Case study 9: Plant Variety Licensing to Enhance African Seed Systems

Component: Seed Marketing and Distribution

Subtitle: Licensing of Plant Varieties

Executive Summary: Variety licensing is a tool for plant breeding companies and institutions to commercialize their varieties and to transfer technology to farmers efficiently. Licensing allows for the transfer of technology from the inventor to the user, while still maintaining control of how the variety is used. The rationales of licensing are:

- Transfer seed technology and increase opportunities for commercialization,
- Improve farmer access to diverse, high quality seed varieties,
- Allow variety owners the option to try new geographical markets with relatively,
- Low upfront risk, and
- Provide possible source of funding for public research institutions.

As the seed industry becomes increasingly privatized, interest in licensing new varieties, both from national and international sources, is likely to increase. Likewise, financial pressure on public sector breeding will increase the need for the targeted commercialization of varieties throughout-licensing.
The issues that constitute the spirit of a license and set the foundation for good cooperation include: 1) license type/exclusivity, 2) territory/scope, 3) evaluation of the local adaptation of the varieties, 4) germplasm protection, 5) plant breeder's rights and official variety registration, 6) compensation/royalties, 7) effect of termination, and 8) sublicensing/reporting to licensor.
African countries have what it takes to support variety licensing with the great benefits it brings to both licensors and licensees.
Vegetable crop breeders developed the "International Licensing Platform Vegetable ("ILP") in 2014 with the main objective to enable worldwide access to biological material covered by patents for the purpose of vegetable breeding, whilst safeguarding incentives to invest in patentable inventions. The ILP may potentially serve as a prototype for multiparty licensing structures in group of crops including root and tuber crops, grain legumes, cereals among others.
A case study of a non-exclusive license between KALRO and Kisima Farms in Kenya is presented here to learn lessons for other institutions and countries. The observations were that the license agreement was well-designed and can help public breeders and research institutions generate needed revenue through royalties, while expanding access to seed.
CESSA could also spearhead efforts to make the case for licensing in both the public and private sectors in African seed systems.

Context:
Plant variety licensing defined: Variety licensing is a tool for plant breeding companies and institutions to commercialize their varieties and to transfer technology to farmers efficiently (Nilsson, 2007). A plant variety licensing agreement is a contract between two entities, or "parties." Licensing allows for the transfer of technology from the inventor to the user, while still maintaining control of how the variety is used. Licensing is the most common vehicle by which intellectual property rights (IPRs) are transferred from inventors to users (Payumo, Grimes & Jones, 2012). However, license agreements are not the only contracts that a breeder may enter in relation to a protected variety. Other contracts may include material transfer

agreements in relation to accessing varietal material for research purposes, and seed production agreements where a breeder contracts a third-party in multiplication of seed (Munyi et al., 2018).

The rationale of licensing is:

1. Transfer seed technology and increase opportunities for commercialization
2. Improve farmer access to diverse, high-quality seed varieties
3. Allow variety owners the option to try new geographical markets with relatively low upfront risk
4. Provide possible sources of funding for public research institutions.

As the seed industry becomes increasingly privatized, interest in licensing new varieties, both from national and international sources, is likely to increase. Likewise, financial pressure on public sector breeding will increase the need for the targeted commercialization of varieties throughout-licensing.
As the seed sector becomes more transparent, the market should see more foreign investment from companies who wish to make their varieties available through licensing. This should promote local seed production and variety testing.

Development of the private seed sector will increase competition and could accelerate access to improved seed by the farming community. Small- and medium-sized seed companies need to develop their product portfolios through *in-licensing* of varieties. Public institutes could increase profitability by outlicensing their varieties. The privatization and increased transparency of the seed sector could promote foreign investment from companies wishing to make their varieties available through licensing, which in turn would promote local seed production and variety testing.

The following are some of the factors that affect licensing strategies (Munyi et al., 2018):

- General legal structure of the national plant breeder's rights system
- Policies attendant to the income for the breeder
- Type and market of crop, including the seed system operating
- Royalties' collection mechanisms potentially available to breeders.

