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Korea's Access and Benefit Sharing Regime: The Nagoya Protocol, Domestic Legislation, and Future Steps*

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Abstract

The Nagoya Protocol on access and benefit sharing of biological genetic resources is an international agreement that aims to share the benefits arising from the use of genetic resources in a fair and equitable way. It is considered one of the great innovations in global environmental governance and is expected to generate new opportunities for scientific progress. Korea has made considerable efforts to address the upcoming changes in global governance for access and benefit-sharing (ABS).

This paper provides an analytical survey of Korean biodiversity law and then summarizes and evaluates the legal and policy responses of the Korean government to ABS, with a focus on marine biological resources. Government departments differ as to the best approach to ABS in the Korean legal system, and the necessary incentives may not yet be present for the final resolution of ABS in Korean law.

Key Words: Convention on Biological Diversity, Nagoya Protocol, Marine biological resources, Korean domestic law, Access and Benefit Sharing

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I. Introduction

Marine genetic resources, like other genetic resources, have generally been widely accessible and available in the modern era.[1] The massive exploitation of genetic resources and the unequal distribution of benefits obtained from them present sources of conflict and controversy. Most profits incurred from genetic resources have been monopolized by developed countries, where advanced technology allows for easier resource extraction and exploitation. However, only a few developed countries are capable of accessing and reserving genetic resources from marine environments. As one of the nations with the necessary resources and infrastructure to obtain and utilize marine genetic resources, the Republic of Korea (Korea) has faced the present challenges of securing fair and reasonable access to scientifically valuable resources.

This article explains and evaluates the efforts made in Korea to codify and implement access and benefit-sharing (ABS) principles to facilitate efficient and mutually beneficial use of genetic resources. It provides an account of the present Korean law on biodiversity and Korea's legislative and administrative approaches to ABS. Finally, we offer some observations and suggestions regarding next steps in the advancement of ABS under Korean law.

II. Korean Biodiversity Law and ABS Implementation

1. Act on the Conservation and Use of Biological Diversity

In the 1960s, there were only three acts to protect Korean biological resources: the Forestry Act, the Cultural Heritage Protection Act and the

1) When the UN General Assembly adopted the Declaration of Principles Governing the Sea-Bed and the Ocean Floor, and the Subsoil Thereof, beyond the Limits of National Jurisdiction, it proclaimed that the sea-bed and the ocean floor are the common heritage of mankind. Kemal Baslar, The Concept of the common Heritage of Mankind in International Law (1998). However, there is now a dispute about whether the common heritage of mankind principle can be applied to marine genetic resources on the deep sea-bed or not.

Natural Parks Act. These laws, however, contained only basic legal content, and failed to recognize and protect the diverse sources of value that emanate from ecosystems, biodiversity, and biological resources. In addition, these laws had failed to play a substantial role in the protection of biodiversity of the country due to development-oriented policies. Korea's biodiversity management has developed greatly since 1990s, as Korea joined the Convention on Biological Diversity in 1995 and has subsequently emphasized sustainable development principles in public policy.[2] In the 1990s, many new laws for the protection of biological resources were promulgated, a trend that intensified in the 2000s.

In this context, the Korean government enacted the Act on the Conservation and Use of Biological Diversity (the "Biological Diversity Act") in 2012. The Ministry of Environment explained the purposes for the enactment of the legislation in the following way: "In particular, since the adoption of the CBD, it has been necessary for the conservation and sustainable use of biodiversity to include national biodiversity surveys and plans. There has been a growing need for strengthening national responses. However, the biodiversity of Korea was continuously declining due to lack of comprehensive management of national biodiversity. Also, the policies related to biological resources were managed only by each ministry. In order to secure the ecosystem health of the whole country, the national biodiversity should be established in a comprehensive and systematic manner, and the basis for sustainable use of the biodiversity should be established. The institutional basis for the active implementation and coping of the Convention on Biological Diversity shall be established. And to contribute to the promotion of international cooperation, Korean government is aimed at establishing biodiversity conservation and legislation."[3]

The purpose of the Biological Diversity Act was to improve national life and enhance international cooperation by promoting comprehensive and

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2) Hyun-Woo Lee, *Status and Future Direction of Biodiversity Policy in Korea*, 9 Environmental Law and Policy 11, 14 (2012) (in Korean).

