



Ministry of Agriculture
and Forestry of Finland

TUULA PEHU

Genetic resources policy of the Ministry of Agriculture and Forestry

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Tuula Pehu

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<p>Abstract</p> <p>A strong change in the operating environment highlights the strategic importance of genetic resources in agriculture, forestry and fishery. In order to strengthen the strategic grip and consistency of genetic resources policy, the Ministry of Agriculture and Forestry has decided to develop guidelines for genetic resources policy in its field.</p> <p>The key objectives of the guidelines are to integrate genetic resources into strategies for the protection and sustainable use of biological resources, to ensure the continuity of maintenance of genetic resources and to promote the responsible use of genetic resources in a changing environment.</p> <p>To promote the continuity of maintenance and sustainable use of genetic resources, it is necessary to strengthen the legal basis for the maintenance of and access to genetic resources.</p> <p>The maintenance and sustainable use of genetic resources are directed through cost-effective measures set out in the Finnish National Genetic Resources Program for Agriculture, Forestry and Fishery. Key objectives include improving the utilization of collections of genetic resources, supporting the development of genetic resource-based businesses and developing new cost-effective practices to support maintenance and sustainable use of genetic resources and access to genetic resources.</p>			
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Tiivistelmä	<p>Toimintaympäristön voimakas muutos korostaa geenivarojen strategista merkitystä maa-, metsä- ja kalataloudessa. Geenivarapolitiikan strategisen otteen ja johdonmukaisuuden vahvistamiseksi maa- ja metsätalousministeriö on päättänyt laatia toimialansa geenivarapolitiikan linjaukset.</p> <p>Linjausten keskeisinä tavoitteina ovat geenivarapolitiikan integroiminen biologisten luonnonvarojen suojelua ja kestävää käyttöä ohjaaviin strategioihin, geenivarojen ylläpidon jatkuvuuden turvaaminen ja geenivarojen vastuullisen käytön edistäminen muuttuvassa ympäristössä.</p> <p>Geenivarojen ylläpidon jatkuvuuden ja kestäväen käytön edistäminen edellyttää geenivarojen ylläpidon ja saatavuuden lainsäädäntöpohjan vahvistamista.</p> <p>Toiminnallisella tasolla geenivarojen ylläpitoa ja kestävää käyttöä suunnataan geenivarapolitiikan linjausten mukaan kustannustehokkaiden toimenpiteillä, jotka esitetään Suomen maa-, metsä- ja kalatalouden kansallisessa geenivaraohjelmassa. Keskeisiä tavoitteita ovat geenivarakoelmien hyödynnettävyyden parantaminen, geenivarioihin perustuvan elinkeinotoiminnan tukeminen ja geenivarojen ylläpitoa, kestävää käyttöä ja saatavuutta tukevien uusien kustannustehokkaiden toimintamallien kehittäminen.</p>	
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Referat	<p>De stora förändringarna i omvärlden framhäver de genetiska resursernas strategiska betydelse inom jord- och skogsbruket samt fisket. För att stärka det strategiska greppet och den strategiska konsekvensen inom genresurspolitiken har ministeriet beslutat ta fram riktlinjer för politiken kring genetiska resurser.</p> <p>De viktigaste målen med riktlinjerna är att integrera genetiska resurser i strategier för skydd och hållbar användning av biologiska resurser, för att säkerställa kontinuiteten i att bevara genresurser och att främja en ansvarsfull användning av genetiska resurser i en föränderlig miljö.</p> <p>För att främja kontinuiteten av bevarande och hållbar användning av genetiska resurser är det nödvändigt att stärka den rättsliga grunden för bevarande och tillgången på genetiska resurser.</p> <p>Bevarande och hållbar användning av genetiska resurser är inriktad på de kostnadseffektiva åtgärder som anges i Finlands nationella program för jord- och skogsbrukets samt fiskets genetiska resurser. De viktigaste målen är att förbättra användningen av genressamlingar, att rikta statens stymetoder på näringsverksamhet som bygger på genetiska resurser och att utveckla nya verksamhetsmodeller för bevarande, hållbar användning och tillgången på genresurser.</p>		
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1 The objective, purpose and goals of the genetic resources policy

In the past, there was no genetic resources policy on a strategic level, although various individual sectors might have included the conservation and sustainable use of genetic resources in their strategies and programmes. This has reduced the visibility of the work on genetic resources in natural resources policy. However, the extensive change that is taking place in the operating environment increases the strategic importance of genetic resources in agriculture, forestry and fisheries. To ensure a strategic and consistent genetic resources policy, the Ministry of Agriculture and Forestry decided to develop genetic resources policy in its sector.