Contractual Considerations

The specific terms, or parts, of the licensing agreement depend upon the international, regional, and national legal frameworks of the relevant country. The legal and regulatory framework informs the strategies the licensor/licensee chooses to protect the variety and governs in the event of a dispute or breach of rights.

Some countries in Africa follow a common law system and others follow the civil law system. Some common practices exist in both systems, like the need to agree upon and carefully define terms contained in the contract; this kind of information should be reflected in a licensing agreement, typically in the introductory section. A Key difference between the two systems is that a civil law system defines a greater number of contractual terms by law (contracts are shorter as a result), while common law systems allow more freedom for the contracting parties to define their own terms.

A variety license agreement can be divided into two main parts:

1) clauses describing the key rights and obligations of the parties and the conditions that make the framework of the license; these clauses will set the standards for cooperation and outline what the parties wish to achieve, and
2) clauses that are not specific to the agreement but are legally relevant; for example, processes for dealing with arbitration, relevant law, legality, assignability, warranty, and force majeure.

In-licensing

The most obvious reason for in-licensing varieties is to enhance or complete a company's variety portfolio. In-licensing gives breeding and seed companies access to new technology (like hybrid varieties); breeding companies may profit from this new technology without obtaining a license to use the hybrid system itself in variety development. In-licensing also avails the possibility for breeders to compare their material with that of their competitors in the early stages of variety development.

Out-licensing

The most common reason for a company to out-license its varieties is to maximize the return on its investment by allowing others to produce and sell its varieties in markets that the company cannot reach. Small- or medium-sized breeding companies, for example, may not have the resources to establish their own sales organization either within their own country or in different countries. Therefore, companies will use out-licensing to fully exploit the potential of their breeding program.

Plant Breeder Rights (PBR) and licensing

Plant Variety Protection (PVP) legislation that confers Plant Breeder's Rights (PBR) are necessary for licensing as they provide incentives to plant breeders for the development of new varieties of crops. This, in turn, fosters progress in sustainable agriculture and generally improves the economic circumstances of farmers and growers, since it gives them access to new and improved varieties. However, without the legal framework for acknowledging the ownership of the licensed varieties, the variety owner will have difficulty getting a return on investments made in variety development. Effective PVP legislation supports the interests of both the variety owner and the farmer. It will also facilitate the transfer of technology and provide incentives for further investments in the development of new plant varieties.

In many countries, PVP legislation is based on the International Union for the Protection of New Varieties of Plants (UPOV) Convention, which exists in three revised versions (adopted in 1961, 1978, and 1991). Major differences in the conventions will affect the approach to licensing. These differences include the species and genera for which PVP provides IP protection, exemptions from PBR (that is, the plant breeder's exemption and the farmers, or crop, exemption, also known as the "farmer's privilege"), the period of protection, and the scope of protection under PBR.

The farmer's privilege is an optional exemption from the PBR. It may limit the farmer's rights to use on-farm harvested material obtained from a protected variety on the same farmer's holdings as propagating material i.e., farm-saved seed (FSS).

The PVP legislation of the UPOV members is well documented and should not pose any large problems for prospective licensors and licensees. An awareness of the differences will facilitate the development of the variety license agreement. On the other hand, it may prove more difficult to influence PVP legislation in nonmember countries, and licensors are strongly advised to gather as much information as possible about the PVP system in a new territory so that they can adapt their licensing strategy accordingly.

Challenges and Objectives:
The technology embedded in the seed of a new variety is easily transferred to farmers on a large scale and can be used instantly. In many countries, public breeding has supplied varieties for use by seed producers and farmers at no cost. This free sharing of varieties makes it difficult to give recognition, in terms of royalty payments, for the variety improvement work (Nilsson, 2007).

Key issues in variety licensing
When establishing a license agreement, whether for in- or out-licensing, it is important to discuss and agree upon those issues that will constitute the spirit of the agreement and set the foundation for good cooperation. These include:

- Exclusivity
- Territory
- Evaluation of the local adaptation of the varieties
- Germplasm protection
- Plant breeder's rights and official variety registration
- Royalties
- Effect of termination
- Reporting to the licensor.

