REMOTE SENSING ISSUES AS THEY RELATE TO KOREA

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I. INTRODUCTION

The development of space activities in Korea, despite its relatively brief history, has grown at a tremendously rapid and remarkable pace, similar to the swift progress of industrialization in Korea. Particularly, activities related to remote sensing have emerged as one of the most active fields in space industry. Remote sensing activities have been developed on two tracks: the first one relates to the development of satellites for the purpose of remote sensing, and the other concerns the interpretation and utilization of data obtained through satellite observation. For this reason, Korea, like other advanced countries, is challenged by legal problems arising from remote sensing issues. Some legislation exists, although it is at a very early stage. The purpose of this article is to introduce space activities in Korea, particularly focusing on remote sensing issues, and to discuss the legal regulations and problems related to remote sensing within the framework of relevant Korean laws.

II. EVOLUTION OF REMOTE SENSING IN KOREA

Even though Korea was at one time crushed into ruins at the outbreak of the Korean War (from 1950 to 1953) and left with traumatic wounds throughout the period of Japan's colonization (from 1910 to 1945), Korea has achieved astounding economic growth and miraculously transformed itself into one of the top ten economic powers in the World. The rapid pace of development of space activities in Korea is quite remarkable as be-

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ing analogous to its rapid economic growth. During the early stages of industrialization, Korea was not ready to invest in a high-technology industry such as the space industry, which would require an ***enormous*** amount of ***capital,*** because the elimination of national poverty remained the most urgent priority in order to fulfill its very fundamental needs. Korea's Aviation Industry Act whose sole purpose was to regulate the aviation industry subsequently led to the enactment of Aerospace Industry Development Act in 1987, which, at last, included the regulation of activities in outer space.[1] Since then, the investment in R & D of space activities began to be vigorously encouraged. The development of the very first satellite, named *KISAT-1*, began around this time and was launched as a test satellite in 1992. Along with two scientific sounding rockets, the second satellite, known as *KISAT 2*, was also launched in 1993. The Korea Telecommunication Company (KT) subsequently deployed the communications satellites, *KOREASAT 1*, *2* and *3*, in 1995, 1996, and 1997 respectively. As a result, the use of satellites was extended to include commercial purposes. However, those commercial satellites and rockets which reached orbit were still manufactured by foreign corporations.

Serious efforts were made to achieve self-developed satellites and finally realized through the development of *KISAT 3*, a Micro Science Satellite with a weight of 100 kg, as well as the very first multipurpose satellite called *KOMPSAT 1*. *KOMPSAT 1*, whose life span has now expired, was manufactured in 1999 by the Korea Aerospace Research Institute (KARI) together with TRW in the United States. In 2003, Korea launched *KOMPSAT 2* and began the Communication, Ocean Monitoring & Metrological Satellites Program. Currently, *KOMPSAT 3* is being manufactured jointly with Astrium, a German corporation, and is to be launched in 2011. *KIMPSAT 5* is also being jointly manufactured with Thales, an Italian company, and is scheduled for launch in 2010. In 2003, *Science Satellite 1* was launched using a Russian launch vehicle and completed its mis-

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[1] *See* Doo Hwan Kim, *The Main Contents of the New Space Development Promotion Act in Korea*, PROCEEDINGS OF THE 48TH COLLOQUIUM ON THE LAW OF OUTER SPACE OF IISL 290, 291 (2005).

sion in 2006. *Science Satellite 2* was launched on a KSLV-1, Korea's first jointly manufactured rocket with Russia, in August 2009. However, it was not able to carry out its function due to a launch failure. Consequently, it was re-manufactured and re-scheduled for launch again on June 9, 2010. However, the second attempt was not successful either. Therefore, the satellite currently under operation is *KOMPSAT 2*.

Along with the manufacture and launching of satellites, in 2009, the Korean government attempted to launch the very first self-made Korea Space Launch Vehicle (KSLV) from the NARO Space Center in Oeinaro Island, located in the southern province. Though the attempt to launch failed, a test for a micro rocket was successfully conducted with the aid from Russia. The second launch also failed on June 9, 2010.

The following tables show the status of various satellites which are already developed or are expected to be developed in the near future.