The strategic goal of the policy is to achieve the ability to maintain the genetic basis of the vitality and productivity of the agriculture, forestry and fisheries in a responsible manner in changing circumstances. Another objective is to increase the social impact of the work on genetic resources carried out by the Ministry's administrative branch and its partners as part of the policy on natural resources. The purpose is to secure the maintenance and availability of genetic resources in the long term. The maintenance and sustainable use of genetic resources are directed by cost-effective measures that are presented in the Finnish National Genetic Resources Programme for Agriculture, Forestry and Fishery.

Genetic resources policy has been developed to support decision-making and steering. The genetic resources policy is implemented primarily through the strategies and programmes of the individual sectors. In addition, the policies will be implemented through the Ministry's operational and financial planning, and the performance management of the subordinate administration. Implementation of the policy will be monitored on individual strategy and programme level and as part of the regular monitoring of administration. The guidelines are updated as necessary. The framework for the actions to be taken consists of the appropriations and amount of person-work allocated in the state budget and the general government fiscal plan.

2 Basis of the conservation and sustainable use of genetic resources

The genetic resources of agriculture, forestry and fisheries are ecologically, socially and economically a key part of biological natural resources and their diversity. They form the basis of the sources of livelihood in the agriculture, forestry and fisheries, and also serve as the starting point for the development of these sectors. Genetic resources are also the most important production inputs in primary production. They are also critical assets for selective breeding that will allow these sources of livelihood to adapt to the changes taking place in their operating environment. Genetic resources are inextricably tied to risk management, crisis preparedness and the security of supply of society. They are also an important part of the national memory, history of agriculture and cultural heritage. The management of genetic resources is a long-term task.

The legal basis for the protection of genetic resources and their sustainable use consists of international treaties (Convention on Biological Diversity, CBD, SopS 78/1994, hereinafter CBD) and its supplement, the Nagoya Protocol (SopS 46/2016), International Treaty on Plant Genetic Resources for Food and Agriculture, ITPGRFA, SopS 90/2004 and the action plans under FAO: Second Global Plan of Action for the Conservation and Sustainable Utilization of Plant Genetic Resources for Food and Agriculture, GPA, 2011; Global Plan of Action for Farm Animal Genetic Resources, 2007 and First Global Plan of Action for Forest Genetic Resources, 2013. On a practical level, the genetic resources policy is partly steered by national and EU legislation, such as Commission Directives 2008/62/EC and 2009/45/EC and the corresponding MOAF Regulation 25/10 on the approval and seed trade of landrace plant varieties and vegetable varieties developed for special growth conditions.

Finland has implemented the international agreements by means of national genetic resource programmes. The National Plant Genetic Resources Programme for the Agriculture and Forestry (MOAF 12/2001) covers the genetic resources in agriculture, horticulture and forestry. The Finnish Animal Genetic Resources Programme (MOAF 17/2004) covers both native breeds of domestic animals and established breeds of domestic animals of foreign origin. The genetic resources programmes have formed the

basis for the establishment of national genetic resources collections and the organisation of work on genetic resources on the national and Nordic levels. Throughout the operations, research has been an integral part of the development of the conservation of genetic resources and their sustainable use.

Finnish National Genetic Resources Programme for the Agriculture, Forestry and Fishery was completed in 2018 and covers the genetic resources of cultivated plants, farm animals, forest trees and fish. The programme updated the previous programmes on plant and animal genetic resources. The programme also presents the key principles and objectives of the conservation and sustainable use of genetic resources, including proposed actions. The coordination of the programme is assigned to the Natural Resources Institute Finland.

3 Changes in the operating environment

Climate change, population growth, urbanization, increasing competition on natural resources, loss of biodiversity and the increased consumption of natural resources weaken the ecosystems that form the foundation for the existence of living organisms, including humanity. These trends also weaken the conditions for practicing agriculture, forestry and fisheries. The rapid pace of these changes requires that agriculture, forestry and fisheries adapt rapidly to the new circumstances. The conservation of genetic resources plays a key role in this.