3) Public announcement of Ministry of Environment No. 2010-204, "Announcement of establishment proposal for Act on the Conservation and Use of Biological Diversity", Ministry of Environment, Retrieved June 4, 2018, from http://www.me.go.kr/ (in Korean).

systematic conservation of biodiversity and the sustainable use of biological resources, and by laying out ways of implementing the Convention on Biological Diversity (CBD).[4] The Biological Diversity Act outlined the duties of state and local governments, and citizens; however, the articles do not go into detail and are declaratory in nature.[5] The Biological Diversity Act further provides, "Except as otherwise expressly provided for in any other Act, conservation of biodiversity and use of biological resources shall be governed by provisions of this Act."[6] In this respect, this statute can be fairly described as the basic law for conservation of biodiversity and use of biological resources.

Further principles contained in the Biological Diversity Act should be noted. The Korean government is to establish a new strategy for conservation of biodiversity and sustainable use of the components thereof (a national strategy on biodiversity) every five years. According to the Biological Diversity Act, the government may investigate the status of biodiversity for conservation of biodiversity and sustainable use of biological resources. Moreover, this directive has a unique feature; specifically, one of the provisions states that scientific inquiries should be made in collaboration with residents to the north of the Military Demarcation Line.[7] However, the words "the Democratic People's Republic of Korea" are *not* found in any provision. This may be the case because South Korea's Constitution recognizes the *entire* Korean Peninsula as the territory of Korea. In this manner, the Biological Diversity Act reflects the special situation on the Korean Peninsula.

Furthermore, the Biological Diversity Act has a long list of specifics, including certain requirements for outbound transfer of biological resources, a National Biodiversity Center established to conduct duties regarding biodiversity and biological resources in the relevant area, a National Biodiversity information-sharing system along with the National Biodiversity Center to implement the CBD and manage national biodiversity information comprehensively, protection of Traditional

4) Article 1 of Act on the Conservation and Use of Biological Diversity.

5) *Id.*, Article 4, 5.

6) *Id.*, Article 6.

7) *Id.*, Article 9.

Knowledge, fair and equitable benefit sharing from the use of biological resources, and prerequisite tests of alien species for any hazards to the local ecosystem.

As noted, the Biological Diversity Act is the central Korean law on the subject of biodiversity. Though government ministries have different laws on life resources, most of these laws define limitations on approaches to biological genetic resources but do not specify positive provisions. Such laws include declaratory phrases only in relation to access and benefit sharing, the core issue of the Nagoya Protocol.

2. Laws Related to Marine Biological Resources

Marine-specific biological resources are also a major concern. Korea has enacted various laws in relation to biological resources in marine environments and fisheries, having commenced this process in 2009. Major laws on marine and fishery biological resources, such as the "Act on the Acquisition, Management, and Utilization of Biological Research Resources," "Act on Conservation and Use of Biodiversity," and "Act on the Acquisition, Management, and Utilization of Marine Bio-resources," all distinctively address various types of resources. However, they all have similar purposes in terms of legislating conservation, management, or the use of genetic resources.

Most of these laws include provisions for the development of a master legal plan, organizational structures for effective natural resource management, and an integrated resource information center.[8)]

In particular, the "Act on the Acquisition, Management, and Utilization of Marine Bio-resources" (the "Act on Marine Bio-Resources") stipulates provisions regarding access by foreigners, permission and designation of responsible organizations, approval for resource distribution, and resource export. However, this law was re-enacted due to governmental reorganization. There were two different laws on marine organisms because the laws fell under the jurisdiction of two ministries, the Ministry of Land, Transport, and Maritime Affairs, and the Ministry for Food,

8) *See* Park, Su-Jin, " A Study on the Reorganization for the Legal System of Marine and Fisheries Bio Resources", Korea Maritime Institute, 2013 (in Korean).