Scientific Satellites

Category	**KISAT No.1**	**KISAT No.2**	**KISAT** No.3	Scientific Satellite **No.1**	Scientific Satellite **No.2**	Scientific Satellite **No.3**
Purpose	obtain basic technology	utilize obtained technology	Develop technology	Earth observation	earth observation	earth/space observation
Weight	50kg	50kg	110kg	106kg	99.4kg	Within 150kg
Altitude	1,300km	800km	720km	680km	300 ~ 1,500 km	Within 700km
Life Span	5 years	5 years	3 years	3 years	2 years	2 years
Total Cost	3.2 million($)	2.6	6.7	9.4	11.8	15
Rocket	Ariane-4(France)	Ariane-4(France)	PSLV (India)	Cosmos(Russia)	KSLV-•(Korea)	TBD
Launch Venue	France	France	India	Plesetsk(Russia)	Korea	TBD
Launch Date	Aug'. 11,92.	Sep.26,'93.	May 26, 99.	Sep.27,'03.	1st:Aug..25, '09. 2nd:June 9, 2010	'10(expected)
Operating Status	mission completed ('96.12) operation terminated (‘4.08)	Mission completed ('97.12) operation terminated (‘02.10)	mission completed ('01.04) operation terminated (‘02.12)	mission completed ('06.05) under technical test	1st launch failed 2nd launch failed	not launched

Multipurpose Satellites, Communication, Ocean Monitoring and Metrological Satellites

Category	multipur-pose satellite **No. 1**	multipurpose satellite **No. 2**	multipurpose satellite **No. 3**	multipurpose satellite **No. 3A**	multipurpose satellite **No.5**	Communication Ocean Monitoring & Metrological Satellite
Purpose	earth observation	Detailed observation of earth	detailed observation of earth	detailed observation of earth	All-weather earth observation	Communication, Ocean Monitoring, Metrological observation
Weight	470kg	800kg	1,000kg	1,000kg	1,400kg	2,500㎏
Altitude	685km	685km	685km	530km	550km	36,000㎞
Life Span	3 years	3 years	4 years	4 years	5 years	7 years
Resolution	Black/white image 6.6m	black/white image 1m Color image 4m	black/white image 0.7m Color image 2.8m	infrared image 5.5m black/white image 0.55m Color image 2.2m	radar image 1m	Metrology 1km Ocean 500m
Launch Date	Dec.21,'99.	Jul. 28,'06.	'11(expected)	'13(expected)	'10(expected)	'10(expected)
Operation Status	mission completed (08.2)	on operation	not launched	not launched	not launched	not launched
Total Cost	187mil.($)	219	239	178	207	296
Budgets by Ministries	MOST : MOI MOIC	MOST MOI MOIC	MOEST MOKE	MOKE	MOEST MOKE	MOEST CBC MOLMA MA
Manufac-ture Com-pany	KARI TRW (USA)	KARI Elop(Israel)	KARI, Astrium (Germany)	KARI Astrium (Germany)	KARI Thales (Italy))	KARI Astrium (France)
Rocket Projectile	Taurus (USA)	Rockot(Russia)	H-IIA(Japan)	TBD	Dnepr(Russia)	Ariane-5(France)
Launch Venue	USA	Russia	Japan	TBD	Russia	France

III. VARIOUS USES OF REMOTE SENSING IN KOREA

Remote sensing technology is used for various purposes in Korea, and such uses have been significantly increasing in terms of both quality and quantity. The Korean Society of Remote Sensing was established and publishes a bi-monthly journal with articles covering various topics related to remote sens-

ing.[2] Other academic societies in the field of science and technology have also joined to solve the various issues pertinent to remote sensing. Remote sensing is specifically used in cartography; forestry; environment; agriculture; ocean; meteorology; geosciences and mineral resources; land and urban planning; water resources; and lifestyle information.

First, remote sensing is used for cartography. In previous years, a map was often created from a ground survey and aerospace photographs, a time-consuming and costly endeavor involving a substantial number of human resources. However, generating and updating a map became much more prompt and efficient over a wide region with high-resolution images obtained by remote sensing. Moreover, the remote sensing technique made it much less expensive and more convenient to update information as data could now be obtained on a regular basis. A rather unusual case, Korea has also generated a map of the Military Demarcation Line – where aerial photographs are prohibited due to the military confrontation – in the scale of 1:10000 by using high-resolution satellite images.

The second area is forestry. Remote sensing technology is used to research vegetation and soil as well as to study biological and ecological groups in forestry. To be specific, the research covers a wide range of studies including observations of changes in vegetation growth and soil moisture on an annual basis, the intensiveness of soil erosion, drawing the boundary between forests and grasslands, ecological approaches to forest fires, crop growth and organic soil, estimation of the crop situation, time-series of harvest, warning of pest infection, and crop disease.

