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DISENTANGLING RIGHTS TO GENETIC RESOURCES
ILLUSTRATED BY AQUACULTURE AND FOREST SECTORS

Morten Walløe Tvedt

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House II, 1F, 7 Chemin de Balexert, 1219 Châtelaine-Geneva, Switzerland, Tel/fax: + 41 (0)22 79 72 623, info@lead-journal.org*

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Morten Walløe Tvedt*

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Morten Walløe Tvedt, Senior Research Fellow, Fridtjof Nansen Institute (FNI), P.O. Box 326, 1326 Lysaker, Norway, Email: mwt@fni.no

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* Senior Research Fellow, Fridtjof Nansen Institute. He has published extensively in the area of biological resources law and intellectual property (see www.fni.no for a complete list of publications). He has co-authored an important monograph regarding genetic resources (M.W. Tvedt and T. R. Young, *Beyond Access: Exploring Implementation of the Fair and Equitable Sharing Commitment in the CBD*, IUCN Environmental Policy and Law Paper No. 67/1 (available in English, Spanish and French, www.fni.no/publ/biodiversity.html)). Tvedt is currently working on a monograph on patent law and the *sui generis* options in the plant sector for developing countries. The author wants to thank Ane Jørem for excellent editing, comments and valuable inputs to the last version of this manuscript. Research on this article is funded jointly by the Norwegian Research Council under the ELSA Programme and forms part of the three-year project 'Exploring Legal Conditions and Framework for Marine-based Bioprospecting and Innovation' and the Nordic Council Project on Forest Tree Genetic Resources.

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1

SETTING THE STAGE

This article explores ways of understanding rights to genetic resources in two sectors that utilise these resources. The overall aim of this article is to explore property to enable a better understanding of the possibilities of establishing common pools for innovation and effective benefit-sharing arrangements that promote conservation and sustainable use of biological diversity. This is done by examining a theoretical approach to property right to genetic resources. I explore three cases to illustrate the various issues at stake. One is a patent case, one an ownership case from the aquaculture sector in Norway, and the third is from the forest sector. All three cases are explored to establish how the rights to genetic resources are working in concrete cases or sectors and to better understand how these systems can be fine-tuned in the future.

Debates on genetic resources tend to be held at the aggregate level, often without a scrutiny of actual examples. This entails a risk of ignoring practical consequences, with workable solutions lost in the translation from the aggregate level to the applied and functional one. In consequence the special needs of particular sectors and special business models may not be reflected in law and policy.¹ One issue to be explored here is why the patent system has succeeded in relative terms in making funding available for research and development. In comparison, neither the Convention on Biological Diversity (CBD) nor the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA) have so far done as much to get users of genetic resources to make resources available for conservation and sustainable use in biodiversity rich countries. This article explores the technical legal understanding of 'property' as a tentative explanation for the varied

success of these legal systems in reaching their objectives. One first and general observation is that the patent system is well enshrined in national laws in developed countries, whereas rights based on the CBD and the ITPGRFA are newer and therefore less anchored at the national level. This is one possible factor that can account for differences in the performance of the respective systems.

The inspiration for examining this topic stems from research on how to make access and benefit sharing (ABS) functional.² The aquaculture and forest sectors have been studied intensively at the Fridtjof Nansen Institute (FNI) for many years, which gives a good empirical basis to assess the potential for generalising from these three cases.³ Aquaculture and forest tree genetic resources are two important sectors currently on the agenda of the Commission on Genetic Resources for Food and Agriculture (CGRFA) under the Food and Agriculture Organisation (FAO), in addition to being part of the general system of the CBD and the Nagoya Protocol (NP). This article also seeks to shed light on the particular features of these sectors and to show how they differ from the crop plant sector. It is hoped that these case studies will lead to a better appreciation of the crucial importance of intellectual property rights in the implementation of the CBD/NP and the ITPGRFA and the work of the CGRFA.

1 Report of the Commission on Genetic Resources for Food and Agriculture, Rome, 12th Session, 19-23 October 2009, CGRFA12/09/Report (2009). This report shows that the debate is often conducted at an aggregate level even when the topic is sectors of genetic resources.

2 M.W. Tvedt, 'Beyond Nagoya: Towards a Legally Functional System of Access and Benefit-sharing' in S. Oberthür and G.K. Rosendal eds, *Global Governance of Genetic Resources Access and Benefit Sharing after the Nagoya Protocol* (Abingdon: Routledge, 2014) [forthcoming].

3 I. Olesen et al., 'Access to and Protection of Aquaculture Genetic Resources: Structures and Strategies in Norwegian Aquaculture' 272/Suppl 1 *Aquaculture* S47 (2007); G.K. Rosendal et al., 'Access to and Legal Protection of Aquaculture Genetic Resources: Norwegian Perspectives' 9/4 *Journal of World Intellectual Property* 392 (2006); G.K. Rosendal et al., *Strategies and Regulations Pertaining to Access to and Legal Protection of Aquatic Genetic Resources* (Lysaker: Fridtjof Nansens Institutt, FNI Report 7/2005, 2005) and M.W. Tvedt, *Seeking Appropriate Legislation Regulating Access and Exclusive Rights to Forest Genetic Resources in the Nordic Region* (Lysaker: Fridtjof Nansens Institutt FNI Report, No. 9/2011, 2011).

2

ANALYTICAL MODEL FOR UNDERSTANDING RIGHTS TO GENETIC RESOURCES

Ownership can be understood as a threefold relationship where the first challenge is to identify the *object* for a right; then to explore the links between the *right holder and the particular object*; and thirdly, to establish the legal relationship between the right holder and *anyone else* with an interest in the same or overlapping object. In this article, I explore how four types of rights can be analysed in this three-element approach.