Consumers' values and needs are changing. Consumers increasingly emphasize the responsible use of natural resources. This is particularly obvious in food consumption. Organic production, locally sourced foods and the origin of food steer the modern consumer's choices, even if the choices increase the price of food.

In the changing operating environment, genetic resources are strategic natural resources that serve a critical resource as our agriculture, forestry and fisheries adapt to the new environmental conditions and the changes in the economic structure in their sector, including consumption. Conserving genetic resources is necessary in order to utilize natural resources responsibly and improve the quality of final products.

4 Policies and guidance measures

4.1 Policies on the conservation of genetic resources and on ensuring their availability

4.1.1 The genetic resources policy will be included in strategies that guide the conservation and sustainable use of biological natural resources

Several horizontal and sector-specific strategies and programmes guide the use, management and conservation of renewable natural resources. The most important frameworks here are international agreements and EU legislation, strategies and programmes. Their primary objective is to reduce and adapt to the adverse effects of climate change, to promote a shift from fossil economy to bioeconomy in which non-renewable raw materials and energy sources are replaced by renewable ones, food security, security of supply and the conservation of biodiversity. A common principle in all of the frameworks and strategies is the implementation of sustainable development goals, especially in the utilization of renewable natural resources. A genetic resources policy is an inseparable part of this principle.

The EU's Common Agricultural Policy (CAP) and fisheries policy will be revised for the next programme period. The EU will also revise its bioeconomy strategy. Likewise, Finland should also revise its national strategies and action plans in the near future. The revised strategies and action plans should integrate the objectives of the genetic resources policy more tightly.

4.1.2 The regulatory basis of genetic resources policy will be strengthened

An increasing number of Nordic, European and international commitments, the international exchange of breeding material and changes taking place in the operating environment require strengthening of the legal basis of the conservation and sustainable use of genetic resources. The goals here are the securing of the continuity of conservation of genetic resources and promoting responsible use in a changing environment. Promotion of use is closely linked with facilitating availability of genetic resources and

ensuring legal certainty in the ownership and management procedures of genetic resources. The legislation must be proportional to the goals of the Finnish National Genetic Resources Programmes for the Agriculture, Forestry and fishery.

4.1.2.1 The availability of genetic resources will be secured

Increasing the responsible and sustainable use of genetic resources requires that their availability is secured. The regulation of the availability of genetic resources is mostly based on two international agreements: the Treaty on Plant Genetic Resources for Food and Agriculture and the Nagoya Protocol (2010), which is a supplement to the CBD. Finland has signed both agreements.

Treaty on Plant Genetic Resources for Food and Agriculture and AEGIS Memorandum of Understanding

The exchange of plant genetic resources under the Treaty is multilateral and applies to the cultivated plants specified in the Treaty. The exchange takes place by using a Standard Material Transfer Agreement (SMTA) specified in the Treaty. All other genetic resources belong to the scope of the Nagoya Protocol.

In addition to the agreements above, Finland has also signed the AEGIS (European Genebank Integrated System) Memorandum of Understanding that applies to European collections of plant genetic resources. Under the AEGIS MoU, Finland has committed to applying the SMTA procedure also to the exchange of genetic resources of cultivated plants that are outside the scope of the Multilateral System in cases where Finland has provided these genetic resources to the European Accessions system governed by AEGIS.

Changes in the operating environment will require additional investments in plant breeding in the future. Furthermore, to secure the broad availability of cultivated plants for plant breeding, Finland should also adopt the SMTA procedure comprehensively for all transfers of genetic resources of cultivated plants when the resources are used for research and breeding operations to which the International Treaty applies.

The Nagoya Protocol

The Nagoya Protocol is based on a CBD principle according to which the genetic resources are under the sovereign right of their respective country and each country can independently regulate the access to its genetic resources. When implementing the Nagoya Protocol, Finland decided not to regulate the access to its national genetic resources covered by the Protocol. Therefore, the access of genetic resources does not require a Prior Informed Consent (PIC) from the state, but is solely based on agreements under private law.