Third, in the field of environmental protection, remote sensing technology is used to analyze the condition of environmental resources in order to ascertain the feasibility of the data for land cover classification or ecological maps. In case of environmental remodeling, the integrated interpretation of satellite images and documents from field research is also used.

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[2] *See e.g.,* Seok Hyun Lim and Hae Chun Choi, presentation at the Korean Society for Marine Environmental Engineering Conference: Thermal Discharge along the South Channel of Myodo in Gwangyang Bay using a Numerical Model and Remote Sensing (2007) (on file with author).

Fourth, high-resolution satellite images by remote sensing is also used in agriculture in order to assess crop conditions, conduct physiochemical analysis on soil, or to prevent agricultural disasters.

Fifth, remote sensing is used in ocean surveillance. Korea, a costal country, is surrounded by sea on three sides. Thus, it efficiently utilizes the high-resolution satellite images to monitor its infrastructures on costal area, reclamation projects, harbor facilities, and fisheries. Particularly, remote sensing is significant to preserve ecology, as it is useful for assessing the present conditions and changes of wetlands in the west coast. Also, remote sensing technology is very valuable to protect the ocean environment, as it can detect illegal aqua farms.

Sixth, remote sensing is used in meteorology as a means of assessing atmospheric environmental conditions and developing weather prediction systems through satellite images.

Seventh, in the sphere of geosciences and mineral resources, remote sensing is used for the exploration of precious underground resources, detecting earthquake and geological features, monitoring abandoned mines, and evaluating water quality in their surrounding areas.

Eighth, remote sensing also functions as a means to solve problems arising from the rapid land and urban development. It is employed to grasp the physical structures of urban cities and metropolitan areas, as well as to predict the patterns for urban growth. Furthermore, it also facilitates research activities in developing the demilitarized zone where civilians are not allowed to enter and management of the green belts and land release.

Ninth, remote sensing is used for analyzing river basins, water systems, and conducting feasibility studies on water resources such as reservoir, dams, precipitation, and flow rate.

In addition, remote sensing is also used for military purposes. For instance, it is helpful in Korea's unique situation with regard to the military confrontation with North Korea, as it is difficult to acquire such confidential information. However, there was a case in 1992 when North Korea announced intentions to build a *Geumgangsan* dam which was a reasonable indication of possible flood attacks on the South Korean side, and

remote sensing technology was utilized to assess the water situation to prevent possible flooding.

Another case relates to the protection of cultural assets. In fact, there was a case where remote sensing was used for revealing preserved cultural properties in North Korean regions. Other cases involved assessing forest damage by cemeteries due to Korea's unique funeral traditions. Also, remote sensing technology can potentially be used in the course of law enforcement, which will be discussed in the following chapter.

IV. LEGAL REGULATIONS OF REMOTE SENSING IN KOREA

1. Overview

As aforementioned, the legal concerns of space activities emerged in 1987 when the Korean government began to participate in space development. Initially, the government's highest priority was the development of space industry as a whole, so the relevant law was enacted to incorporate the space industry, to a certain extent, into the pre-existing Aviation Act. From then on, a number of laws have been enacted to comply with international obligations including: the peaceful uses of outer space,[3] the registration of objects launched into outer space,[4] as well as a more detailed law concerning compensation for damages arising from space activities.

2. Space Activities in general

The basic law that governs the space activities in Korea is the Space Development Promotion Act.[5] The purpose of this Act is to facilitate the peaceful use and scientific exploration of outer space, and to contribute to national security, the sound growth of the national economy, and the betterment of life of

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[3] *See* Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies, art. 3, *opened for signature* Jan. 27, 1967, 18 U.S.T. 2410, 610 U.N.T.S. 205.

[4] *See* Convention on Registration of Objects Launched into Outer Space, art. II, *opened for signature* Jan. 14, 1975, 28 U.S.T. 695, 1023 U.N.T.S. 15.

