was analyzed, synthesized, and documented. Stakeholder consultations at the national level in Kathmandu and at the regional level (e.g., NMRP, Rampur) were used to obtain input and feedback on the survey findings, which were then incorporated into the draft report.

Incentives and disincentives for sharing PGRs under the MLS

Several ITPGRFA member countries are still in the process of making decisions regarding the allocation of their PGRs under the MLS. According to Vernooy et al. (2013), to date, there is little information in members' reports to the ITPGRFA governing body about material that has been voluntarily included in the MLS; only six countries, France, Germany, Netherlands, Peru, Switzerland, and the United Kingdom, have provided such details. There is also little information about the measures that member states are taking to encourage such inclusion (**Table** 8.1).

Table 8.1. Incentives and disincentives for countries to include plant genetic resources (PGRs) in the multilateral system (MLS)

Incentives	Disincentives
• Displays altruism by helping the global community ensure food security • Increases the possibility of benefiting from technology transfer associated with the PGRs • Helps conserve genetic resources by creating a global backup • Enhances the reputation of countries that contribute significantly to the MLS • Increases moral pressure on other member countries to increase their contribution • Creates satisfaction from contributing to the work of fellow breeders all over the world and allowing them to breed better varieties	• Loss of national control over genetic resources • Resources become pubic and can be used even by non-contributors and small contributors • Liability attached to providing related information • Putting superior genetic resources into the MLS may hurt export interests of the contributing country • Erodes negotiating power of the country in future exchanges of PGRs that are not put under the MLS by other countries • Feeling of let others go first in sharing PGRs • Poor understanding of the importance of the MLS in increasing food production for the growing world population • Countries with superior PGRs gain less from sharing with those with fewer and lower-quality PGRs

The real custodians of PGRs for food and agriculture are the farming communities. Some such communities have formed CSBs to protect genetic resource that are under threat from agricultural modernization. Farming communities and their committees governing CSBs may have several incentives and disincentives for sharing their PGRs under the MLS (**Table** 8.2). See also chapter 6.

Table 8.2. Incentives and disincentives for community seed banks to include plant genetic resources (PGRs) in the multilateral system (MLS)

Incentives	Disincentives
• Altruistic feeling from helping farmers in other parts of the world • Chance to obtain advanced materials or developed and released seeds for ready use • Opportunity to receive technology related to varieties • Feeling of comfort knowing their resources are safe and can be retrieved in time of need • Recognition as a donor of PGRs to the MLS • Opportunities to receive materials from the MLS in exchange for their contribution, thus increasing options for future breeding • Material (quality seeds) and non-material (subsidies) benefits through working with the national authority for MLS implementation	• Fear that their PGRs will be exploited by others for commercial purposes • Failure to understand the importance of the MLS • Fear that sharing materials in the MLS may require surrendering their traditional knowledge about the resources • Sharing superior genetic resources can increase competition in the market and reduce the price of their products • Sharing superior PGRs can decrease their value • Temptation to share low-quality local landraces and retain superior materials for their own future use • Reliance on the global gene pool may reduce motivation to invest financial and human resources in conservation of PGRs • Fear of losing their uniqueness (e.g., unique variety)

Incentives and disincentives in key policies

Currently, there are no clear, well-defined policies or regulations that provide incentives for the voluntary inclusion of materials in the MLS in Nepal. However, some key existing policies have directly or indirectly created incentives or disincentives for the exchange of PGRs. Some of these are highlighted below.

Seed policy

The current seed policy and legislation provide incentives for putting improved crop varieties and released and registered landraces that are already in public domain into the MLS. Once a landrace is released or registered, it is considered a public good; it comes under the management and control of the national government and its genetic materials are freely sold and exchanged without restriction. However, registration of a few landraces has only recently been initiated with the National Seed Board despite the increasing trend to register hybrid varieties by the private sector.

In the last 4 years, the registration of hybrids has increased significantly following a favourable shift in policy (2008 amendment of the Seed Act 1988) (MoAD 2008). So far, 245 exotic hybrid vegetables and 17 rice and 35 maize hybrids have been registered (MoAD 2013). This trend in registration of hybrids is a result of incentives available to the private sector, which perceives great benefits from the hybrid seed business. In addition, plant breeders and other scientists in the public sector receive better recognition (officially or from their peers), rewards, international links, and academic career advancement if their improved varieties and hybrids are tested, released, and registered.

