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Commercial Remote Sensing Licensing Program
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I. Executive Summary

Generally speaking, all national data policies and laws contain the same fundamental principles. They are: making data available for scientific, social, and economic benefit and restricting access to some data for national security reasons. Differences occur in application of variables: resolution limits, specific Nations that are denied access, etc. Regarding high-resolution commercial data, the trend is to meet national security priorities by making determinations for data requests on a case-by-case basis. The trend is moving away from applying general principles, like the nondiscriminatory access policy, to analyzing the specifics of each request. The analysis of each request itself has also trended away from considering what kind of data is being requested to who is requesting it, and why. In one potential and important case, the analysis is moving completely away from the data and requester to analyzing the sensitivity of the entire context of the transaction. The cumulative effect of these trends emphasizes national security interests over commercial interests and brings control of high-resolution satellites, data, and data products increasingly within the authority of national defense and licensing agencies via various legislative and policy mechanisms.

Formal law and policy is difficult to find due to differences in legal systems, language barriers, and the perceived importance or lack thereof, of the subject matter. However, there is a growing recognition of the need for more formal and transparent laws and policies. The body of law itself is growing. Globalization era issues, remote sensing activities, and access to affordable technology present practical problems and opportunities that are catalyzing remote sensing laws, in particular, and overall national space laws, in general. An increasingly common catalyst is disaster response, mitigation, and management.

The distinction between “public” and “private” in the remote sensing space segment is disappearing worldwide. What constitutes “commercial” operations varies among Nations.

The non-high resolution space-segment worldwide is mostly governmental, not private. A number of national funding entities are questioning the need for a space segment and they are increasing their demands to demonstrate the social and economic value of expensive space-based systems. To demonstrate value, some Nations are establishing State-owned entities organized like private corporations to conduct remote sensing activities. The difficulty in establishing system and data value is exacerbated by the tension between withholding data for national security purposes and making data available to increase its use, thereby demonstrating its economic and social value. In this new emerging era, ensuring survival of some existing systems and demonstrating the social and economic justification for all space-based systems is driving policy and law. The overall intent is to have an expanded user base within growing national security restrictions. Satellite operations are being

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1 There is no uniform definition of “high-resolution”. Depending on a Nation’s or company’s history and capabilities it can range from 5.8 meters to well under one meter.
permitted by whoever appears to have the ability to succeed, but the increasing tendency worldwide is for an operator to be some form of government entity.

II. Project Description

This project was undertaken by the National Center for Remote Sensing, Air, and Space Law (Center) and funded by the U.S. National Oceanic and Atmospheric Administration Satellite and Information Service’s Commercial Remote Sensing Licensing Program. This study reviews some of the laws and policies that address the commercialization and privatization of space-based remote sensing systems, data, and data products. It contains an analysis of some existing policies, and identifies some Nations that have been reported to be commencing space-based remote sensing activities but do not yet have formal laws and policies. It also identifies some global trends and includes a Nation-by-Nation synopsis of relevant laws and policies. The countries reviewed include Argentina, Australia, Austria, Belgium, Brazil, Canada, China, European Community, France, Germany, Hong Kong (special administrative region of China), India, Iran, Israel, Italy, Japan, Malaysia, Nigeria, Poland, the Russian Federation, South Africa, South Korea, Spain, Thailand, Turkey, Ukraine, the United Arab Emirates, the United States of America, and the United Kingdom.


III. Methodology

The core methodology for this study is formal legal research. It included a search on LEXIS/NEXIS and Westlaw, the most extensive legal databases. Research was conducted at the national and sub-unit levels (states, provinces, emirates, etc.) and sought legislative, regulatory, and case law.

This fundamental legal research was complemented by a full literature search of U.S. national, foreign national, and international law and policy materials. These included electronic and traditional hardcopy library sources. A major effort that focused on Internet sources was also conducted. A number of sources provided unofficial translations of legal materials in English.