[5] Space Development Promotion Act (Act No. 10087), *enacted on* May 31, 2005, *entered into force on* Dec. 1, 2005 (as partially amended Mar. 17, 2010).

citizens through the systematic promotion of the development of outer space and the efficient use and management of space objects.[6] Its main objectives include: establishment of a "Basic Plan" for the promotion of space development,[7] establishment of a National Space Committee,[8] designation of an agency specializing in space development,[9] registration of space objects, launch permits for space objects,[10] responsibility/liability for damages caused by space accidents,[11] support for space development projects by private sector,[12] utilization of satellite information,[13] rescue of astronauts,[14] and return of space objects.[15]

Second, the Act on Compensation for Damages Caused by Space Activities[16] provides the more detailed rules of liability for damages available under the foregoing Space Development Promotion Act by setting forth the scope of compensation for damage and limitation of liability in the event of damage caused by space activities.[17]

Third, the very first law related to space is the Aerospace Industry Development Promotion Act.[18] The scope of this law is not only confined to outer space, but also covers aerospace matters broadly in order to rationally support and promote the aerospace industry, as well as to efficiently support research and development in aerospace science and technology.[19]

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[6] *Id.* at art. 1.
[7] *Id.* at art. 5.
[8] *Id.* at art. 6.
[9] *Id.* at art. 7.
[10] *Id.* at arts. 8, 9.
[11] *Id.* at arts. 8, 14.
[12] *Id.* at arts. 18, 20.
[13] *Id.* at art. 17.
[14] *Id.* at art. 22.
[15] *Id.* at art. 23.
[16] Act on Compensation for Damages Caused by Space Activities (Act No. 8852), *enacted on* Dec. 21, 2007, *entered into force* on Feb. 29, 2008.
[17] *Id.* at art. 1.
[18] Aerospace Industry Development Promotion Act Enacted on December 4, 1987, entered into force on December 5, 1988, and amended on April 1, 2009 (Act No. 9589) (on file with author)
[19] *Id.* at art. 1.

3. Remote Sensing in the Practice of Law Enforcement

A number of laws have been enacted to regulate the use of remote sensing by satellites in the course of law enforcement, mainly in the field of environmental law. First, The Natural Environment Conservation Act[20] requires the Minister of the Environment to perform an investigation of the natural environment of the nation every ten years in cooperation with the head of the competent central administrative agency.[21] Furthermore, the detailed methods of investigation pursuant to the foregoing clause and other necessary matters are prescribed in the Presidential Decree. Accordingly, the Presidential Enforcement Decree of the Natural Environment Conservation Act, as amended on December 30, 2005,[22] lays down the method of investigation and allows remote sensing via aircraft or artificial satellite along with other indirect methods through documents to be employed in Article 23(2). Moreover, the Special Act on the Preservation of Ecosystem in Island Areas including Dokdo Island[23] prescribes the obligation to conduct a fundamental survey on natural ecosystems.[24] The Enforcement Decree of this Special Act also lists remote sensing via artificial satellites as one of the investigation methods.[25] Next, the Act on Preservation and Management of Uninhabited Islands[26] requires the investigation of the actual conditions of uninhabited islands,[27] and the En-

[20] Natural Environment Conservation Act (Act No.9982), *enacted on* Dec. 31, 1991, *entered into force on* Sep. 1, 1992 (amended on Jan. 28, 2011) (on file with author).

[21] *Id.* at art. 30(1).

[22] Enforcement Decree of the Natural Environment Conservation Act, *wholly amended by* Presidential Decree No. 19245, Dec. 30, 2005 (on file with author).

[23] Special Act on the Preservation of Ecosystem in Island Areas including Dokdo Island (Act No.9696), *enacted on* Dec.13, 1997, *entered into force on* June, 4, 1998 (amended May 21, 2009) (on file with author).

[24] *Id.* at art. 6.

[25] Enforcement Decree of the Special Act on the Preservation of Ecosystem in Island Areas including Dokdo Island, Presidential Decree No.22467, Nov. 2, 2010, at art. 4(3) (on file with author).

[26] Act on Preservation and Management of Uninhabited Islands (Act No.10331), *enacted on* Aug. 3, 2007, *entered into force* on Feb. 4, 2008, Dec. 1, 2010 (on file with author).