Property is a broad and complex term in law and theory of law. Macpherson talks about the difference between property and mere physical possession as crucial, since property is enforceable by the organs of a state.⁴ There are several ways in which property rights can be understood and explained, and there is an extensive body of literature dealing with property rights from a theory-oriented perspective.⁵ Property can, for instance, be seen as a human right, a social relation, a natural right as a consequence of work and mixture with nature (Locke),⁶ a way of regulating society so as to maximise the total values and benefits (utilitarian), or as a result of power. Macpherson notes that 'property is a political phenomenon'.⁷ This is a relevant observation concerning rights to genetic resources as there are great differences between the political willingness of some states to make some of the property systems to genetic resources work worldwide, and of others which do not share the same enthusiasm.

In *The Right to Private Property*, Waldron takes this point of departure:

Private property, then, is not a simple relationship at all. It involves a complex bundle of relations, which differ considerably in their character and effect.⁸ [...] The concept of property is the concept of a system of rules governing access to and control of material resources. [...] private property is a *concept* of which many different *conceptions* are possible, and that in each society the detailed incidents of ownership amount to a particular concrete conception of this abstract concept.⁹

Waldron's approach to property rights can be described as functionally oriented in analysing a right as a situation obtaining between persons. Waldron includes a reference to different property systems in the same country. If we break a right down into its basic components or legal relations, perhaps we can say that a system of property rights requires a **definition of the object** (what is owned), a system whereby a person attains a particular position in **respect of that object** (the right holder), and a clarification of the **relationship** between the right holder and others with interests in the same object.¹⁰ In the cases and the general discussion arising from them, I explore traces of these three elements of a right in two ways: first, these systems of rights will be scrutinised from this perspective, seeking to analyse how the systems stack up in relation to these three components. I then take a closer look at the three cases before, in the final discussion, comparing observations from the right systems and case studies, and setting out lessons and recommendations.

4 C.B. Macpherson ed, *Property Mainstream and Critical Positions* (Toronto: Blackwell, 1978).

5 J. Waldron, *The Right to Private Property* (Oxford: Clarendon Press, 2002); G. Rainbolt, *The Concept of Rights* (Dordrecht: Springer, 2006); L.S. Underkuffler, *The Idea of Property: Its Meaning and Power* (Oxford: Oxford University Press, 2003) and Macpherson, *id.*, with further references.

6 J. Locke, *Two Treatises of Government*. Edited by P. Laslett (Cambridge: Cambridge University Press, 1960).

7 See Macpherson, note 4 above, at 4.

8 See Waldron, note 5 above, at 28 with further references.

9 *Id.*, at 31 & 35.

10 *Id.*, 27ff. See also Peter Drahos, *A Philosophy of Intellectual Property* (Aldershot: Ashgate, 1996).

3

FOUR WAYS TO CREATE RIGHTS TO GENETIC RESOURCES

The types of right explored here are possession or physical ownership, sovereign rights, contractual rights and intellectual property rights. One hypothesis to be tested here is that there are substantial differences in how these legal vehicles define the three relations of property described above, the object, the link between the right holder and the object and between the right holder and anyone else. These differences are explored as explanations for the differences in the performance of these systems in reaching their respective objectives.

One core distinction must be established. A physical organism can be said to be the object of one type of property right, whereas genetic resources, DNA or the information in the genes are ownable objects of a different type. This distinction is essential for understanding genetic resources law. The following discussions are exploring rights to the genetic resource or related objects.

3.1 Tangible Property Rights

The point of departure for exploring tangible property rights is a thought experiment. Imagine a situation where all written acts, legal systems and customary or traditional elements of law are removed from the biotechnology sector; and that there is no CBD, no patents and no contracts. Who would have the 'right' to a genetic resource? The idea of property is of one having possession of physical objects. This confers full ownership of that object unless the legal situation dictates otherwise. If this is a reasonable assumption, the right to genetic resources or any developments of them is a right of use derived from the right of possession of the physical material. In this situation, the *possession* of biological material will lead to an accessorial right to the genetic resources. We know that this is far from the situation today, but it provides us with an important basic understanding that all property rights to genetic resources are legal fictions established politically departing from this accessorial

right. The objects of these rights are created by the signing of a contract (between the holder of biological material and a user); by public international law (allocating or conferring sovereign rights to countries over genetic resources inside their territories); or by government decisions granting patent protection to an invention based on genetic resources.

To derive a right to genetic resources from the mere possession of biological material is also a political choice. It is possible to imagine a legal situation where the owner of biological material has no subsequent right to use or dispose of the embedded genetic structures. The point is that the indirect right to genetic resources derived from possession of the physical expression also needs to be scrutinised along with the three other types of right in the area of genetic resources.

An overall observation is that these rights will constitute discretions and obligations giving different stakeholders varying degrees of freedom. Turning back to the rules as they exist today, the question is what these objects according to these systems are, what has been their constituting legal fact justifying the special relationship between the right holder and the object, and exactly what action he can take to control or prevent others from doing. We shall also be keeping in mind the role of the sovereign – the regulator – in relation to each of these types of right.

3.2 The Core of a Sovereign Right to a Genetic Resource

'Sovereign rights' put countries in a legal position to regulate aspects concerning the use, ownership etc. of genetic resources. The sovereign right to genetic resources is a core concept in international genetic resources law. It is explicitly recognised by the CBD (1992)¹¹ and reconfirmed by the NP (2010).¹² The

11 *Convention on Biological Diversity*, Rio de Janeiro, 5 June 1992, 1760 UNTS 79 (1992).