Finally, where possible, interviews were conducted with government decisionmakers and industry participants. In some cases, information was gathered at professional international meetings and symposia. In other cases, specific visits were made to conduct in-person interviews and to directly observe remote sensing activities and policy processes. This approach was particularly

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fruitful as much of what is considered “policy” does not get published in formal publications and is made by rank and file officials on an “as needed” basis.

It must be stressed that this is not a market study. The trends and observations discussed in this report are those found in law and policy, not market research and economics. The author welcomes any additions and corrections and may be contacted at jgabryno@olemiss.edu.

IV. Acknowledgements

The author would like to thank the many, many people around the world that took time from their very busy professional lives to assist in gathering the information for this project. Like all research projects, not every source gets listed in a footnote; however, the sum of the project is the result of all of their contributions. Their support took many forms: providing access; documents; courtesy translations; interviews; contacts; travel assistance; and, most importantly, sharing their experiences, insights, and views of the subject. In this vein, it is worth noting that, as to be expected, different people from government, industry, and different countries often held different views. All agreed, however, this was a project that ought to be done; and, they looked forward to seeing as comprehensive a result as possible.

The author also wishes to acknowledge and thank the faculty and staff of the National Center for Remote Sensing, Air, and Space Law, and the University of Mississippi School of Law Library for their assistance and support. Particular thanks go to Mr. Michael Dodge and Ms. Melanie Walker who, as researchers, worked on this project and helped make it possible.

V. Analysis and Discussion

A. The Big Picture

Remote sensing law and policy can be divided into three eras, with a possibly emerging fourth era. The first era was from 1972 to 1983. It began with the launch of the United States’ Earth Resources Satellite 1, later renamed Landsat. There was only one policy, a United States national policy, and no formal law. The primary policy was the nondiscriminatory access policy, through which all data was made available to any one requesting it with the only stipulation being that the recipient also make the data available on a nondiscriminatory basis. The policy was driven by the Cold War foreign policy goals of influencing allies and nonaligned Nations by demonstrating technological superiority and encouraging them to use the data. Relevant satellites were government operated.

The second era was from 1984 to 1992. This era began with the attempted commercialization of the U.S. Landsat system and the advent of the

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French Satellite Probatoire d'Observation de la Terre, SPOT 1, and India's Indian Remote Sensing Satellite, IRS-IA. The U.S. passed its first Federal remote sensing statute. The policy in both France and the United States was driven by the desire to commercialize remote sensing. India also made the data commercially available internationally and stressed socio-economic development nationally. The French and Indian satellites were operated by governments, and in the U.S. by both government and private actors. All three countries subscribed to the nondiscriminatory access policy in some form. In the case of the United States, it was made part of the Federal remote sensing statute. All three funded the satellites through substantial subsidies resulting in a quasi-private environment. The ostensible user community was intended to be a commercial market but governments continued to be the largest users of remotely sensed data.

The third era was from 1992 to circa 2004. The era began with the United States' second Federal remote sensing statute, returning the Landsat system to the public sector; amending the law as it applied to private systems; and declassifying high-resolution satellite technology making it available for commercial and environmental applications. A number of Nations entered the remote sensing arena with space-based systems and policy and law were driven by commercial and environmental policies, and all continued to claim they practiced some form of nondiscriminatory access. For the second time, the United States incorporated it into its amended remote sensing statute and the policy was made part of a number of multilateral and bilateral agreements. Most of the data users were government entities that used the data for national security and environmental purposes. Satellites were operated by both private and government entities.

Around 2004, a number of events occurred that, taken together, caused and are still causing more shifts in the remote sensing legal and policy landscape. Among them were the conclusion of the Landsat Data Continuity Mission competitive process in the United States; the failed attempt to integrate a Landsat sensor on the National Polar-Orbiting Environmental Satellite System; activation of the Charter on Cooperation to Achieve the Coordinated Use of Space Facilities in the Event of Natural or Technological Disasters; growing interest in remote sensing satellite constellations; small satellite technology; and...
developing nations including Algeria, Columbia, Nigeria, and Turkey launching and operating remote sensing satellites, with others, like Malaysia and Thailand, planning to do so. In this new emerging era, ensuring survival of some existing systems and demonstrating the social and economic justification for all space-based systems is driving policy and law. The overall intent is to have an expanded user base within growing national security restrictions. Satellite operations are being permitted by whoever appears to have the ability to succeed, but the increasing tendency worldwide is for an operator to be some form of government entity. What follows is a discussion of some of the trends, laws, and policies that have begun in the recent past and that are continuing to occur now.