[27] *Id.* at art. 9.

forcement Decree[28] of this Act also includes a provision similar to Enforcement of Decree related to Dokdo.[29] Other similar provisions are also found in the Enforcement Decree of the Erosion Control Act,[30] Enforcement Decree of the Fishing Villages and Fishery Harbors Act,[31] Enforcement Decree of the Coast Management Act,[32] Enforcement Decree of the River Act,[33] and Enforcement Decree of the Conservation and Management of Marine Ecosystems Act.[34]

In addition, remote sensing is explicitly referred to in Presidential Decree on Metrological Agency and Its Organizational System[35] and Enforcement Decree of the Ministry of Knowledge and its Organizational System.[36]

4. Protection of Remote Sensing Data and Regulation on its Use

To date, national legislations exclusively dealing with remote sensing issues, such as the Land Remote Sensing Policy Act of the United States[37] have yet to be enacted in Korea. Furthermore, legal disputes concerning remote sensing data have not yet given rise to relevant court cases. At present, the rele-

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[28] Enforcement Decree of Act on Preservation and Management of Uninhabited Islands, Presidential Decree No.22151, May 5, 2010 (on file with author).

[29] *Id.* at art. 10.

[30] Enforcement Decree of the Erosion Control Act, Ministerial Decree of Agriculture, Forestry and Fisheries, No.65, Mar. 27, 2009, at art. 1 *bis* (2), remote sensing by aircraft and satellite (on file with author).

[31] Enforcement Decree of the Fishing Villages and Fishery Harbors Act, Presidential Decree No.22525, Dec. 13, 2010, at art. 3 (on file with author). This article includes remote sensing by aircraft, surveying ships, and equipment for underwater shooting, etc.

[32] Enforcement Decree of the Coast Management Act, Presidential Decree No.22077, Mar.26, 2010, at art. 2(5) (on file with author) (includes remote sensing by satellites).

[33] Enforcement Decree of the River Act, Presidential Decree No.22931, Dec.31, 2009, at art. 9(5) (on file with author) merely mentions "survey obtained from remote sensing" without specific reference to "remote sensing by satellites."

[34] Enforcement Decree of the Conservation and Management of Marine Ecosystems Act, Presidential Decree No.22449, Oct.16, 2010, at art. 5(2) (on file with author) refers to remote sensing by aircrafts, satellites and surveying ships, etc.

[35] Presidential Decree on Metrological Agency and Its Organizational System, Presidential Decree No.22115, Apr.13, 2010, at Art.22 *bis* (on file with author).

[36] Enforcement Decree of the Ministry of Knowledge Economy and its Organizational System, Ministerial Decree of Knowledge Economy, No.163, Nov.1, 2010, at art.8(15) (on file with author).

[37] Land Remote Sensing Policy Act, 15 U.S.C. 5601 et seq. (1992).

vant existing laws can be applicable, to a large extent, and these laws govern the issues when necessary. In conjunction with the existing laws, the regulations stipulated by the Ministry of Education, Science, and Technology, which is in charge of managing space activities together with the Korean Aerospace Research Institute (KARI), also function as substantive rules.

The primary relevant law here is the Space Development Promotion Act. Specifically, Article 17 regulates the utilization of satellite information:[38]

> (1) The Minister of Education, Science and Technology may adopt measures necessary for facilitating the distribution and utilization of satellite information acquired by an artificial satellite developed in accordance with a master plan, such as the designation and establishment of an organization exclusively dedicated to such activities. In such cases, the Minister of Education, Science and Technology shall consult with the Minister of Land, Transport and Maritime Affairs in regard to national spatial data under the National Spatial Data Infrastructure Act.
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> (2) The Minister of Education, Science and Technology may subsidize expenses necessary for the facilitation of distribution and utilization of satellite information within the extent of budget.
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> (3) The Government shall endeavor to avoid any invasion of privacy during the course of utilizing satellite information

Pursuant to Article 17(1), Korean Aerospace Research Institute (KARI) was designated as an exclusive organization in charge. It should be noted that this article emphasizes protection from an invasion of privacy, which is stipulated in the Korean Constitution as a fundamental right, in the utilization of satellite information.

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[38] Space Development Promotion Act, *supra* note 5, at art. 17.

The second relevant law is the National Spatial Data Infrastructure Act[39] mentioned in Article 17(1) of the Space Development Promotion Act. This Act provides for matters concerning the efficient construction of national spatial data system[40] and the integrated utilization and management thereof.[41] For the purposes of this Act, spatial data refers to the data location of natural or artificial objects existing in space, including the space above ground, space under ground, space above and below water, as well as the data necessary for spatial identification and decision-making related thereto. Such information is required to be managed under an integrated database and is published in an official gazette by the Minister of Land, Transport, and Maritime Affairs. Obviously spatial information does not explicitly refer to satellite information; however, satellite information may certainly be included in the definition of spatial data. The Act also requires the head of a management institution to establish and enforce necessary security management regulations to prevent improper access to, or the use or leakage of, spatial data for which discourse is restricted in the construction, management, and utilization of spatial data. [42] Pursuant to this article, the Ministry of Education, Science, and Technology have been enforcing necessary regulations on security management and satellite information.[43]

Third, another relevant law is the Copyright Act[44] which protects the intellectual property rights of remote sensing information. In so far as intellectual property rights are concerned, relevant international agreements including the TRIPs agreement[45] can also be applied since the Korean Constitution stipulates that "treaties duly concluded and promulgated under

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[39] National Spatial Data Infrastructure Act Entered into force on August 23, 2009 (Act No.9705) (on file with author).