12 Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization to the Convention on Biological Diversity, in Report of the Tenth Meeting of the Parties to the Convention on Biological Diversity, UN Doc. UNEP/CBD/COP/10/27, 29 October 2010.

sovereign right over genetic resources is the legal concept that prepared the ground for the ITPGRFA.¹³ In the larger legal picture, sovereign rights over genetic resources can be understood as a part of the *permanent sovereignty* over natural resources.¹⁴ Together, these three international instruments constitute a cluster of norms regulating 'genetic resources' as an object of international law. The object of the sovereign right is 'genetic resources', the main holder of the sovereign right is the states, and the others who are obliged to respect the legal position of the state are users of genetic material. One first observation here is that a sovereign right entitles the right holder to regulate but does not establish any property rights in a general understanding of this term. How these rights are implemented, allocated and made operational under national jurisdictions varies considerably between the many countries where there are no regulations of their sovereign rights, and countries with fairly developed domestic legal regulation of genetic resources.

CBD member states have different conceptions or understandings of 'genetic resource' as an object of a right.¹⁵ The definition in Article 2, CBD serves as the basis for the CBD, the NP and, to a certain extent, the ITPGRFA. 'Genetic resources' are defined as follows:

'Genetic resources' means genetic material of actual or potential value.

'Genetic material' means any material of plant, animal, microbial or other origin containing functional units of heredity.

Thus it has been noted that 'genetic resources are a subset of biological resources'.¹⁶ The definition refers to an object of biological origin, from micro-organisms to the highest forms of life. The wording 'any material' would indicate reference to the physical material, and suggests a physical concept of the object. Two concepts/criteria are crucial: *biological functionality of the units of heredity* as genetic material, and the *value* of the functional units of heredity in the organism.

The qualifying element in the definition is the specification that 'genetic material' is any material containing 'functional units of heredity', which is not further specified in the CBD. When the CBD was negotiated, 'functional units of heredity' were understood as the genes, as knowledge was linked to genes as the units of heredity as the part of biological material giving an organism its characteristics.¹⁷ A link to specific parts of the cellular structure gives a substantial impression – that genetic material is understood as a *thing*. The term 'functional units of heredity' also holds the potential for serving as a functional element in the definition. This is supported by several meanings in English of the term 'functional' as used in Article 2, CBD, for example, *relating to, having a function and working*. To be 'working or operating' can indicate a functional view of the object, leaving flexibility in the system to adapt to advances in science. If the term is linked to the parts of an organism that function as hereditary information, the substantive character of the definition may be omitted.

The second element of the definition of 'genetic resources' is that the functional units of heredity have 'actual or potential value'. ABS rests on an assumed separation between the sale of biological resources for bulk purposes and uses of the inherent genetic material as information. This in itself would indicate a functional understanding. 'Value' is not restricted solely to its economic aspects, but may be understood as 'social, economic, cultural and

13 International Treaty on Plant Genetic Resources for Food and Agriculture [ITPGRFA] in Report of Thirty First Conference of FAO, Rome, 3 November 2001, 2400 UNTS 303 (2001).

14 N. Schriver, *Sovereignty over Natural Resources: Balancing Rights and Duties* (Cambridge: Cambridge University Press, 2008).

15 P.J. Schei and M.W. Tvedt, 'Genetic Resources' in the CBD: The Wording, the Past, the Present and the Future (Lysaker: Fridtjof Nansens Institutt, FNI Report No. 4/2010, 2010) and M.W. Tvedt and Schei, 'The Term 'Genetic Resources': Flexible and Dynamic while Providing Legal Certainty?' in Oberthür and Rosendal eds, note 2 above.

16 Ad Hoc Open-ended Working Group on Access and Benefit-sharing in Report of the Meeting of the Group of Legal and Technical Experts on Concepts, Terms, Working Definitions and Sectoral Approaches CBD, Paris, UNEP/CBD/WG-ABS/7/2 (2009).

17 See Schei and Tvedt, note 15 above.

spiritual in nature'.¹⁸ The reference to both *actual* and *potential* further supports a functional understanding; these terms are not static, and the material might have one value when used in one way, and a different value when used in another. Potential value could then be understood as referring to possible future techniques that could unleash the potential value of the functional units of heredity, or if new areas of use are discovered at a later stage, which would underscore the functional aspects of the resources.

Tvedt and Young have discussed four possible ways of understanding 'genetic material': 1) genetic resources are the same as biological resources; 2) genetic resources as micro-physical material; 3) genetic resources understood as information, and 4): the following combination, described as:

The use of physical terms such as 'material' suggests that 'genetic resources' encompasses both (micro)-physical and intangible/informational elements – the information and its biological source. This option suggests that 'genetic resources' should include all of the following: (i) the micro/physical component (extracting, multiplying and studying genetic or biochemical material); (ii) the information (synthesis or other development, or processes to do so); and (iii) intangible and tangible being used together (i.e., where a molecule/sequence cannot be synthesised or multiplied, but must be continuously collected from wild sources).¹⁹

The many potential notions of 'genetic resources' illustrate that the term is not very well defined. Vogel

et al., argue for an understanding of 'genetic resources as natural information'.²⁰ Their view, however, disregards the importance of the micro-biological material in itself and the molecules that play a role in pharmaceutical industry, plant breeding and aquaculture to mention some of the industries using more than only the informational aspect.