B. Current Trends

1. There is relatively little formal law, and there are more policies than laws, but the trend is to establish more formal law. Remote sensing applications are catalyzing both remote sensing-specific law and national space law.

Leading actors, like the United States and Canada, have formal, transparent remote sensing legal regimes. Nations do look to other Nations for precedent. For example, the new Canadian statute is based on the U.S. Land Remote Sensing Policy Act and a Canadian – U. S. treaty; however, it also has important distinctions based on Canadian national interests. Korea actively looked to U.S. law and other national laws in developing its own laws and policies. Chinese experts recommend doing the same. Germany is considering a two-tiered “security data policy” analogous to that codified by the

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13 Doo Hwan Kim, Korea’s Space Development Programme: Policy and Law, 22 Space Policy 110 at 112. (2005)

14 Yun Zhao, National Space Legislation, with Reference to China’s Practice, Proceedings, Asian Cooperation in Space Activities: A Common Approach to Legal Matters, 8, (2006) (on file with author). “Particular references should also be made to the existing national space legislations [sic] and successful experiences, especially those of the United States (US), which have been rather advanced and complete.”

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United States.\(^{15}\) A number of Nations, for example, Australia and Argentina, have general space laws and regulations that include remote sensing and data activities. At least one Nation, the United Arab Emirates has no space law or remote sensing law for space-based systems, but does have a federal law requiring authorization of “aerial photographic apparatus”.\(^{16}\) India also requires aerial remote sensing to be cleared by the defense authorities, but this is policy, not law.\(^{17}\) Some Nations, China, for example, have laws regarding activities related to remote sensing, like mapping.\(^{18}\)

Some Nations, like India, have overall, comprehensive policies.\(^{19}\) The current trend for many Nations, like Japan, however, is not to have overall, national policies but more typically to have policies on a satellite-by-satellite basis.\(^{20}\) Internal discussions can focus on parameters like who is requesting data and why. Absent national law, users and distributors fill the void and seek guidance on a daily basis with domestic, non-space, non-remote sensing regulations. For example, in Malaysia routine data distribution decisions are made according the Malaysian regulations for disaster response.\(^{21}\) In Nigeria, its 2003 National Geoinformation Policy and its Copyright Act have provisions “intended to protect intellectual property arising from the enhancement and dissemination of remotely sensed data.”\(^{22}\) And while India does not have a specific space law, “[S]pace-related matters in India are regulated by legal rules belonging to different areas of Indian domestic law…[and]…[t]he legal position of the space industry is largely determined by the Indian Constitution.”\(^{23}\)

In some Nations, there is no national law but the private law and the satellite operating licensing regulations of another country can govern a transaction. In Poland and the U.A.E., for example, contracts between the national data receiving entity and the foreign satellite data provider are the only legal bases for data distribution absent national laws and policies. In India, the committee that determines whether or not to grant a request for high resolution data does not address requests for 1-meter data or higher because it is


\(^{16}\) Federal Act No. 20 (1991) Promulgating the Civil Aviation Law.

\(^{17}\) Interview with V. Sundrararamaiah, Scientific Secretary, Indian Space Research Organization Headquarters, Bangalore, India, (August 7, 2006).


\(^{20}\) Interview with Yasushi Horikawa, Ph.D., Executive Director, JAXA (Aug. 18, 2006).

\(^{21}\) Instruction 20 for Disaster Response


controlled by the data provider’s contract.\textsuperscript{24} In these cases, private law and foreign regulation shapes national actions and policies, but is not a substitute for national laws.