Agriculture, Forestry, and Fisheries, when the laws were enacted. However, because the current administration combined those two ministries into the Ministry of Oceans and Fisheries, the laws also needed to be re-enacted in one unified scheme. To effectively deal with policies on marine organisms, one unified ministry had to take overall responsibility for conservation, management, and utilization of marine biodiversity, so the Act on Securing, Management, and Use of Marine Biological Resources and the Act on Conservation, Management, and Use of Agricultural and Fisheries Biological Resources were reorganized into the Act on Marine Bio-Resources and the Act on the Conservation, Management, and Use of Agricultural Bio-resources in 2016.

It is important to note that the Act on Marine Bio-Resources was amended in December 2016 to include additional articles providing a legal basis for the benefit sharing[9] and the conservation and management of traditional knowledge related to marine bio-resources.[10] On this basis, in June 2017, the Ministry of Oceans and Fisheries launched a research project on traditional knowledge in marine biology. These changes can be understood as a demonstration of the Ministry of Oceans and Fisheries' commitment to disciplined benefit-sharing as well as access. However, only two other Korean statutes have a benefit-sharing provision: the Act on the Conservation and Use of Biological Diversity and the Act on Access and Utilization of Genetic Resources and Sharing of Benefits. This situation

9) Article 25 (Sharing Profits from Marine Bio-Resources) 1. The profits arising from research and development outcomes of marine bio-resources and marine biological traditional knowledge, and the commercial use thereof, etc. shall be fairly and equally apportioned between the provider and the user of marine bio-resources.

2. The Minister of Ministry of Oceans and Fisheries may promote policies for fairly and equally sharing profits from marine bio-resources.

10) Article 26 (Protection, etc. of Marine Biological Traditional Knowledge) of the Act on the Acquisition, Management, and Utilization of Marine Bio-resources.

In order to promote conservation and use of marine biological traditional knowledge, the government shall push forward the following policies:

1. Discovery, research and protection of marine biological traditional knowledge.
2. Establishment of information gathering and management system of marine biological traditional knowledge.
3. Establishment of foundation for using marine biological traditional knowledge.
4. Training and promotion of marine biological traditional knowledge.

makes the relationship between the two laws more difficult to establish.

3. Acts Related to Access and Benefit Sharing (ABS)

Many countries have established legal frameworks to implement the Nagoya Protocol. In the case of Korea, although a bill for implementing the Nagoya Protocol (the "2013 Bill"), which included ABS provisions, was submitted to the National Assembly in 2014, it subsequently expired without further legislative action. However, in 2016, subsequent legislation for the implementation of ABS obligations succeeded. This resubmitted 2016 bill took into consideration both provider and user perspectives and was finally adopted and entered into force in August, 2017 as the Act on Access and Utilization of Genetic Resources and Sharing of Benefits (the "Act on Genetic Resources").

The Act on Genetic Resources supplemented the stated objectives of the 2013 Bill with provisions on improving national life and promoting international cooperation, as well as an emphasis on processes and procedures related to the Nagoya Protocol.[11] Other parts of the text were little changed, and the changes that were made were not meaningful or significant. On balance, the Act on Genetic Resources proved to be not very different from the 2013 Bill.

The Act on Genetic Resources provides a solid legal foundation for establishing policies on approaches to, and utilization of, genetic resources, as well as a declaration for the utilization of domestic genetic resources, and policies on access and benefit sharing from exploitation. The main content of the law is as follows: a foreign user who wishes to use genetic resources from Korea must declare himself to the National Provision Authority (Article 9(1)), although that user is not required to obtain approval or registration by the national authority. The provision does not actually state that the parties must develop mutually agreed terms (MAT) but, rather, that they should strive to establish MAT, and the national authority may assist with reaching a fair and equitable agreement (Article 8(2)-3). This

11) Ji Young Son, *Korea's Protection Strategy for its Traditional Knowledge Associated with Genetic Resources under the Nagoya Protocol*, 11 The Journal of Intellectual Property 95, 113 (2016) (in Korean).

provision is, therefore, not excessively restrictive from the user's point of view. One party must simply declare that it wishes to develop MAT, and the responsible government authority can assist in forming and managing a fair and equitable deal. However, in the case of the 2013 Bill, authorization would have been required. This can be said to have been changed to a position that is more favorable for the user.