The use of the term 'genetic resources' varies by international organisations working in the field, including among UN organisations.²¹ The inconsistent use of the term 'genetic resources' in relevant international discussions reduces the certainty of the system. Operating with different meanings of the same term (genetic resources) is probably one of the core challenges to making the system of ABS in the CBD function. There is an urgent need to specify in greater detail the subject matter or object of the rights when implemented in national law and in contracts – users and providers need to develop a more specific meaning of the object of the rights. If such a step of specification is taken, however, there will probably be a chance to define genetic resources with a stronger connotation to a *thing* than *information*.

In the Norwegian Marine Resources Act, for example, the subject matter is wild living marine resources.²² This way of formulating the object makes it difficult to define it as either molecular structure or information. In contrast, the Nature Diversity Act uses the term *genetic material*, which is more of a physical concept of the object.²³ As we

18 Ad Hoc Open-ended Working Group on Access and Benefit-sharing. *The Role of Commons/Open Source Licences in the International Regime on Access to Genetic Resources and Benefit-sharing: Item 3 of the Provisional Agenda (9-15 November 2009)*. CBD, 8th meeting, Montreal, 30 July 2009 (UNEP/CBD/WG-ABS/8/INF/3), p.28.

19 M.W. Tvedt and T.R. Young, 'Beyond Access: Exploring Implementation of the Fair and Equitable Sharing Commitment in the CBD', IUCN Environmental Policy and Law Paper No. 67/2, at 62-65 (2007).

20 Joseph Vogel et al., 'The Economics of Information, Studiously Ignored in the Nagoya Protocol on Access to Genetic Resources and Benefit Sharing' 7/1 *Law, Environment and Development Journal* 55 (2011) and Evanson Chege Kamau, Bevis Fedder and Gerd Winter, 'The Nagoya Protocol on Access to Genetic Resources and Benefit Sharing: What Is New and What Are the Implications for Provider and User Countries and the Scientific Community?' 6/3 *Law, Environment and Development Journal* 248 (2010).

21 See Schei and Tvedt, note 15 above.

22 Norway, *Havressurslova / Act relating to the management of wild living marine resources (Marine Resources Act)*, Norway, LOV-2008-06-06-37) Art. 2: 'Wild living marine resources belong to Norwegian society as a whole'.

23 *Naturmangfoldloven / Nature Diversity Act*, Norway, LOV-2009-06-19-100).

shall see in the following discussion, the definitions are not helpful when it comes to establishing a functional system.

In conclusion, the wording in the CBD itself does not give any one particular definition of the objects to which it refers and does not favour either information or molecular structure. The concrete implementation in national law and in contractual contexts where the term is used enjoys considerable flexibility, but this entails a challenge, as a court would be faced with unspecified matters of interpretation they hardly can be expected to have biological competence to decide.

Transferring this global legal concept into national law happens in a non-uniform manner. The state is free to allocate property rights to genetic resources to whichever national holder it finds suitable and to choose how to define genetic resources as an object for a right. Since the sovereign rights must be transformed into national law, one can hope that genetic resources legislation will add legal certainty and provide more specific definitions.

Often, however, national ABS laws either do not allocate rights to any particular right holder or make it a public right of any kind. This leaves enforcement without any clear stakeholder. This again reduces the incentives for private parties to manage the right to genetic resources. Thus, governmental institutions are often left in a quasi-rights-holder position. The CBD allocates rights to states. It is an unregulated question how each country shall allocate rights to their citizens and specify their legal position versus *genetic resources*. Often, ABS laws allocate a right to grant access to others with an interest in using the genetic resources. This lies at the core of the right to genetic resources. It is, however, also an undefined specification of the legal situation between the owner of the right (the state) and others, being national or international users of genetic material. Thus, the regulatory potential of the government is generally not used in a specifying manner. The more concrete acts or specific utilisations that are allocated would have had better potential for establishing a functional system.

This leaves the legal position of the user often in an ill-defined and unclear situation, creating an uncertain legal situation for users and impeding the

functional implementation of the CBD, the NP and the ITPGRFA as functional tools to meet their objectives. The one legal tool that aims at contributing to a more functional implementation is the private law contract. This is the main tool that can make all these three instruments of international law functional. It will therefore be interesting to explore the legal clarity provided by contracts.

3.3 Object for ABS Contracts

In implementing the CBD, genetic resources are made *objects of contracts* as a core part of exercising sovereign rights. One basic element of such contractual discussion is that the subject matter of the contract is defined through negotiations. The manner in which the object is defined in such contracts will be of growing importance as the role of the contract in ABS becomes increasingly important. Both the CBD and the NP set private law contracts as the core of exercising sovereign rights over genetic resources. In the Multilateral System for access to certain plant genetic resources, the Standard Material Transfer Agreement (SMTA) is the legal document that governs access. In the ABS system of the CBD and the more detailed one in the NP, private law contracts are a major component of making access lead to benefit sharing. These legal systems are based on private contract law as the legal tool or vehicle to make ABS work.²⁴

However, they deal differently with both the object of the contractual rights and the manner in which they regulate the object of the rights and the legal relationship between the right holder and others that are third parties to the contract.

In drafting a contract, the parties have full discretion to define the object of the contract as they will. Since a contract is binding on the two parties, this mechanism allows considerable flexibility in defining the objects of the contract and the content of the right. Contracts in ABS run the same risk of applying an insufficiently specified definition of 'genetic resources'. If the term 'genetic resources' is unclear at the level of international law or in the national

24 G.K. Rosendal et al., 'Balancing ABS and IPR Governance in the Aquaculture Sector' in Oberthür and Rosendal eds, note 2 above.

legal system, the term itself does not suddenly become a clear and specific tool simply because it is stated in a contract. If the mutually agreed terms (MAT) or SMTA refer to the object of the contract as the same unspecified *genetic resources*, the ambiguity at the international level is reproduced among the contracting parties or persons. The reference to genetic resources does not resolve what the contracting party can or cannot do simply because the object of the contract is not sufficiently specific to allow for legal certainty. The contract can have defined what may and may not be done with genetic resources as much as the parties please, but if the basic object of the right is undefined, defined acts based on that ill-defined object will never be sufficiently specific to create legal certainty and enforceability.