A rising and rather robust trend is the increased participation by developing nations, newly space capable nations, and nations in alliances with spacefaring nations to develop national space laws that include remote sensing. Examples include Belgium\textsuperscript{25} and Nigeria\textsuperscript{26}. Even some long-established spacefarers without national legislation are considering, or have begun enacting national law to meet globalization era needs. France\textsuperscript{27}, Germany\textsuperscript{28}, India\textsuperscript{29}, and Japan\textsuperscript{30} are excellent examples of this. Informed opinion is also building for establishing space law in Nations that would seem like less likely candidates, for example, Iran.\textsuperscript{31}

A major catalyst for establishing space and remote sensing law is the availability of affordable satellite technology and small satellite missions. Austria, Colombia\textsuperscript{32}, Nigeria\textsuperscript{33}, Poland\textsuperscript{34}, and South Africa, among others, have, or are planning to have, small satellite missions that are creating a need for space and remote sensing law from the bottom up. In the case of Colombia, for example, it was a partner in a mission using a picosat for a university project. The other partner participants required Colombia to sign a document stating that the picosat was being used for “peaceful purposes,”\textsuperscript{35} an obligation under the \textit{Treaty on Principles Governing The Activities of States in the Exploration and Use of Outer Space, Including The Moon and Other Celestial Bodies (Outer Space Treaty)}.\textsuperscript{36} This led to an internal Colombian government assessment as to

\begin{itemize}
\item \textsuperscript{24} There were conflicting views on this point. This statement was opted for in this report based on the research as a whole. It may be revised at a later date.
\item \textsuperscript{25} Law on the Activities of Launching, Flight Operations or Guidance of Space Objects available at \url{http://www.belspo.be/belspo/res/rech/spatres/loispat_en.stm} (last visited December 14, 2006).
\item \textsuperscript{27} Telephone interview with Marco Ferrazzani, Head of Office for Programme Matters, Legal Department, European Space Agency (Dec. 22, 2006).
\item \textsuperscript{28} \textit{Supra} note 15.
\item \textsuperscript{29} Staff Writers, \textit{Enact Space Law To Govern Use Of Remote Sensing Data}, Spacemart, November 23, 2006 available at \url{http://www.spacemart.com/reports/Enact_Space_Law_To_Govern_Use_Of_Remote_Sensing_Data_999.html} (last visited December 14, 2006).
\item \textsuperscript{30} Telephone interview with Marco Ferrazzani, Head of Office for Programme Matters, Legal Department, European Space Agency (Dec. 22, 2006).
\item \textsuperscript{31} Interview with Prof. Kazuto Suzuki, University of Tsukuba, (August 17, 2006).
\item \textsuperscript{32} E-mail from Juan Carlos Narvaez Gomez, Msc. Satellite Based Communication, Navigation and Surveillance, Civil Aviation of Colombia, Focal Point Fourth Space Conference for the Americas (Viernes, 03 de Febrero de 2006 09:52 a.m.) (on file with author).
\item \textsuperscript{33} Brisibe, supra note 26.
\item \textsuperscript{35} \textit{Supra}, note 32.
\item \textsuperscript{36} Jan. 27, 1967, 18 U.S.T. 2410, 610 U.N.T.S. 205.
\end{itemize}
whether recognizing the treaty principle would be consistent with Colombian national law.\textsuperscript{37} In the case of Nigeria\textsuperscript{38}, its small remote sensing satellite led to the decision to ratify the Outer Space Treaty and the \textit{Convention on International Liability for Damage Caused by Space Objects (Liability Convention)}\textsuperscript{39}. Over time, it can be expected that these growing activities will influence emerging laws, policies, and State practice.\textsuperscript{40}

Part of the trend to establish new national space law includes aggressive space law capacity building.\textsuperscript{41} This, plus the increased questioning by, and the desire of, decisionmakers and other actors for guidance, portends a dynamic future for remote sensing law, regulation, and policy.