[40] *Id.* at art. 1.

[41] *Id*. at art. 12.

[42] *Id*. at art. 28.

[43] *See*, *infra* note 72.

[44] Copyright Act (Act No.9785), *enacted and entered into force* on Jan. 28, 1957 (amended on Feb.1, 2010) (on file with author).

[45] Agreement on Trade-Related Aspects of Intellectual Property Rights, *signed* on Apr. 15, 1994, *available at* http://www.wto.org/english/tratop_e/trips_e/t_agm0_e.htm (last visited Jan. 24, 2011).

the Constitution and the generally recognized rule of international law shall have the same effect as the domestic laws of the Republic of Korea."[46] A substantial part of the international treaties on intellectual property, to which Korea is a State Party, has been reflected in the provisions of the Copyright Act.

Remote sensing information can be classified under different categories depending on its condition.

If the data is in the form of mere signals it would not be protected under the copyright legal framework. However, if the original data can be identified as images or other forms, it may then be protected under the regulations for either copyright or database.

According to the Copyright Act, the term, "database," refers to the compiled matters whose subject matters are systematically arranged or composed, so that they may be individually approached or retrieved.[47] Also, for the purpose of this Act, "a producer of database" means the person who has made human or physical investments considerably in the production of database, or in the renewal or verification thereof.[48] Chapter IV of this Act explicitly stipulates detailed provisions on database protection for producers.[49] With regard to the national protection for database producers, foreigners are also protected by the treaties to which Korea has acceded to or which it has ratified in relation to the protection of databases. The specific rights of database producers include the rights to reproduce, distribute, broadcast, or transmit the whole or considerable parts of a relevant database. Individual subjects of a database are not deemed to be considerable parts of the database. When the reproductions of the individual database subjects, or portions falling short of their considerable parts, come into conflict with the ordinary exploitation of the databases, or when such usage infringes unduly on the benefits of database producers by making reproductions repeatedly or systematically for specific purposes; then they are considered reproductions of considerable parts of

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[46] Korean Constitution, at art. 6(1).
[47] Copyright Act, *supra* note 44, at art. 2(19).
[48] *Id.* at art. 2(20).
[49] *Id,* at arts. 91, 98.

the database. As far as judicial proceedings are concerned, it is permissible to reproduce a work, to the extent necessary, for the purpose of judicial proceedings and internal use by legislative or administrative organs, provided that it does not apply to a case where such reproduction of the database would unreasonably prejudice the interests of the holder of the property right. The reproductions are permissible to an extent so as to include non-profit public and broadcasting performances, non-commercial private use, other uses for examination questions, the visually disabled, and for temporary sound or video recording by broadcasting service providers.[50]

The rights of database producers originate with the time the database is completed, and continue to exist for five years, reckoning from the first day of the next year thereafter.[51] However, where a considerable human or physical investment has been made towards the renewal of a database, the rights of database producers for the relevant parts originate from the time of making the renewal and continue to exist for five years, reckoning from the first day of the next year thereafter.[52]

Remote sensing information may infringe upon the privacy of individuals and may become a threat to national security. With regard to the protection of an individual's privacy, the Constitution of Korea stipulates that "the privacy of no citizen shall be infringed."[53] The Military Secret Protection Act also sets forth that any person who detects or collects military secrets by means other than due process of law, shall be punished by imprisonment for not more than ten years.[54]

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[50] *Id*. at arts. 23, 28-34.

[51] *Id.* at art. 95.

[52] *Id.* at art. 98. The Article stipulates that "the provisions of Articles 53 through 55…shall apply *mutatis mutandis* to the registration of rights of database producers."

[53] Korean Constitution, *supra* note 46, at art. 17. According to the provision, some seventy Acts and Regulations including the Act on the Protection of Communication Privacy (Act No.9819) and Act on Administrative Procedure (Act No.8852) contain clauses for the protection of privacy.