The profit-sharing provision (Article 11) states, "Providers and users of genetic resources should agree to share the benefits of domestic genetic resources fairly and equitably." This mandate might be viewed as stricter than that of the 2013 Bill, because the 2013 Bill stipulated that "[p]roviders and users of genetic resources should make an effort to agree to share the benefits of domestic genetic resources fairly and equitably." However, it is only a general statement. There is also no provision to impose sanctions on those who violate those provisions.

When assessed as a whole, the duty imposed by Article 11 is seemingly a very light one for users of Korean domestic resources. This approach may have been aimed at strengthening bargaining power in Korean use of resources in other jurisdictions. However, it is doubtful whether this relatively permissive approach to foreign users of Korean domestic resources has any positive effects when a Korean person or entity uses resources in foreign countries, because user countries' legal frameworks will not have a great influence on the content of contracts. In the development of legal requirements and the adoption of governing law for particular agreements, provider countries are likely to continue to favor laws that impose meaningful obligations on users. In addition, as we have already seen, it would likely not be disadvantageous to Korea to impose a stronger obligation on foreign users, because the future value of Korean marine living resources is not presently known, and may be considerable.

There is another problem with the regulation related to access. There are no restrictions when Koreans access domestic genetic resources. The more favorable treatment of Korean users of domestic genetic resources may give rise to a perception that the regulation is not even-handed.

Looking at the detailed provisions of this act, we can see that the act has the following characteristics. The key terms used in this act are defined in Article 2, and these definitions are very similar to, but not exactly the same as, the definitions of CBD and the Protocol. First, the expression

"derivative" is missing not only from the definition provision, but also from the entire text of the law, and it can be said that this narrows the scope of the law by excluding derivatives. This drafting approach likely resulted from Korea's primary focus on its role as a user country. There is also a definition of utilization in Article 2, but the act does not list concrete activities that it considers utilization. Furthermore, when the utilization is considered to have commenced and how long it lasts are not prescribed by law, so it cannot provide the criteria necessary to establish how providers' rights and duties relate to genetic resources, which portends trouble ahead when this act is applied.

What about a simplified procedure for researchers or non-commercial users? This is an important issue from the research perspective, because the Nagoya Protocol simplifies these procedures and waives them for countries that have developed prior informed consent (PIC). Indeed, Korea simplified procedures or issued waivers to the parties (Article 10-2). However, the definition of "non-commercial research purposes" remains unclear. A simplified procedure will be difficult to implement without more specific provisions on what is meant by "non-commercial research." The questions remain: how can commercial and non-commercial use be distinguished, and to what extent can these two categories of users be treated differently?

Issues associated with the rights and protection for Traditional Knowledge (TK) of Indigenous Peoples and the Local Community (ILC) are widely discussed these days. The CBD and the Nagoya Protocol also address this matter. The preambles of the CBD and Nagoya Protocol state that indigenous and local communities are not simply users of genetic resources but are closely connected with them and that they embody traditional lifestyles based on biological genetic resources.[12] Regarding TK and ILC, the article dealing with TK (Article 12 of the Nagoya Protocol) uses ambiguous language such as "as appropriate" and "in accordance with." In the case of Korea, it is almost impossible for knowledge associated with genetic resources to be held by indigenous and local communities, because it is difficult for any community in Korea to be recognized as an ILC. The Nagoya Protocol allows individual states to determine the details

12) Won Suk Park & Sung Ryul Choi, *Current Trend for Protection of Traditional Knowledge under Convention on Biological Diversity*, 18 Chung-Ang Law Review 159, 162 (2016).