A significant factor in the regulation of the availability of genetic resources is the intended use of the resources. The agreements used in the exchange of genetic resources in genetic resource collections should allow a diversity of uses for the resources, such as research, breeding and hobby use. This is why the availability of genetic resources should be based on Material Transfer Agreements that reflect the intended use. For cultivated plants, the Treaty on Plant Genetic Resources also requires that the availability of genetic resources be controlled on the basis of the intended use.

Digital sequence information

The CBD and Treaty on Plant Genetic Resources have given rise to international discussion associated with the availability and utilization of genetic information contained in genetic resources when this information has been digitalised (Digital Sequence Information, DSI). Some Parties would like to include the availability of the genetic information in the genetic resources covered by the Nagoya Protocol under the framework of Prior Informed Consent and Access and Benefit Sharing (ABS) measures. The origin of DSI can be gene banks, international DSI databases or scientific publications with open access to the data. DSI can be used in research or in the development of new bio-based innovations.

From a research perspective, the proposed procedures conflict with open access policy of research-based information. Open access to information is an essential precondition to scientific research, development and new innovations. The development of the legislation on genetic resources in the administrative branch of the Ministry of Agriculture and Forestry will be based on open access to genetic information.

4.1.2.2 The legal basis of the ownership of genetic resources will be clarified

Availability of genetic resources is closely linked to the question on the ownership and right of possession of genetic resources. Finnish law contains no provisions on this. Therefore, the rights of the donors and recipients to the genetic resources to be transferred covered by the Nagoya Protocol are not clear. This applies to both private and public sector organisations, such as the Natural Resources Institute Finland, both as recipients and donors of genetic resources. This might limit interest in the use of genetic resources. This unclear situation might have detrimental effects in the implementation of Finnish National Genetic Resources Programme for Agriculture, Forestry and Fishery.

It is necessary to clarify the questions on the ownership and right of possession of genetic resources in order to make the measures governing access to genetic resources transparent, predictable and legally fair. Another reason for clarifying the situation is that the Kalmar Declaration (2003) on the availability of genetic resources and the sharing of the benefits arising from their use encourages the Nordic countries to define the legal status of their national genetic resources.

Ownership of genetic resources may be defined by special legislation separate from a particular biological resource or may be left to general legal principles. It is not foreseeable that there is a need to redefine the ownership of genetic resources. Instead, for reasons of legal clarity, regulation might be needed on the right of possession of genetic resources. Procedures on maintenance and access to genetic resources based on the right of possession of genetic resources can be aligned with the currently used procedures for exchanges of genetic resources better than procedures based on their ownership. Nevertheless, the ownership of genetic resources could still be determined on a case-by-case basis in private law agreements.

4.1.2.3 The long-term maintenance of genetic resources will be ensured

The maintenance of genetic resources is a very long-term effort. It must take into account both current needs and the still unknown needs of the future. Due to Finland's geographical location, the properties of our national genetic resources are particularly unique in cultivated plants. These unique properties play a key role in the adaptation of our agriculture to changing environmental conditions. Maintaining domestic genetic resource collections is a national obligation.

The current regulatory basis for maintaining genetic resources does not obligate to the sufficiently long-term maintenance of genetic resources. A clearer specification of the tasks associated with the maintenance of genetic resources helps to ensure that maintenance is carried out successfully also in the long term. This will stabilise the implementation of the Finnish National Genetic Resources Programme for Agriculture, Forestry and Fisheries, enables maintaining high-quality genetic resource collections, and keep the genetic resources available over the long term. Many European countries have included conservation of genetic resources in their national legislation.

The objective of the future regulation on genetic resources is to secure the genetic resources and genetic resource collections that are critical to the conservation of genetic diversity across multiple sectors in the long term. The plant and fish genetic resources that are most important for genetic diversity are stored in the *ex situ* collections of the Natural Resources Institute Finland. The coordination and execution of Finnish National Genetic Resource Programme in all sectors is assigned to the Natural Resources Institute Finland by the Act on the Natural Resources Institute Finland. Therefore, it is justified to restrict any new regulation on the genetic resources collections governed by Act on the Natural Resources Institute Finland. When developing legislation it has to be decided also whether there is a need to develop specific regulation on the status of genetic reserve forests.