2. Transparency of laws and policies is relatively rare, but improving slightly.

For the purposes of this study, “transparency” is defined as legal, regulatory, and policy materials being readily accessible in official sources like published legal codes, regulations, and policies. On the open end of the spectrum is the United States and Canada whose non-classified laws and policies are available in published national legal codes and on numerous Internet sites.\textsuperscript{42} This kind of transparency is relatively rare for a number of reasons, including differences among legal systems. Also important are cultural attitudes toward the availability of information and privacy. Some developing countries view transparency as a “weapon” of some developed nations, for example. Language is another important factor. Although English is the accepted language of aerospace activities, not all remote sensing related laws and policies are routinely translated into English.\textsuperscript{43}

\textsuperscript{37} Supra, note 32.
\textsuperscript{38} Brisibe, \textit{supra} note 26.
\textsuperscript{41} Since 2002, space law capacity building workshops have been held in The Hague, Netherlands; Daejon, Republic of Korea; Rio de Janeiro, Brazil; Abuja, Nigeria; and, Kyiv, Ukraine. See, \url{http://www.unoosa.org/oosa/en/SpaceLaw/workshops/index.html}, (last visited December 17, 2006).
\textsuperscript{43} One example is Japan’s Long-Term Plan of Space Development. While parts have been translated, the policy as a whole has not. This is in part, because the policy is being reviewed in light of the merger between ISIS and NASDA (on file with author). Another potential example is the proposed German remote sensing legislation. As of this writing, there are no official plans to provide an official translation of the proposed legislation if passed.
The trend is toward a slight improvement in transparency of remote sensing laws and policies. This is being catalyzed by the Internet, increased academic inquiry, active space law capacity building, and, in some cases, a growing need to coordinate policies for economics and efficiency.

3. **Access to data is the presumed norm with exceptions for national security; the number and kind of exceptions are growing; the UN Principles on Remote Sensing are being more narrowly construed.**

All space-based, non-military remote sensing activities are based on the starting presumption that data is to be made available, particularly to sensed states, on a nondiscriminatory basis and that data is to be as openly available as much as possible. Data denial is the exception, not the rule. Only one system promotes its products on the basis of “exclusivity” and “secrecy”. Regarding high-resolution data, however, the number of exceptions to the nondiscriminatory access policy is growing in Canada, Europe (Germany, France, and Italy), and the latter has conducted research into national space legislation of different nations.

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44 Deserving of particular mention is the United Nations Office of Outer Space Affairs whose ever-growing website has become an important source for space law. Available at http://www.unoosa.org/oosa/en/SpaceLaw/index.html

45 In addition to the work of the National Center for Remote Sensing, Air, and Space Law at the University of Mississippi in the United States, the work of the International Center for Space Law in Ukraine and the International Institute of Air and Space Law at Leiden University deserves noting. The former has published a number of national space laws in English and Russian, and the latter has conducted research into national space legislation of different nations.

46 Since 2002, space law capacity building workshops have been held in The Hague, Netherlands; Daejon, Republic of Korea; Rio de Janeiro, Brazil; Abuja, Nigeria; and Kyiv, Ukraine. See, http://www.unoosa.org/oosa/en/SpaceLaw/workshops/index.html, (last visited December 17, 2006).


49 Remote Sensing Space Systems Act 2005, OPERATION OF REMOTE SENSING SPACE SYSTEMS, Applications, Licences and Related Matters, “8. (7) In a licence, the Minister may restrict the provision of remote sensing products or classes of such products from the licensed system to persons or classes of persons other than the licensee or system participants on any conditions that the Minister considers appropriate. The conditions may include requirements that, in specified cases or circumstances, the provision of the remote sensing products

   (a) be subject to the Minister’s prior approval; or

   (b) be done only under a legally enforceable agreement, entered into in good faith, that includes measures respecting their security or their further provision”.


50 Interview with Wolfgang Schneider, Federal Ministry of Economics and Technology, (if proposed law passes, it will have no reference to the UN Remote Sensing Principles and non-discriminatory access) (November 30, 2006).