of implementation with regard to legislative, administrative, and political measures, so Korea could reflect on that situation. According to the Act on Genetic Resources, traditional knowledge is defined as "knowledge, technology and practice, etc. of individuals or local communities which have maintained a traditional life style appropriate for the conservation and sustainable use of genetic resources" (Article 2-2), thereby extending the range of traditional knowledge set by the CBD, as part of efforts to protect the traditional knowledge of Korea. However, except for this, it does not seem likely that Korea will try to introduce new measures to improve a situation in which there is almost no way to protect TK in Korea.[13] It may be necessary to legislate to protect the traditional knowledge of genetic resources that are not protected in Korea under domestic law. However, the problem is that it is difficult to meet the novelty requirements of the current patent law, and certain works also enjoy copyright protection.[14]

In particular, in Article 7(1) of the Genetic Resources Act, the Ministry of Foreign Affairs and the Ministry of Environment are National Focal Points of Korea, and Article 8(1) designates Competent National Authorities, which consist of a plurality of agencies (Ministry of Science, ICT and Future Planning; Ministry of Agriculture, Food and Rural Affairs; Ministry of Health and Welfare; Ministry of Environment; Ministry of Oceans and Fisheries). There is a high probability that information will be dispersed, causing confusion in information management and access. In other words, when the centers serving as hubs of information are distributed or designated as plural, it is difficult to expect administrative efficiency to provide information, which leads to confusion in accessing and using information. In addition, administrative costs can be excessive. That is why the role of the Genetic Resources Information Management Center (Article 17) becomes important. Accordingly, it is highly necessary to establish an integrated information hub center in order to enhance accessibility and efficiency of information users and maximize the reduction of organization installation and operation costs. There are two types of genetic resource information centers: the integrated type and the decentralized type.

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13) Son, *supra* note 11, at 115.

14) Changyoul Lee, *Legal Issues regarding the implementation of Nagoya Protocol*, 29 SungKyunKwan Law Review 61, 78 (2016) (in Korean).

Type	Advantage	Disadvantage
integrated	- Improved accessibility of information. - Reduction of organization construction and operational cost of the genetic resources information management center. - Minimization of overlapping role among ministries in the management and operation of relevant information for ABS. - Close bonds with the National Focal Points.	- Difficulties in coordinating and agreeing among ministries in deciding on ministry to operate a genetic resources information management center. - Difficulties in improving cooperation among ministries in establishing and operating a genetic resource information management center.
decentralized	- Each Ministry has its own genetic resources information management center, which is very likely to be politically feasible. - Easy-to-establish internal organization and reduction of internal transactions.	- Very poor access to information. - Difficulties in coordinating national policy with sectionalism of ministries. - Much overlap between the ministries and high transaction costs between ministries. - Ineffectiveness of coordination of work with National Focal Points and Centers is expected. - Substantial share of national budget required for the operation and maintenance of multiple genetic resource information management centers.

Source[15)]

It is also necessary to establish a standardized reporting form for the convenience of the applicant who wants to access Korean domestic genetic resources. However, distinctive report items may be required depending on the jurisdiction of the National Focal points, such as permission to acquire marine life resources.

15) National Institute of Biological Resources, "A study on information management of Access and Benefit Sharing of Genetic Resources: the 1st year" (2016.11) at 19 (In Korean).

Lastly, the norms for legislative and administrative measures are provided by Article 26 (Penal Provisions), Article 27 (Confiscation and Collection), and Article 28 (Administrative Fines) to enforce compliance with access and use requirements. However, these provisions have been fairly criticized for imposing a very low level of punishment, as well as lacking a compliance verification mechanism.