To conclude, the contract could specify what the recipient can and cannot do with the biological material or genetic resources that are transferred. Which specific acts are allowed? Which consequences will different actions trigger? Which defined acts are considered an infringement of the contract? The level of precision a contract should provide for is crucial if the contract is to be a tool for making the CBD functional.

3.4 Patents to 'Genetic Resources'

The fourth cluster of property rights establishing rights to gene and biotechnology consist of intellectual property rights. Patents and plant breeders' rights differ, as we shall see, from the systems mentioned above. The task here is not to argue that patent law shall resolve the difficulties of the CBD, much less to argue that the countries should start to do comprehensive defensive patenting, which would not only be impractical but also not serve the objectives of the instruments of law discussed in this article. The task is to learn from the patent system at the institutional level to draw lessons on how the property institution is built up.

Patents are used to establish exclusive rights to innovations also in the sphere of bio- and gene technology. Since inventions based on genes are often protected by this legal system, it is essential to distinguish the manner in which the patent system defines its objects. The following section discusses and compares how these clusters of property or

rights resolve the rules constituting the 'object', the legal basis for property; and how the contents of the rights are set up so as to enable the system to function.

The object in patent law is precisely defined in the patent claims of each patent that, read individually and in conjunction, specify the product or process which is under the exclusive right. In this system, it is the patent applicant who describes what he claims to have invented. As a trade-off, *quid pro quo*, the patent applicant must share information with the public regarding the more specific details of the invention. This individualisation of the object makes the right enforceable before a court since it becomes relatively easy for the judge to assess whether these specific objects have been used by others.

The creation of the patent right happens individually by the patent applicant meeting the patent criteria. The invention must be regarded as novel, inventive and have industrial application. When these criteria are met, the patent is granted. Compared to the ABS contract the patent is one-sided in the sense that it is defined by the applicant of the right. The patent office also has very limited competence to require the applicant to limit the patent claims and thus the scope of the object of the right. In ABS contracts, negotiations between the parties are assumed to take place. This exposes the negotiation of an ABS agreement to be a cumbersome process. Also in ABS contracts one of the parties might have a disincentive to enter into such an agreement, whereas in patent law, the patent holder will have a strong interest in getting the patent in place, which will be binding on everyone else when granted; no one can voluntarily decide to withdraw from its binding effects. The public authority does not have a strong interest in rejecting the patent application because the patent does not oblige the patent office; it only grants an exclusive right to the patent holder.

Third, the patent system enumerates well-defined and specific actions the patent holder can prevent others from doing with the object of the patent. These acts are even globally harmonised in Article 28 of the TRIPS Agreement, concerning 'Rights Conferred':

1. A patent shall confer on its owner the following exclusive rights:

(a) where the subject matter of a patent is a product, to prevent third parties not having the owner's consent from the acts of: making, using, offering for sale, selling, or importing²⁵ for these purposes that product;

(b) where the subject matter of a patent is a process, to prevent third parties not having the owner's consent from the act of using the process, and from the acts of: using, offering for sale, selling, or importing for these purposes at least the product obtained directly by that process.

These actions, combined with the object as specified in the patent claims, create a very detailed and specific system of rights. This level of detail is easily enforced by the court. Thus, there are a number of characteristics associated with the patent system that makes this system far more enforceable and functional in its details. To test these differences in practice, I explore three cases from the aquaculture and forest tree sectors to illustrate how these systems of rights play out in different sectors. The examples we are going to look at in the next section concern a patent; a question of physical possession; and a situation of a right based on the act implementing the sovereign rights.

4 CASES OF PROPERTY RIGHTS TO GENETIC RESOURCES IN AQUACUL- TURE AND FOREST SECTORS

4.1 The Norwegian Nature Diversity Act Applied to the Forest Sector

In Norway, the main act regulating access and exchange of genetic resources is the Nature Diversity Act, as previously mentioned. The government is

vested with powers to implement an administrative system requiring authorisation for access to genetic material in Norway, but this has yet not been done. One of the most relevant provisions is found in Article 58.2, according to which control over either the biological material or the land/ground may exclude other persons from having access to the genetic material as well. Collection for the purpose of using genetic material follows two other types of rights: a) the right to the ground where the biological material exists; and b) the right to control access to the biological material where the genetic material is found. Both these types of legal rights give the respective right holder a remedy to stop access to the genetic material. However, they do not allocate any right to the material as such, only a right for the landowner to be respected when it comes to his right over his land. Until the government has availed itself of its powers under the Nature Diversity Act, access to genetic material is for all practical purposes open also in Norway, subject to rights to the ground and the biological material.

The legal basis for the non-commercial and commercial harvesting of berries and mushrooms etc. is found in the General Civil Criminal Code (Article 400), where it is specifically treated as a public right. In addition, the right is emphasised in a circular issued by the Ministry of the Environment.²⁶ There has also been an initiative to include these rights in a separate paragraph in the Outdoor Recreation Act.²⁷ In practice, the same rights apply to genetic resources as these laws allow for the collection of biological material in limited quantities, of e.g. cones and seeds, although this is not specifically mentioned in these laws.