51 Turin Agreement, supra, note 47. “Art. V.(e) Use of products of the Defence Ministries
India, Israel, and the United States, among others. Recent and pending

Products generated to meet specific Defence Ministry requirements may be placed at the
disposal of commercial or private users, after having been subjected to a process of degradation
and declassification, in accordance with the joint rules on the use of data which form the subject
of a specific agreement.”

ISRO:EOS:POLICY-01:2001 Indian Space Research Organisation Hq  Bangalore-560 094

“1. For operating a remote sensing satellite from India, license and/or permission of the
Government, through the nodal agency, will be necessary. […]
c. Government reserves the right to impose control over imaging tasks and distribution of
data from IRS or any other Indian remote sensing satellite when it is of the opinion that
national security and/or international obligations and/or foreign policies of the
Government so require. Policy restricting anything less than 2.5m” […]

4. Government prescribes the following guidelines to be adopted for dissemination of satellite
remote sensing data in India:

   a. All data of resolutions up to 5.8 m shall be distributed on a non-discriminatory basis
      and on “as requested basis”

   b. With a view to protect national security interests, all data of 5.8 m and better than 5.8
      m resolution images will be screened by the appropriate agency before distribution so
      that images of sensitive areas are excluded.

   i. Data of 5.8m and up to 1m resolution can be distributed to users after screening
      and ensuring the sensitive areas are excluded.

   ii Data of 1m resolution and better will also be screened as above and the following
      procedure will be followed for its distribution
      1. Government users can obtain the data without any further clearance.
      2. Private sector agencies, recommended by at least one Government agency for
         use of 1m and better resolution data for supporting development activities, can
         obtain it without any further clearance.
      3. Other Private, Foreign and other users can obtain the data after further
         clearance from an inter-agency High Resolution Image Clearance Committee
         (HRC).
      4. Specific requests for data of sensitive areas, by any user, can be distributed
         only after obtaining clearance from HRC.

5. Specific sale/non-disclosure agreements to be concluded between NRSA and users
for data of 1 m resolution and better.

Imagesat International, “Through the unique SOP and EPOD programs, Customers acquire a
completely autonomous, secret, regional high-resolution imaging capability.”

(a) Disclosure Prohibited.--Land remote sensing information may not be disclosed under
section 552 of title 5, United States Code.
(b) Land Remote Sensing Information Defined.--In this section, the term "land remote sensing
information"--
   (1) means any data that--
      (A) are collected by land remote sensing; and
      (B) are prohibited from sale to customers other than the United States Government and
      (2) includes any imagery and other product that is derived from such data.
(c) State or Local Government Disclosures.--Land remote sensing information provided by the
head of a department or agency of the United States to a State or local...
legislation demonstrate that national security interests are being made a priority over general data access. The proposed German legislation “tends to support commercialization” but recognizes that the legislation’s purpose is “the necessity of safeguarding security and foreign policy interests [and this] guides the contents of the regulations of the draft legislation”.\(^{55}\) Governments are engaging in what is more correctly characterized as “controlled access”, rather than “restricted access” and are construing the \emph{U.N. Principles Relating to Remote Sensing of the Earth from Outer Space}\(^{56}\) more narrowly. For example, the new Canadian legislation specifically contends that a sensed State’s right to data of its territory is limited to data used for resource management purposes.\(^{57}\) Regarding the proposed German legislation and the U.N. Principles, “[b]y interpreting the terms ‘non-discriminatory’ and ‘reasonable’ or by imposing security aspects prevail [sic] on Principle[ ] XII distributions, the legislating State can restrict the access of the sensed State to data of its own territory due to security or foreign policy interests”.\(^{58}\) In some cases making exceptions to data access has given way to intentionally establishing dual use policies for dual use systems. The formal definition of “dual use” used by Italy and France is a “satellite observation system developed...for military and civil use (institutional and commercial)...”\(^{59}\) The data policy flowing from this definition allows for “direct access to the satellites” by defense entities and all other users, including commercial. They must go through a civilian operator who has an exclusive worldwide license. Allocation of all system resources, including data, is 40% for institutional bodies of cooperating countries and less than 10% for defense.\(^{60}\)

All current and pending national legislation and policy provide for some form of “shutter control”. That is, Government-authorized mechanisms to interrupt, withhold, or prevent data access. The means are increasingly varied and growing.