4. Coherence between the Act on Marine Bio-Resources and the Act on Genetic Resources

The Act on Genetic Resources applies to "plants, animals, and microorganisms containing a genetic functional unit or other genetic material which becomes genetic origins, which have practical or potential value" in accordance with Article 2 of the Biological Diversity Act. The range of marine fisheries and biological resources to which the Act on Marine Bio-Resources applies is defined as follows: "[A]ny marine animals and plants, micro-organisms, and other living creatures with real or potential value and information such as valuable facts revealed during the use of such living creatures; marine fisheries and bio-genetic resources; any fisheries resources, micro-organisms related to fisheries and other living creatures referred to in subparagraph 1 of Article 2(1) Fishery Resources Management Act, and information such as valuable facts revealed during the use of such living creatures." Accordingly, both laws are likely to apply to marine living resources. Upon closer examination, according to the current legal system, when a domestic user accesses and uses a foreign genetic resource, only the Act on Genetic Resources applies. On the other hand, if the domestic marine genetic resources are used by foreigners, both laws are likely to apply, and thus the relationship between the two laws needs to be clarified. However, other ambiguities persist.

First, the relationship between the two acts is unclear. If the relationship between the two acts is one of general law and special law, confusion will be reduced when deciding the order in which they are applied. Both acts, however, have provisions under the title "Relationship with other Acts." In this provision, each act provides that "except as otherwise provided for in any other Act, the access to and utilization of genetic resources and benefit sharing shall be governed by the provisions of this Act" (Article 5 of the Act

on Genetic Resources) or "except as otherwise provided for in any other Act, securing, management, and use of marine fisheries and biological resources shall be governed by the provisions of this Act" (Article 6 of the Act on Marine Bio-Resources). Because both laws declare themselves to be general laws, it intensifies the confusion.

However, with regard to PIC, Article 9 of the Act on Genetic Resources stipulates that for procedures under the cases in which permission was granted under Article 11(1),[16] or for which approval was received in accordance with Article 22(1)[17] of the Act on Marine Bio-Resources, reporting will be deemed to have been done in accordance with the Act on Genetic Resources. Therefore, it is clear that the approval of acquisition under the Marine Bio-Resources Act does not require an access report according to the Act on Genetic Resources. On the other hand, there is no specific provision on whether an acquisition permission/approval pursuant to the Act on Marine Bio-Resources should be separately received when a foreigner reports under the Act on Genetic Resources. However, according to the provisory clause of Article 11(1) of the Act on Marine Bio-Resources, "[T]his shall not apply in cases of obtaining permission/approval or under Acts related to marine bio-resources, or a treaty entered into or an agreement reached by the Government of the Republic of Korea." If the reports under Article 9 of the Genetic Resources Act meet this condition, it is considered unnecessary to obtain permission/approval. In the case of

16) Article 11 (Acquisition of Marine Bio-resources by Foreigner, etc.) of the Act on the Acquisition, Management, and Utilization of Marine Bio-resources

(1) Where a foreigner, foreign institution and international organization, etc. (hereinafter referred to as "foreigner, etc.") intends to acquire marine bio-resources in jurisdiction waters for research or commercial use, he/she shall report it to the Minister of Ocean and Fisheries: Provided, That this shall not apply in cases of obtaining permission·approval or under Acts related to marine bio-resources, or a treaty entered into or an agreement reached by the Government of the Republic of Korea.

17) Article 22 (Approval, etc. for Removal from the Republic of Korea) of the Act on the Acquisition, Management, and Utilization of Marine Bio-resources

(1) Any person who intends to remove from Korea any marine bio-resource included in the list of objects subject to approval for removal from Korea prepared by the Minister of Ocean and Fisheries shall obtain approval therefor from the same Minister: Provided, That the foregoing shall not apply where distribution to a foreign country has been approved pursuant to the main sentence of Article 20(1).

Article 9 of the Act on Genetic Resources, foreigners should report to the head of the competent national authority, and the competent national authority for marine bio-resources in accordance with the Act on the Acquisition, Management, and Utilization of Marine Bio-resources is equivalent to the Ministry of Oceans and Fisheries. In conclusion, although the priorities of the two acts are not clear in application, the relationship between both acts for PIC will not cause a significant problem.

However, both acts use the terms "access" and "acquisition." The Act on Marine Bio-Resources does not provide a definition of "acquisition," and it is not certain whether "access" and "acquisition" can be regarded as substantially the same. Since the report and permission are different administrative acts, there are also subtle differences, which result in problems with consistency and application.