Interventions:
The issues that constitute the spirit of a license and set the foundation for good cooperation include: license type/exclusivity, territory/scope, evaluation of the local adaptation of the varieties, germplasm protection, plant breeder's rights and official variety registration, compensation/royalties, effect of termination, and sublicensing/reporting to licensor (Nilsson, 2007, Kuhlmann, 2019).

1. ***Exclusivity***

Nonexclusive licenses are rare, and experience has shown that breeders grant exclusive licenses more willingly than nonexclusive ones. Exclusive licenses are preferred because breeders believe that the mutual commitment will be stronger when working exclusively. A good variety provides a competitive advantage and will thus create revenue for the company with the exclusive rights. It is in the best interest of both parties to make the variety as profitable as possible, and the commitment resulting from exclusive rights is considered to lead to the best market coverage possible. Indeed, working on a nonexclusive basis is considered to have smaller market potential.
The exclusive rights granted to the licensee often correspond, either in part or in whole, to the rights that can be obtained through PBR protection for a variety. The licensee thus requires prior authorization from the breeder: production or reproduction (multiplication), conditioning for the purpose of propagation, offering for sale, selling or marketing, exporting, importing, and stocking for any of these purposes.
There are two major types of licenses. The first type is the **distribution license**, which includes the rights to market and sell the licensed material. The second is a **production license**, which in addition to these rights includes the rights to seed multiplication and production.
For varieties that are easily and rapidly multiplied, such as those of species with small seeds and low sowing rates, the licensor may prefer to keep all or most of the seed production within its own control. This would limit the exclusive rights for a distribution license. For varieties of species with high sowing rates and low multiplication factors (for example, beans), the transportation cost of the commercial seed to the licensee is likely to be high, and so a production license is usually preferred.
Breeders can partially preserve variety protection by limiting access to seed for propagating purposes. If the licensor allows only for marketing and sales, the variety is better protected because the licensor will not

have to leave out early generations of seed for multiplication from its internal control system. However, under certain circumstances, the final seed generation, or the commercial seed, may be more expensive because the total seed costs increase if the seed must be transported between countries or over long distances within the same country.

The number of generations of seed the licensee is allowed to multiply is also important. Generally, the number of generations is decided on a case-by-case basis rather than regulated through the license agreement. National legislation, as well as international rules and directions (such as the OECD Seed Schemes), should be consulted during licensing, since they regulate the number of generations that any seed may be reproduced (OECD, 2022). Because the reproduction system will influence the stability of a specific variety, the number of generations varies between cross-pollinated and self-pollinated species.

The rights of the licensee to hybrid varieties are most restricted to marketing and sales of the commercial seed. Hybrid seed production is more expensive and more complex than the production of line varieties.

The access to varieties a licensor is prepared to give a prospective licensee depends on such factors as earlier experience, market penetration ability, the licensee's existing variety portfolio, and ongoing cooperation with other breeders. Exclusivity to the licensor's material may be granted on different levels: single varieties (most common), selected crops/species (less common), and all crops/species (rare).

License agreements may regulate continued access to new varieties from the same licensor. Where the license agreement is limited to a single variety, it is likely that continued access would require a request from either party and could be part of the written agreement. For collaboration based on more-extensive variety trials, it would be sensible to settle an appropriate number of new breeding lines or varieties to submit each year to the licensee, subject to availability and request from either party.

2. *Territory/scope*

Territory defines the geographic area where the licensee has the right to exercise its exclusive rights. The territory is not necessarily restricted to a country; it could be a part of a country, one or more countries, continents, or even the world.

In variety licensing, however, the most common territory is that of a country. Depending on the market coverage capabilities of the licensee, it may also be suitable to instead define the territory as a group of countries or established unions, such as the European Union or the African Union.

3. *Evaluation of the local adaptation of the varieties*

The aim for both parties when in- and out-licensing varieties is to select varieties for marketing that show improved agricultural performance or have other desired characteristics. Apart from the market (end-user) demand, the value of a variety is ascribed to its adaptation to local growing conditions. Depending on the plant species, varieties can be transferred between geographic areas and climatic zones. Introducing new varieties usually requires the local confirmation of agricultural performance, which is done for the purpose of national listing and/or marketing advantages. Either the public system of variety testing, or private trials can be used to introduce the new variety.