[54] Military Secret Protection Act (enacted and entered into force Dec. 26, 1972, *amended* on July 22, 2005, Act No. 7613), at art. 11 (on file with author).

5. Access to Satellite Information

According to Regulation on Dissemination and Utilization of Satellite Information[55] enacted by the Korean Ministry of Education, Science, and Technology, the term "satellite information" is defined as the image data obtained through the satellites developed by the said Ministry such as scientific satellites and multi-purpose satellites, or the combined information thereof.[56] In order to systematically utilize satellite data, the Satellite Information Activities Promotion Committee was established to review matters mainly concerning the utilization of satellite information, annual plans for utilization of satellite information, selecting the agency for distributing satellite information, and fixing the standard price for dissemination.[57]

Next, the following agencies are designated as the organizations-in-charge in accordance with the scope of their activities pertinent to satellite information. KARI is primarily responsible for controlling affairs, such as the inspection of satellites, identification of satellite location, and transmission of instructions. The reception of satellite information is carried out by "the demanding governmental department" and KARI.[58] The receiving station may manage the obtained satellite information.[59] KARI is also allowed to build a receiving station overseas.[60]

The satellite information from artificial satellites is distributed and utilized through the contract with the designated distributors in order to promote the utilization of satellite information on the behalf of KARI or government agencies,[61] which are being operated independently to obtain image data on national security. KARI, which is principally in charge of managing satellite information for public and scholarly purposes, may still

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[55] Regulation on Dissemination and Utilization of Satellite Information, Sept. 28, 2007 (Regulation of MEST No. 69) (on file with author) [hereinafter Regulation of MEST No. 69].

[56] *Id.* at art. 2(1).

[57] *Id.* at arts. 4 & 5.

[58] *Id*. at art. 7.

[59] *Id*. at art 9. However, when the receiving station is established overseas, the foreign receiving station can also manage the satellite information.

[60] *Id*. at art. 8.

[61] For example, the Ministry of National Defense and National Intelligence Service.

select the distributing agency to disseminate the commercial-oriented satellite information.[62]

As far as the standard price of satellite information is concerned, information can be provided free of charge if the information is needed for purposes of promoting scientific programs, verifying the usefulness of satellite information, public promotion through broadcasting, or in any other case where the authoritative organization deems it to be necessary. In the present case, KARI directly disseminates the information for public and scholarly purposes, at the "actual price" (only expenses). Whereas, the information disseminated by distributing sales agencies are offered at a "regular price"[63] (expenses and benefits). The fixing and changing of the standard price for domestic dissemination is determined by a vote of the Satellites Information Utilization Promotion Committee.[64]

Meanwhile, KARI established the Dissemination Code for Multipurpose Satellites[65] in accordance with Article 10 of the Regulation and Dissemination and Utilization of Satellites Information enacted by the Ministry of Education, Science, and Technology. In the light of the foregoing Code, KARI holds the intellectual property rights of images obtained from the multipurpose satellites. Thus, users who are supplied with such information should not arbitrarily give out the information to others or use it for profit purposes, without prior permission from KARI. Moreover, KARI and secondary reproducers share the intellectual property rights for the value-added data supplied by KARI.[66] The process of dissemination of image data begins with submitting an application form after searching for the necessary information through the online search engines.[67] KARI manages and disseminates the standard image; however, it can provide

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[62] Regulation of MEST No. 69, *supra* note 55, at art. 10. SPOT and KAI has been designated as distributing agencies. SPOT is for Europe, Asia, Latin America and Africa; BAI is for Korea, the United States and Mid-East Asia.

[63] *Id*. at art. 12.

[64] *Id*. at art. 13.

[65] Dissemination Code for Multipurpose Satellites, Dec. 5, 2007 (Code of KARI, No.337) (on file with author).

[66] *Id.* at art. 4.