To support its duties on maintaining forest genetic resources, the Natural Resources Institute Finland has partners in both the private and third sector. In these arrangements,

the rights and responsibilities of Natural Resources Institute Finland and its partners are defined by agreements. As a result of the proposals above, the maintenance of genetic resources would be based on both legislation and private law agreements. Agreements will also be developed to improve their legal validity and incentive effect.

4.1.3 Multi-level collaboration strengthens implementation of genetic resources policy

4.1.3.1 National collaboration

In order to develop a uniform national genetic resources policy, the administrative branches must engage in active and open dialogue. The work on genetic resources is linked to the administrative branches of several ministries. Other important ministries in addition to the Ministry of Agriculture and Forestry and the Ministry of the Environment are the Ministry of Education and Culture, the Ministry of Economic Affairs and Employment, the Ministry of Finance and the Ministry for Foreign Affairs. The most important collaboration forum for genetic resources policy is the Advisory Body on Genetic Resources that operates under the Ministry of Agriculture and Forestry. It deals with both the strategic and operational aspects of genetic resources policy. The Advisory Body has a wide range of representatives from different ministries and other stakeholders. Its operations are based on open sharing of information and the effort to integrate the opinions of the different administrative branches and stakeholders.

In performance management of Luke, resource allocation should go hand in hand with the planning of activities for the conservation and sustainable use of genetic resources. The targets must reflect both the long-term strategic goals and temporally limited operative objectives. This requires active interaction between the Advisory Body on Genetic Resources and the Natural Resources Institute Finland also in matters related to the performance guidance of the institute.

4.1.3.2 International, European and Nordic collaboration

Finland engages in active collaboration on both the political and expert levels in global, European and Nordic forums. Due to the large number of forums, a small country like Finland must strategically select the forums that serve Finland's national goals and enable Finland to have the largest effect on international genetic resources policy and its execution.

The field of international collaboration on genetic resources is vast. Collaboration takes place on both the political and expert levels. On the political level, the most important are the international treaties and plans of action (FAO and CBD) on which the national genetic

resources policy is based. In forestry, the FOREST EUROPE process also guides the work on genetic resources. On the expert level, the EU and Europe have collaboration networks on the plant, animal and forestry sectors that coordinate the conservation and sustainable use of genetic resources.

Collaboration on genetic resource policy among the Nordic countries is close. It focuses on the maintenance of genetic resources. A key player is the Nordic Genetic Resource Centre (NordGen) that serves as the gene bank of Nordic seed-propagated plants. NordGen's operations have significantly increased the cost-efficiency of the conservation of the national genetic resources of cultivated plants. NordGen also maintains the Nordic forest and animal genetic resource networks. It will continue to play an important role in the implementation of Finnish National Genetic Resources Programme for Agriculture, Forestry and Fisheries. However, the countries also have differing views, which has become apparent especially in international collaboration. It is important that Finland's goals regarding its national genetic resource policy are sufficiently met in the collaboration.

The European Union coordinates the Member States' positions for the international genetic resource forums. Therefore, EU lobbying efforts increase Finland's visibility in international forums. Clear objectives, their systematic promotion and a high level of expertise are important factors in increasing Finland's weight in the international fora. This requires coordination between administrative branches. The international collaboration on genetic resources must also be aligned with the national policies on international development cooperation.

4.2 Policies guiding Finnish National Genetic Resources Programme for Agriculture, Forestry and Fisheries

4.2.1 The usability of genetic resource collections will be improved by research and communications

As the operating environment changes, the connection between conservation of genetic resources and their sustainable use should be strengthened both in Finland and on the EU level. The actual needs to use the genetic resources must guide the prioritisation of conservation of genetic resources. The goal must be to have the same objectives in the entire processing chain. This can be achieved by strengthening collaboration throughout the genetic resources processing chain.

High-quality genetic resources collections form the foundation for the use of genetic resources in the agriculture, forestry and fisheries. The purpose is to increase the interest of especially plant and animal breeders in the use of genetic resources. A key part in this is the awareness of the value of genetic resources, i.e. knowledge of the useful characteristics in them.

Research is critically important in the investigation of the useful characteristics of genetic resources. The best way to promote the use of genetic resources is to invest in research on the genetic and phenotypic characteristics of the genetic resources. The research should draw on the latest scientific and technological developments in mapping of genetic resources.