The trial strategy and the minimum requirements for assessing local adaptation should be settled in the agreement, including any decisions about cost sharing. Commonly, the licensor will require the licensee to evaluate the value of the varieties in VCU (value for cultivation and use) trials at its own cost, with the aim of including them in the national list, recommended list, or any corresponding list of varieties officially registered for release in the territory. Private trials are also performed as a potential tool for the licensee to test varieties and select the best candidates for official trials.

4. *Germplasm protection*

It is important for a breeder to obtain protection for finished varieties and those still in trials. Due to the importance of protection, it is essential to include a section in the agreement outlining the handling and supervision of plant material before it has obtained PBR protection. It is advisable to restrict the licensee's distribution rights of the not yet-protected material to third parties and use of the germplasm to the licensee's own breeding programs. This restriction could either be part of the license agreement or part of a separate material transfer agreement.

5. ***Plant breeder's rights and official registration of varieties***

Plant variety protection (PVP) is important when granting access to new varieties. It provides protection of the proprietary rights of particular species in a territory. There is no blueprint solution for implementing PVP laws because the policies between countries differ greatly.

The PBR legislation in the defined territory will determine two matters: the strategy chosen by the licensor and the licensee to protect licensed varieties and what action to take if there is a breach of rights of the protected varieties.

The use of hybrid technology can provide additional IP protection in plants. This provides a self-regulating kind of protection for hybrid varieties and increases profitability for the licensee and the licensor through repeated seed sales. It should be noted that national PVP legislation differ: some permit the use of farm-saved seed of the F2 seed from hybrid varieties, others do not.

Many countries require that new varieties undergo official trials following official registration of the approved varieties. Official registration of a variety results in its inclusion in a national list of recommended varieties approved for market release. The official trial system is one method of maintaining quality control for a variety, since the listed varieties have been tested for their agricultural performance and quality. Release decisions are based either on results from independent public trials, on testing data supplied by the breeder, or on both. The appropriate trial strategy for the official registration should be jointly decided by the licensee and the licensor and included in the license agreement.

In addition to decisions concerning PBR and official registration strategies, the licensor and the licensee must agree upon who will oversee applying for and maintaining the PBR and national list entries.

6. Royalties

For the rights to commercial exploitation of the plant varieties granted under the license agreement, the licensee pays the licensor a royalty. A royalty can include not only the fee agreed to by the licensor and the licensee, but all fees connected with the use of the licensed varieties, such as fees for FSS and acreage fees.

There is no blueprint solution: for each variety license the royalty has to be negotiated separately. Nevertheless, a few royalty-calculation principles can be used on their own or in combination: fixed royalty rate, royalties connected to the seed price, minimum royalty rate, royalty intervals and sold quantities, and multiplication acreage and end-point royalties.

7. Effect of termination

Termination of the agreement will have both immediate and long-term effects on the licensee and the licensor. Controversy can be avoided by defining the consequences of termination on the licensed varieties and the remaining seed at termination. The varieties can be divided into three groups: 1. Marketed varieties, 2. Varieties to enter the market soon, and 3. Varieties in trials.

8. Reporting to licensor

It is recommended that the agreement specify the information that should be transferred between the parties (usually from the licensee to the licensor) on a regular basis. This information could include anything relevant to the activities resulting from the license agreement, such as:

- marketing plans and sales targets for the season(s)
- sales reports and forecasts throughout the season
- royalty statements
- variety trialing plans
- variety trial results
- seed certification reports
- copies of documents connected to PBR and a national list, such as application forms and PBR certificates

Establishing such routines through the agreement will facilitate establishment of a transparent communication and relationship and will help both parties achieve their goals and continue to improve cooperation.