In principle, the right to collect and sample genetic material in Norway is unregulated subject to the restrictions on the biological material and the land. The government (Ministry of the Environment) has competence to require foreign users to gain permission to export genetic material to other countries. This competence has, however, not been used. When that is done, one can assume that access to Norwegian genetic material for foreign users will require some kind of license or authorisation.

²⁵ This right, like all other rights conferred under this Agreement in respect of the use, sale, importation or other distribution of goods, is subject to the provisions of Article 6.

²⁶ Norway, Circular T-6/97 Outdoor Recreation, Ministry of Environment, 2 December 1997.

²⁷ Norway, Outdoor Recreation Act, 1957 (Friluftsløven).

Taking material in an area where Norway applies a so-called 'everyman's right', which is roughly speaking a right of access, passage and certain uses of non-cultivated areas enjoyed by all persons in Norway, creates different situations which might give rise to different types of legal questions. To give some examples: biological material can be picked for different purposes, the main difference being between commercial and non-commercial use. Another dimension is what the material is going to be used for, e.g. re-sowing, breeding, or gene technology. These examples are not necessarily dealt with identically by the different national legal systems that intend to give the general population physical access to specific natural environments.

In legal terms, the everyman's right, *Allemannsretten*, is dealt with specifically by the Outdoor Recreation Act of 1957. Elements of this right are positively defined and refer mostly to freedom of movement across the land of a private landowner. The Act secures access of individuals to non-cultivated land, with certain exceptions. An important distinction is made between arable land and its equivalent (*innmark*, §2), such as cultivated land, grazing land for livestock, the land around private dwellings and fenced-in areas where general access is prohibited or restricted. Land to which everyone has access (non-cultivated/non-domesticated land, *utmark*, §3) is consequently all land that is not defined as cultivated land. That means that the land to which the everyman's right applies is negatively defined, so that one must prove cultivation/domestication to establish a legal reason to prevent the public from accessing the land. The right to cross non-cultivated land applies all year around, as long as care is taken. There are restrictions on the use of motorised vehicles, but no specific restriction applies to genetic resources. The everyman's right has a very strong position in Norway, and resolves to some extent the question of access to forest tree genetic resources where, according to the Nature Diversity Act. When collecting biological material on the basis of the everyman's right, no one has the right to hinder access to the genetic resources as specified in §58. Basically, ownership of non-cultivated land cannot be used to prevent anyone from collecting biological material also when the intention is to use the genetic material. The everyman's right is negatively defined by the Criminal Act, which states that some types

of collection are illegal and punishable by law. This means that for semi-bred material used in re-forestation or plantations in the open forest there is no particular legal regulation of the right to the genetic material.

The relationship between the Nature Diversity Act, which establishes genetic material as a common resource, and the everyman's right is obviously not clear. In the Treebreedex Report this is understood as: 'For instance in Norway, forest biological resources are in the public domain and therefore seen as accessible to everyone for use (Everyman's Rights)'.²⁸ When the Ministry of the Environment finalises the administrative regulation to the Nature Diversity Act, it will not contain an accurate description of the legal situation, as also forest tree genetic material probably will require a permit. Before such a regulation of access is in place, the actual legal situation continues to be unclear and the system of rights to genetic resources under the Nature Diversity Act does not specify what the situation is, and provides no legal certainty for users of forest tree genetic resources.

Having provided this account of the situation on the ground regarding forest tree genetic resources in Norway, the time has now come to look into the situation of the aquaculture sector in Norway and offer concrete examples of how international and domestic laws have affected this sector in Norway.

4.2 The Nature Diversity Act and the Sale of the Norwegian Breeding Company AquaGen to EW Group²⁹

Only a few decades ago, the commercial aquaculture sector in Norway was of a very limited size, but has grown to become a success story of value creation

28 Treebreedex, 'A working model network of tree improvement for competitive, multifunctional and sustainable European forestry', Final Report 12 (2011).

29 M.W. Tvedt, 'Offentlig finansiert forskning og økonomisk suksess' ('Publicly Funded Research and Economic Success'), in Hallvard Fossheim and Ingjerd Oslo eds, *Forskning og penger* ('Research and Money') 105 (De Nasjonale Forskningsetiske komiteer, 2012), available at <https://www.etikkom.no/Documents/Publikasjoner/som-PDF/Forskning%20og%20penger/Forskning%20og%20penger,%20webversjon.pdf>.

based on genetic resources. The expansion of the sector started tentatively when a breeding programme at a Norwegian university needed a reference project for theories on breeding of farm animals and verification of the research results. The result was the establishment of a fish breeding programme on salmon. The initiative, which came to fruition thanks to coincidence and serendipity, led to the birth of Norway's second largest export industry. Over the years, a substantial amount of money has been invested in research and development into commercial products. The government has funded much of this work to make AquaGen a viable commercial proposition. However, legally, there is no article in the Nature Diversity Act or the Marine Resources Act that targets the right to the breeding lines in AquaGen. Both acts regulate genetic resources from the wild or genetic resources living under wild conditions. No rule targets or secures any right for the public once genetic resources have been removed from their natural environment and used in research. In other words, bred genetic material is not covered by the scope of any of these laws.

In 2008, 51 per cent of the stocks in AquaGen AS were sold to the multinational corporation Erich Wesjohann Group GmbH (EW Group), one of the world's biggest in the field of poultry breeding. In 2013, stockholders received a bid to buy most of the remaining shares in the company. An important consequence of the sale is that ownership of the valuable breeding lines of salmon created through publicly funded research and development in Norway were transferred to foreign investors. The rules securing the right of the public to wild material are not easily applicable to bred material. This is a very interesting consequence of the manner in which the system of rights under the Nature Diversity Act is set up. By creating a privately owned company, a legal barrier was put in place, reducing the public's right to salmon genetic resources, paving the way for foreign investors to buy up ready-made breeding lines. The Nature Diversity Act, if applied, could have required the EW Group to apply for permission if it wanted to collect a far more limited quantity of unbred material in the salmon rivers. This illustrates how the regulation of the right to genetic resources and their use in the wake of the CBD is failing to address the actual values.