In contrast, farmers and other plant breeders do not have clear incentives to register and release local landraces. Even though legislation has made it easier to register landraces, stakeholders see no commercial benefit from doing so because of their low yields, lack of uniformity, and

low market demand except for few high-quality varieties, such as Basmati rice. Hence, there are limited incentives for farmers, community seed bank groups, and private companies to put their landraces and traditional PGRs into MLS through the registration and release process. Moreover, the current Seed Act has the provision for stakeholders to obtain breeders' or ownership rights for improved varieties. Therefore, as a rule, unless ownership rights and recognition are given, individuals have no incentive to share PGRs voluntarily in the MLS.

Plant variety protection and farmers' rights

The draft Plant Variety Protection and Farmers' Rights Bill (MoAD 2005) does not recognize or include provisions for Annex I crop species. It awards ownership rights to farmers for their local varieties as well as new plant varieties (farmers can claim intellectual property rights and act as breeders); hence, if anyone wants to access and share PGRs, prior informed consent must be obtained. However, breeders' rights to new varieties are not applicable for private, non-commercial uses, study, academic and research purposes, and breeding and development of new varieties. Hence, the breeders' exemption clause could be used to motivate breeders to voluntary include PGRs in the MLS. Individuals and institutions also have the right to transfer or sell such rights for a specified period.

Agro-biodiversity Policy 2007

The original Agro-biodiversity Policy (2007) had no provision for sharing genetic resources voluntarily in the MLS, as it had not been harmonized or formulated in the context of the ITPGRFA. However, it has recently been revised and provisions for the MLS included. The policy now includes:

- Provisions for facilitating two-way access and sharing of PGRs as per provisions of the ITPGRFA.
- Provision of a designated authority to facilitate inclusion in the MLS (discussions are underway among stakeholders).
- Strengthening the national genebank and provision of links with CSBs to facilitate access to and exchange of PGRs.
- Provision for prior informed consent in the form of a Standard Material Transfer Agreement (SMTA) from farmers and communities holding PGRs required by international institutions (provides room for negotiating incentives or benefits).

However, the revised Agro-biodiversity Policy makes no explicit mention of provisions and mechanisms for encouraging individuals to put their PGRs into the MLS as envisaged by ITPGFRA Article 11.2 (FAO 2004).

Perceptions of community seed bank managers and farmers

Although there are about 115 CSBs in Nepal, few of them are strictly conservation oriented (Joshi 2013). A survey of conservation-focused CSB managers and farmers revealed that they are not very aware of ITPGRFA and MLS provisions, including incentives and disincentives to put their material into the MLS.

Views of knowledgeable CSB managers and members

CSB managers who are more aware of the importance of local genetic resources feel that the landraces and other farmers' varieties that are being conserved and used in the local community should not be shared with national and international organizations without their prior consent. Ownership and recognition of their genetic materials should be provided if they are shared with other organizations and outside the country. For sharing with the national gene bank, managers need some form of evidence that their material is stored, such as a certificate of deposit, and a guarantee that the material can only be shared with prior consent and due recognition.

However, increased awareness of the creation and exchange of genetic resources among the national gene bank, international agricultural research centres, and communities might increase confidence and encourage communities to share their local genetic resources under the MLS. This may be possible only after developing trust and collaborative relations with R&D programs, as evident from the current field studies conducted in local CSBs in Kachorwa, Bara, and Dalchowki, Lalitpur. A national workshop held in 2013, in which CSB members discussed various management and policy-related issues, including the sharing of PGRs, also revealed that farmers seem willing to share their materials provided they also receive a fair share of benefits and their roles are properly recognized.

Views of general farmers outside the CSB system

Many subsistence farmers outside the CSB areas and on-farm conservation project areas did not object to their seed materials being freely shared with outsiders in small amounts. Many of these farmers have been exchanging and sharing small quantities of seeds over generations, whenever outsiders request them. Indeed, they feel honoured to be able to exchange their local seed materials and other genetic resources with outsiders. This practice occurs in many remote rural areas where farmers lack awareness, knowledge, and information about their rights to genetic resources. As a result, biopiracy is increasing.

Biopiracy is the use or appropriation of genetic resources without the necessary access permits or fulfilling agreed conditions and is, therefore, illicit (Biber-Klemm and Martinez 2006). Biopiracy has also been defined as the use of intellectual property laws (patents, plant breeders' rights) to gain exclusive ownership and control of biological resources and knowledge, without recognition, reward, or protection to informal innovators (RAFI 1996).