Society's interest in protecting genetic resources depends on its perception of the value of genetic resources. Awareness of the conservation and sustainable use and of genetic resources should be increased in order to integrate genetic resources policy more closely with other natural resources policies and to share the responsibility for conservation with the private and third sectors.

For ordinary citizens, the concept of genetic resources is difficult to open up. Therefore, experts, officials and NGOs play an important role in helping the public understand the value of genetic resources. Effective communications is diverse and involves a wide range of content, target groups, means and channels. The goal is to put out a clear message on the significance of genetic resources for the agriculture, forestry and fisheries, nature and citizens' health and wellbeing. This creates a foundation of values that supports successful work on genetic resources.

4.2.2 Guidance measures are directed to promote the development of sources of livelihoods that utilises genetic resources

The objectives of the rural development programmes are implemented by developing and strengthening sources of livelihoods that is based on local natural resources. A good example of this is the development of local food production. The rural development programmes should pay attention to sources of livelihoods based on genetic resources, such as maintenance of native crop varieties and rearing of traditional breeds. This kind of activity promotes diversification of uses of genetic resources and promotes goals associated with biodiversity.

The special characteristics of native crop varieties and breeds form a solid basis for the productization of plant and animal genetic resources. Special products based on genetic resources are a good match with consumers' values regarding food. However, creating the conditions for successful business based on agricultural genetic resources still needs a lot

of work. Quality factors built on genetic resources are still poorly known and the product and service chains do not work properly.

To conserve native crop varieties and breeds, subsidies could also be allocated to place special products on the market and the development of the markets. Furthermore, the rural development programmes should also cover hobbyists whose purpose of cultivating native crop varieties and rearing native breeds is not business-oriented. Hobbyists could also include private and public actors fostering agricultural heritage. This would also expand and strengthen the basis of sustainable use of genetic resources.

Business based on genetic resources must be promoted by targeted R&D projects that seek to solve problems in productization of genetic resources as well as by providing advice and information in collaboration with stakeholders in the sector. The use of genetic resources in agriculture, forestry and fisheries is closely linked with their conservation. Developing opportunities for using the special characteristics of genetic resources supports the conservation of genetic resources in the long term. This allows society to take more responsibility for the conservation of genetic resources and improve the cost-effectiveness of conservation actions.

4.2.3 New operating models for maintaining genetic resources are developed to improve cost-efficiency

Changes in the operating environment and the goals of bioeconomy require increasing the utilisation of the genetic resources in the agriculture, forestry and fisheries. At the same time, however, the resources available for genetic resources work have decreased. Therefore, we need to develop new operating models for the maintenance of genetic resources and also to ensure their availability. The primary objectives are to organize maintenance of genetic resources cost-efficiently and distribute the responsibility for their maintenance more widely.

The maintenance of farm animal genetic resources is a vast field. It consists of operators in the public, private and third sectors. This model has formed over a long time. So far, the public sector has had the main responsibility for the maintenance of genetic resources. A future objective is to expand the maintenance of genetic resources from the public sector to both private and third sector operators. This diversification requires that operators' roles will be clarified and that their operations will be more closely linked to the work on genetic resource conducted by Natural Resources Institute Finland, as this would harness all available resources efficiently.

The central role of the Natural Resources Institute Finland in the maintenance of genetic resources requires a strengthening of its current role as a coordinator between the

maintainers and users of genetic resources. The Natural Resources Institute Finland must also be flexible enough to adapt to the changes taking place in the operating environment.

The core collections of genetic resources of vegetatively reproducing crops should remain in the custody of the Natural Resources Institute Finland also in the future, since the institute has the required special expertise and the fields, greenhouses and laboratories as well as the equipment and information systems for managing the collections and maintaining the variety authenticity and plant health. On the other hand, the backup collections of the above plants as well as some collections of decorative plants will be distributed to private and third sector parties outside of the Natural Resources Institute Finland.

A fundamental precondition for the cooperation between the Natural Resources Institute Finland and its partners concerning the maintenance of genetic resources is reliability and long-term continuity, in which the rights and obligations of the partners are clearly defined, including the sharing of the results of the collaboration between the parties.

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