4.3 The Fish Virus Patent – Exclusive Right to Pancreas Disease Virus³⁰

The second example of how the system of rights plays out on a national level in the aquaculture sector is more concretely linked to patent law and concerns a patent on a virus. Pancreas disease entails a considerable annual cost to Norwegian fish farmers. It was only in the 1990s that a virus was identified as a possible source of the symptoms of the disease. In 1995, Irish researchers registered a patent on the actual virus that causes the disease, based on samples found in Ireland. It was done as a product patent on a naturally occurring virus. The foundation of the patent was that the researchers identified and isolated the virus in its naturally occurring state.

According to the Norwegian Patent Act, only 'inventions' may be patented. However, administrative and judicial practice has interpreted the concept of 'invention' to mean something different than the ordinary understanding of the word. Prior to the patent application, several researchers had shared their findings on a correlation between the disease and a viral infection. These results were published in scientific journals and presented at a conference prior to the filing of the patent application, but the patent system awards these researchers no rights. The sole right is given to those taking the final step in creating the 'invention', and in applying for a patent.

Historically, patent systems require a patent to be granted in each separate state to have binding effect on and in that state. In Europe, the European Patent Organisation (EPO) grants patents with binding effect upon all member states. Current developments indicate further European harmonisation of the patent system.³¹ The patent system is built on the fundamental requirement that the applicant describes his invention in writing. Concerning biological material, writing such a description can be challenging.

³⁰ *Id.*

³¹ M.W. Tvedt, *Norsk genressursrett: rettslige betingelser for innovasjon innenfor bio- og genteknologi* (Oslo: Cappelen akademisk forlag, 2010); M.W. Tvedt, 'The Path to One Universal Patent' 37/4 *Journal of Environmental Policy and Law* 297 (2007) and M.W. Tvedt, 'One Worldwide Patent System: What's in It for Developing Countries?' 31/2 *Third World Quarterly* 277 (2010).

In order to make patents more available in the field of bio-inventions, the Budapest Treaty³² gave patent applicants the possibility to deposit samples of the material the applicant wanted patented.

Patents, then, give an exclusive right to all commercial use of a virus that is described in the written description and deposited in accordance with the Budapest Treaty. What makes this particular patent interesting is that it not only encompasses the samples deposited, but goes further by including the phrase ‘closely related strains that have similar genotypical or phenotypical characters’. The Norwegian company Pharmaq learned in 2006 that a vaccine belonging to Intervet did not have the desired effect on pancreatic disease and Pharmaq developed a vaccine of their own based on *inter alia* previously published academic research results on the virus strain SAV-3 that attacks Norwegian farmed salmon.³³ Intervet then filed a lawsuit against Pharmaq and one of the key questions in that lawsuit was whether the vaccine developed by Pharmaq constituted a strain that was ‘closely related’ to the patented virus. The Norwegian strain was unknown when the patent was applied for. The conclusion of the Appellate Court of Norway was that viral strains originating in Norway which Pharmaq had used were indeed protected by the patent, despite a difference in the two viri and despite the two strains of virus having split off from each other more than a hundred years ago.

It is interesting to observe that when the Norwegian researchers (then employed at the University of Bergen) identified SAV-3, i.e. the Norwegian strain, this finding was considered sufficiently new for publication in a peer-reviewed journal. According to the judicial conclusions, however, these results fall in part within the scope of the granted patent. What is acknowledged as new in an academic setting may thus already be covered by an existing patent. The ruling of the Appellate Court provides for

surprisingly wide protection of a previously granted patent. The Norwegian parliament has repeatedly instructed the courts and the patent office to follow a restrictive line of interpretation, a line that cannot be said to be reflected in the ruling of the Appellate Court. The Court does not even discuss the right of the public to virus SAV-3 found in Norwegian waters and subject in principle to the sovereign rights of Norway. Neither the Marine Resource Act nor the Nature Diversity Act was invoked.³⁴

The lesson we can draw from this particular case is that a patent on a virus can monopolise an entire field of research on similar viri. Not only does the patent protect research that the patent applicant could foresee at the moment of application, but all research on viri causing these symptoms. The patent also prevents the making of a vaccine from similar strains found in nature that were not known to the inventors at the time. The company that takes the (until then) final step in the chain of innovation is given a twenty-year long monopoly on remedying a disease that costs Norwegian fish farmers dearly, and others who do research on this disease are not rewarded for their work. Taking these consequences into consideration, one may ask whether it is in the interest of fish farmers and the community as a whole to have a system where a product patent can be granted with an exclusive right to a naturally occurring virus. The specificity of the patent right shows a legal system which has a vast potential to establish well-defined objects of commercial rights, far more enforceable than those established by the Nature Diversity Act.

5

DISCUSSION AND DRAWING LESSONS

5.1 Legal Certainty Provided by the Patent System

In patent law, the applicant defines what he or she claims to have invented, i.e. the object of the patent

³² *Budapest Treaty on the International Recognition of the Deposit of Microorganisms for the Purposes of Patent Procedure*, WIPO, 28 April 1977, 1861 UNTS 362, entered into force 19 August 1980, as amended on 26 September 1980 (1977).