Results:

Licensing plant varieties is very well developed in western world where most of it happens among private seed companies. It is less developed in the developing countries particularly in Africa, where when it happens, it between public and private sectors. African countries have what it takes to support variety licensing with the great benefits it brings to both licensors and licensees including:

1. A good number of countries are signatories of UPOV that enables countries to have PBRs
2. A good number of countries have PBRs
3. There is appreciable growth of private seed companies in Africa. Most of these are MSMEs which need to in-license varieties to increase their portfolios.
4. Africa has a large parastatal seed sector that counties cannot sustainable support financially and that can benefit from royalties from out-licensing varieties.

There are numerous variety licensing draft templates that interested parties can use. There, however, are benefits of licensing in similar ways in individual sectors. Vegetable crop breeders developed the “International Licensing Platform Vegetable ("ILP") in 2014 with the main objective to enable worldwide access to biological material covered by patents for the purpose of vegetable breeding, whilst safeguarding incentives to invest in patentable inventions. As a result, the ILP will boost innovation and competition in the industry (Michael and Floris, 2016). The ILP creates a platform bringing together patentees and licensees of patents and patent applications covering biological material needed for vegetable breeding purposes. In that sense the ILP falls into to the broader definition of a “clearing house”. The ILP guarantees breeders' access to patents of participating patentees, whilst it also ensures that patentees will be rewarded for their innovation. Hence, the key principle underlying the ILP as a solution for the issues described above may be expressed as "free access but not access for free". Given its innovative set-up and structure, the ILP may potentially serve as a prototype for multiparty licensing structures in other industries where intellectual property rights are prevalent and access through conventional licensing negotiation is not satisfactory (Michael and Floris, 2016).

Focusing on Kenya as an example of a market where food production is mostly for subsistence purposes, Munyi et al., 2018 sought to establish whether licensing of plant breeders’ rights is a mechanism that can facilitate access to seeds and planting material to smallholder farmers. It was found that licensing strategies that are employed in market conditions such as those prevailing in Kenya usually involve some form of

market differentiation. This is to ensure that the targeted beneficiary is reached. It was also found that whatever licensing strategy is employed, each has some advantages and disadvantages. Further, not-for-profit technology brokers have emerged with a view to absorb some costs in the licensing process which are otherwise out of reach for smallholder farmers. Breeders also waive some of their rights with respect to protected varieties. The use of licensing as a tool to facilitate access to seeds and planting material for smallholder farmers in market conditions such as those prevailing in Kenya has, therefore, received little attention and only involves very few commercial crops. Where breeders choose to waive some of their rights, they should let farmers know to create legal certainty on utilization of accessed varieties.

A case study of a non-exclusive license between the Kenya Agricultural and Livestock Research Organization KALRO and Kisima Farms is presented here to learn lessons for other institutions and countries.

Case Study – KALRO and Kisima Farms-Case Study (non-exclusive license)

The agreement was to license potato seeds in Kenya. The national research institute (KALRO) had been doing licensing agreements for years, but with no royalties. In this effort, KALRO wanted to find a way to get its research out onto the market, while also increasing farmer access to quality potato seed. Kisima Seed Company wanted to get the latest variety of seeds out to its customers. The observations were that the licensee agreement was well-designed and can help public breeders and research institutions generate needed revenue through royalties, while expanding access to seed.

Supporting Quotes:

> *Licensing allows for the transfer of technology from the inventor to the user, while still maintaining control of how the variety is used (Kuhlmann, 2019).*

Future Plans: CESSA to highlight benefits of licensing to both the countries that have and those that do not yet have PBRS. CESSA can promote the development of the “International Licensing Platform Vegetable ("ILP")-like” institutions for other group of crops such as cereals, root and tuber crops. The ILP's started in 2014 with the main objective to enable worldwide access to biological material covered by patents for the purpose of vegetable breeding, whilst safeguarding incentives to invest in patentable inventions. As a result, the ILP will boost innovation and competition in the industry (Michael and Floris, 2016).

Call to Action (CTA)/Key takeaways:

Plant variety licensing is less used in African seed systems than in developed countries. Since it confers benefits including farmers can access more varieties from domestic and international private companies, while public breeding institution s can raise research funds from revenues from royalties, licensing should be enhanced through education and capacity building among breeding institutions.

CESSA could spearhead efforts to make the case for licensing in both the public and private sectors in African seed systems.

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