Farmers face a tradeoff between compromising food production by restricting the flow of genetic resources and risking biopiracy by allowing freer movement (Pant 2007). Adequate legal provisions and implementation mechanisms are required to increase the flow and use of genetic resources and reduce the chances of their misappropriation for commercial purposes.

Perceptions of plant breeders and researchers

Many of the plant breeders and researchers we consulted had little knowledge and awareness of the ITPGRFA and the provisions of the MLS. They have some knowledge of intellectual property rights and SMTA, but not of the specific provisions of facilitated access under the

MLS and ITPGRFA. Plant breeders and researchers are willing to share their own released and registered varieties voluntarily in the MLS. However, they are not willing to share the materials they are in the process of breeding and developing.

Breeders and researchers are very cautious about sharing pre-breeding materials and landraces, especially with private seed companies and especially multinational ones. In sharing material under development, they want to secure ownership rights and recognition of their work. International links, exposure visits, and increased capacity building among young researchers provide some incentives for sharing and exchange of genetic resources for the global benefit. Many plant breeders and researchers feel that some form of royalties is needed to encourage them to develop, exchange, and share their genetic resources with other researchers within the country and around the globe.

Increased biopiracy of genetic resources and traditional knowledge and the possible lack of fair and equitable benefit-sharing due to inadequate information and lack of well-documented traits-related information on PGRs are perceived as disincentives for researchers and plant breeders to share PGRs under the MLS. In some cases, lack of financial and human resources and poorly coordinated institutional mechanisms have also been disincentives for plant breeders to deposit material with the MLS.

Assured access to important germplasm from the MLS and to the international system is a motivation for breeders in both public and private sectors to share their genetic resources, expertise, skills, and time. They see this leading to greater opportunities to develop varieties that are adapted to various production environments, including adverse environments. As many plant breeders and researchers have poor knowledge and awareness of ITPGRFA and MLS provisions and the importance of facilitated access and exchange to national and global food security, more information on the MLS and its benefits may provide incentives to breeders and communities.

Conclusions

Providing evidence of ownership of PGRs and recognition in the form of acknowledgement and certificates of deposition of shared material, as well as some form of benefit (e.g., exchange of materials) are important incentives for stakeholders to share materials through the MLS.

Lack of awareness of the importance of the MLS in maintaining national food security is the greatest disincentive to individuals voluntarily sharing PGRs through the MLS. Improved understanding and awareness of the role of MLS in national and global food security among policymakers, plant breeders, research and development professionals, farmers, and local communities is, therefore, essential to initiate and accelerate the process of voluntary inclusion of PGRs.

Under the ITPGRFA, member states agree to encourage "natural and legal persons" (companies, individuals, groups with legally recognized collective identities) to voluntarily include PGRs of the 64 crops and forage species listed in Annex I in the MLS. In this context, the Government of Nepal can consider mechanisms to encourage this practice, for example by requiring recipients of public funding for research to make their PGRs available through the MLS.

Equally important is the need to consider the means by which materials can be voluntarily included and made available. For example, the national genebank could accept deposits of PGRs that a CSB, company, or individual wishes to make voluntarily and, subsequently, make them available under the SMTA. Alternatively, those companies, individuals, and communities could be allowed to provide the materials directly using the SMTA, by developing special mechanisms and incentives to encourage and allow voluntary inclusion of PGRs in the MLS. This will require the development and implementation of adequate incentives and benefits through policy, legislation, and programs.

The following key policies and incentives might encourage communities and countries to participate in the MLS.

- Recognize donors and provide evidence of the deposition of PGRs in the MLS, even those that are not commercialized. Pedigree records and other documents can help trace the initial contributors.
- Ensure clear mechanisms for sharing benefits from the commercial use of PGRs provided by any country or community. Technological advancements, such as DNA fingerprinting, are necessary to trace the flow of genetic resources put into the MLS to ensure that they are not used for commercial purposes without sharing the benefits.
- Ensure providers of PGRs that the resources they share through the MLS will not be misused, and develop and revise legislation to protect the rights of the donor against misuse of their resources. The MLS should ensure that PGRs in the MLS will be used only for food security and not for trade interests.
- Develop a reporting system so that donors of PGRs are regularly informed and updated about the use and further development of the PGRs they provide.
- Educate custodians of the resources that their work contributes to food security of people all over the world.
- Develop national legislation that provides custodian farmers and other owners and donors with rights over their PGRs so that they have authority to provide PGRs to the MLS and negotiate benefit-sharing.

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