³³ K. Hodneland et al., ‘New Subtype of Salmonid Alphavirus (SAV), Togaviridae, from Atlantic Salmon *Salmo Salar* and Rainbow Trout *Oncorhynchus Mykiss* in Norway’ 67/(1-2) *Dis Aquat Organ* 181 (2005).

³⁴ See Marine Resources Act, note 22 above and Nature Diversity Act, note 23 above.

right. The way in which this is done is usually by including a written definition in the patent claims.³⁵ For biotechnological innovations, the Budapest Treaty is an important supplement.³⁶ Here, the biological material as deposited defines parts of the object of the right. Unlike the situation in the CBD and national implementation of property rights, this way of setting and defining the object of the right is functional and provides for great clarity. The object is defined in each event of the establishment of a patent right, which makes it tailor-made. This leads to a very functional design for the system of rights, rather than the general and unspecific term 'genetic resources'.

The patent system also establishes a detailed list of actions to be included under the exclusivity of the right. Thus, patent law defines both the object of the right and how it can be utilised under the exclusive right of the holder. The patent system circumvents all challenges facing sovereign rights under the CBD and their implementation in national legislation. The dynamic in the specification of the object of the right and the further dynamic in combining it with a relatively broad set of actions make a patent right very functional indeed. The challenge is, however, to transfer these institutional lessons to the implementation of the CBD.

5.2 Contractual Rights

The contractual mechanism under the CBD has the potential to enable a functional definition of the object in question. Here, the careful drafting of the *object* of the contract and the *actions* allowed by the contract will become crucial to the functionality of this type of right. One should therefore avoid as far as possible the term *genetic resources* as a term defining the object of the contract, but rather spell out in more detail which actions the contractual partner has the explicit right to perform with the biological material. And when such explicit utilisation options are set in the contract, they can be connected to specific consequences pending the

realisation of each utilisation. According to both Article 15, CBD and the NP, the main way of enforcing a country's sovereign rights is by invoking private law contracts – MATs – between the providing country and/or country of origin and the user, the latter often thought of as a private company from another country. ABS largely relies on contracts as the relevant means of regulating the transfer.³⁷ A tool capable of rendering ABS functional is to ensure these contracts are well drafted in the sense that the rights are defined and enumerated, just as the patent system does for patents, including specifying what is not permitted after the transfer.

For forest tree genetic resources, contracts are typically used to regulate stands of trees and regeneration of the forest tree genetic material. In the aquaculture sector, the sale of smolt to salmon farmers is generally regulated by contract. Typically in commercial contracts the permitted acts of a successor will be well defined. The contractual mechanism in this case might therefore become more functional, because it takes into consideration a plausible chain of events.

5.3 Developing a Functional Understanding of Genetic Resources

In setting the legal standard for ABS legislation in a domestic situation, countries and other providers of genetic resources should strive towards defining the object 'genetic resources' functionally in legislation and, more importantly, in contracts. If the law or a permit system focuses on granting the right to conduct specifically defined types of research and development activities, while restricting other types of legal positions and activities, a long step will have been taken towards a functional understanding of genetic resources. Adopting a functional manner of understanding genetic resources would require specifying prior to the point of time at which the biological material crosses national borders that no

35 *Patent Cooperation Treaty*, WIPO, 19 June 1970, entered into force 24 January 1978, as amended on 28 September 1979, 3 February 1984 and 3 October 2001 1160 UNTS 231 (1970).

36 See Budapest Treaty, note 32 above.

37 T.R. Young, 'An International Cooperation Perspective on the Implementation of the Nagoya Protocol', in E. Morgera, M. Buck and E. Tsioumani, *The 2010 Nagoya Protocol on Access and Benefit-sharing in Perspective - Implications for International Law and Implementation Challenges* (Leiden: Martinus Nijhoff, 2013).

substantial rights are transferred. Several questions arise as to how such an agreement could be structured. Various enforcement challenges ensue from a specific and enforceable understanding of the object to a use right or property rights.

As to the degree of ownership to the genetic material transferred and the rights to innovation based on that material, two main alternatives arise for ownership: transfer of complete ownership in the sense that the receiver has the full title to the material; or transfer of the right to conduct certain types of R&D on the material. In both situations, property rights to the inventions based on the material will need to be specified in the contract which defines the legal situation of the user. One important issue is the part played by the rights to the material as a basis for new inventions. As to the question of rights to innovation based on the material, one may ask whether the contract should require co-ownership or the establishment of a partnership between the parties. From a business perspective, co-ownership is not always acceptable, as it may entitle someone outside the control of the shareholders to a stake in decisions concerning the intellectual property of the business. Co-ownership of a patent is not a clear-cut or easily accepted way of applying for a patent in all jurisdictions.

In either of these two situations, an agreement must establish a system for benefit sharing in accordance with the CBD/NP. A contract cannot predict all possible developments in the contractual relationship, so some flexibility needs to be built into the contract. Typically, a company will seek to eliminate uncertainty in the contractual relationship by specifying as much as possible and securing itself against unwanted eventualities.

This look at four core types of rights, tangible property, sovereign rights, contracts and patents, has disclosed a significant difference among them when it comes to their potential as functional and substantive rights to objects. When enforcing sovereign rights and when establishing property rights to genetic resources in a national system, states could potentially learn from the structure and system in patent law, as a patent right is defined and set up as a highly functional right. Contracts hold the potential to avoid the problems of defining or

delimiting the term *genetic resources* and they might become more functional if, in transferring the object and the acts, they draw lessons from patent law, build on a more specific and functional definition of the object, and enumerate in detail which acts are allowed and which are prohibited, as the system set out in patent law provides for.

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