III. Conclusion

In addition to legal reforms, governmental plans and infrastructural developments have provided the basis for Korean biodiversity policy. In each area, however, there is a lingering and deep concern that the values of biodiversity are not being promoted organically.[18] In particular, the policy and systems for biodiversity conservation in Korea have been much criticized for lacking integrated and cooperative management of biodiversity. These critiques assert that various ministries with different interests in biological resources are managing bio-resources in their own particular ways. Although each ministry is trying to respond quickly to changes in the international movement, such as the 2010 adoption of the Nagoya Protocol, the differing priorities of the ministries have made consensus and collaboration elusive. Some have attributed ineffective and unsystematic conservation of biodiversity to indiscriminate enactments and

18) *See* Lee, *supra* note 2; Yoon, IckJune, *Legal Issues on Biodiversity Conservation in Korea*, 2 Sogang Law Journal 91 (2013) (in Korean); Park, Jong-Won, *Korean Experience in Implementing Nagoya Protocol and the Related Legal Issues*, 37 Environmental Law Review 67 (2015) (in Korean); Lee, Sang-Jun, *A Study on the Declaration for Access to Korean Genetic Resources in Implementing Nagoya Protocol etc.*, 38 Environmental Law Review 295 (2016) (in Korean).

inconsistent enforcement of laws on the use of biodiversity. On the other hand, the Biological Diversity Act and the Act on Genetic Resources, which are known as for the basic laws for CBD and ABS, have subsequently been enacted, but these laws have not yet rectified the problem because the law of biodiversity has not been reordered around these new cornerstones to produce a coherent system of biodiversity governance.

Given these urgent criticisms, what needs to be done to achieve an effective and systematic legal system for management of biodiversity in the future? We suggest three points of particular concern in the advancement of Korea's biodiversity law and policy regime.

First, because Korea has designated multiple Competent National Authorities, the Ministry of Environment's role as Genetic Resources Information Management Center is very critical. Given the challenge of maintaining a smooth process for collecting, managing, investigating, and providing information related to foreign and domestic access and use of genetic resources and benefit sharing, a properly resourced and well-managed hub for the dispersed information produced by various ministries is essential. As a further step, it is also necessary to establish an administrative system for providing effective information from Competent National Authorities and National Checkpoints under Article 17(3) of the Act on Genetic Resources.

Further, more efforts are needed to promote the legal sophistication to comprehensively implement the Nagoya Protocol domestically. The Nagoya Protocol has leveraged its strategic ambiguity to make progress in major areas of the conservation system, but its interpretation and implementation have not yet encompassed the subtler issues related to biodiversity conservation. Because of this special situation, the Act on Genetic Resources still contains vague articles. This can damage legal stability and impede law enforcement. The Korean government should endeavor to improve transparency in the use of genetic resources and to fill the gap in the criteria for sharing for commercial and non-commercial purposes.

Finally, considering the unique characteristics of marine bio-resources, conservation and use of these resources should be managed with a distinct and carefully tailored set of standards. Even within marine biological resources, there is a wide range of resources, which can broadly be divided

into "food" (fisheries and aquaculture) and "non-food" (pharmaceuticals, other chemicals and novel materials and a wide range of bio-processing).[19] In keeping with the approach embodied by the Act on Marine Bio-Resources, and in the interest of efficient governance, these two groups should be managed with different standards. In addition, marine bio-resources are more mobile than terrestrial biological resources due to environmental conditions such as ocean currents. Since this gives rise to complex transboundary issues, it is necessary to establish additional criteria for the characteristics of marine bio-resources rather than to apply uniform standards for terrestrial and marine life.

In sum, greater institutional and statutory complexity is needed for Korea to take the next steps in the regulation of bio-resources and biodiversity. In particular, it is advisable for Korean law and policy-makers to empower a centralized and well-structured inter-ministry governance system and to engage with the distinguishing characteristics of marine biological resources with a vigorous lawmaking process.

19) Department of Agriculture Ireland, "Marine resources and the bioeconomy" - Department of Agriculture, Retrieved June 10, 2018, from < https://www.agriculture.gov.ie/>.