[67] *Id.* at art. 12.

the image at different levels upon the user's request.[68] The data is saved in an electronic file and transferred through the saving device.[69] The agency, which has been allowed to disseminate the satellite image for business purposes, must show the copyright mark of KARI when the agency advertises the image on the market, or when it discloses the satellite images to the public.[70]

Pursuant to Article 28 of National Spatial Data Infrastructure Act, the Ministry of Education, Science, and Technology has also adopted the Regulation on Security Management of Satellites Information.[71] This Regulation confers duties to the heads of management institutions to protect satellite data and its databases, and the Regulation requires them to enact necessary measures to protect such information.[72] Under this Regulation satellite information is classified into three types of information: non-disclosure, restriction, and disclosure.[73] In terms of the criteria for classifying the information, first, "non-disclosure" information is satellite information which reveals three-dimensional military facilities where civilians are not allowed to enter. The "restricted information" refers to data exceeding 30m resolution, which contains precisely revised second-dimensional coordination, data exceeding the resolution of 4m which discloses military facilities, and data exceeding the resolution of 90m with three-dimensional coordination. The information classified under "disclosure" includes all other data that are not subject to non-disclosure or restriction, such as a three-dimensional satellite data and information on general areas containing the detailed satellite information at the time of taking a photograph. However, when one provides or sells satellite images exceeding the resolution of 50cm, records of the seller's personal information and contents of the photos must be kept.

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[68] *Id.* at art. 13. Distribution Homepage is available in Korean at http://www.spacecapture.kr/ (last visited Jan. 27, 2010).

[69] Code of KARI, No.337, *supra* note 65, at art. 14.

[70] *Id.* at art. 11(4).

[71] Regulation on Security Management of Satellites Information, Mar. 14, 2001 (Regulation of MEST, No. 68) (on file with author).

[72] *Id*. at art. 3.

[73] *Id.* at art. 10.

For non-disclosure or restricted satellite data, only those people who directly require it for purposes of their work, are allowed to handle the satellite data, and such information should not be open to the public.[74] In addition, the Regulation sets forth measures to block access by assigning individual ID and password and locking devices. It also employs preventive measures, by building up a firewall or securing copies of the satellite databases, in the event satellite information is damaged or leaked.[75] When it becomes necessary to open the non-disclosure or restricted information to the public, it may be revealed only after the Satellite Data Review Committee thoroughly reviews the purpose for the disclosure, as well as the time and means for disclosure.[76] Non-disclosed or restricted satellite data should not be copied or printed except in cases where a head of a non-disclosed information management institution grants permission, or it is already legally permissible.[77] Also, non-disclosed or restricted satellite data should not be transferred out of the country except in cases where the data is reciprocally exchanged pursuant to an international agreement, concluded between Korea and a foreign government, or in cases where the representatives of the Korean government require it in order to negotiate with a foreign government, or to use it as reference materials when participating in international conferences or international organizations. Even when the transfer is allowed, prior permission by a head of the management institution is required.[78]

V. CONCLUDING REMARKS

Remote sensing activities in Korea are still at quite a humble stage compared to advanced countries. Yet, Korea has reached a significant technological level in designing and manufacturing remote sensing satellites. It has also been extensively utilizing satellite data. However, rules that regulate such activi-

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[74] *Id.* at art. 11.
[75] *Id.* at arts.12 & 13.
[76] *Id.* at art. 15.
[77] *Id.* at art. 16.
[78] *Id.* at art. 17.

ties are only available through departmental guidelines or via the internal rules of management agencies. As it is very likely that private sectors will soon participate in remote sensing activities for commercial purposes, the prompt enactment of a more detailed law is urgent and indispensable. Furthermore, provisions from existing decrees and regulations have to be updated in order to reflect the changes which have occurred since their legislation.

REMOTE SENSING DATA DISTRIBUTION AND APPLICATION IN THE ENVIRONMENTAL PROTECTION, DISASTER PREVENTION, AND URBAN PLANNING IN CHINA

Yan Ling[*]

Satellite remote sensing activities that were initiated in the 1970s opened new opportunities to the world for observing the Earth from outer space. By using remote sensing satellite data, it became possible to investigate the Earth's resources and environmental phenomena. The applications of this space technology in various fields have brought great benefits to the whole of humankind. China is one of the Nation-States capable of carrying out remote sensing activities. Satellite remote-sensing application systems in China have been put into regular operation in many important fields. They are playing an important role in *inter alia,* "the nationwide land resources survey, ecological construction and environmental protection, as well as in major State projects."[1]

This paper first introduces the remote sensing activities carried out by China alone or in cooperation with other countries. Then it discusses the policy for the distribution of remote sensing data and demonstrates the applications of remote sensing data and products in China. Finally, it makes brief sugges-

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[1] Information Office of the State Council of the People's Republic of China, *China's Space Activities in 2006*, a White Paper (Oct. 12, 2006) *available at* http://www.cnsa.gov.cn/n615709/n620682/n639462/79381.html.