Nonetheless, regardless of actual practice, no Nation or data supplier wants to appear to denounce the nondiscriminatory access policy and the \emph{U.N. government may not be made available to the general public under any State or local law relating to the disclosure of information or records.}

\begin{itemize}
  \item[(d)] \emph{Safeguarding Information.--The head of each department or agency of the United States having land remote sensing information within that department or agency or providing such information to a State or local government shall take such actions, commensurate with the sensitivity of that information, as are necessary to protect that information from disclosure prohibited under this section.}
  \item[(e)] \emph{Other Definitions.--In this section, the terms "land remote sensing" and "United States Government and its affiliated users" have the meanings given such terms in section 3 of such Act (15 U.S.C. 5602).}
\end{itemize}

\(^{55}\) Gerhard et al., \emph{supra} note 15, at 2.

\(^{56}\) Principles Relating to Remote Sensing of the Earth from Outer Space (resolution 41/65 of 3 December 1986

\(^{57}\) Mann, \emph{supra} note 12, at 7.

\(^{58}\) Gerhard, et al., \emph{supra} note 15, at 6.

\(^{59}\) Turin Agreement, \emph{supra} note 47, at Art. 1 (e).

Even a provider that promotes “exclusivity”, “autonomy”, and “secrecy” in marketing its system and data, when asked in a public forum, stated that it abides by nondiscriminatory access. In this sense, expressed opinion continues to assert a presumption of data openness and availability. These assertions, however, must be considered in the context of changing and emerging State practice.

4. **Shifts: from “commercialization” to use; from focusing on data to focusing on users, to focusing on the context of transactions; from profits to becoming operational. There is a steadily increasing interest in disaster response, mitigation, and management.**

In terms of policy goals, there is a shift occurring from the need or desire to “commercialize” satellites to the need and desire to increase the use of data. The growing demand of national funding authorities and legislatures to demonstrate the economic or social value of the satellites is driving this shift. In the era of globalization, the economic and social value of expenditures is becoming as important as the Cold War value of establishing national prestige through technological and commercial superiority. As a result, a concomitant shift is also occurring from focusing on the kind of data being sought, to whom is using it. There is less discussion about “raw data”, “metadata”, etc., and more discussion about “who” uses the data and “why”. Asking who is using the data and why, is also increasing in a number of Nations for national security reasons as well as for commercial reasons. In the case of Germany’s proposed legislation, the shift is anticipated to go even further. If passed, the proposed German law would move the inquiry completely away from the kind of data being

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61 Supra, note 56.


63 See the next section for a discussion regarding the definition of this term.


65 Resolution on the Commission Communication to the Council and the European Parliament “The European Union and Space: fostering applications, markets and industrial competitiveness”. (COM(96)0617-C4-0042/97), (1998). This is one resolution that demonstrates the point: “…the growth in the commercial market, although important, must not be allowed to hide the fall in the public investment required for the development of this sector in order to guarantee technological progress…[and]…Stresses the need for a European policy to promote the use of Earth observation data by establishing infrastructure and services which the private sector cannot finance…Emphasizes the need to enhance technological skills and financial capacities in the civilian space sector, more particularly in the field of satellite observation, being aware that the private sector is not able to finance all the European infrastructure required…Resolution on the Commission Communication to the Council and the European Parliament “The European Union and Space: fostering applications, markets and industrial competitiveness”.

requested, that is, how sensitive it is, to the sensitivity of the entire transaction. That inquiry will require the data distributor to analyze not only "who" and "why" but the entire context of the transaction including geopolitical factors that will be on a precise check list, a "geomatrix" provided by the government.67

Finally, reflecting the trends to stress data use and data users, both the ground segment and space segment participants are focusing more on becoming operational68 for the long-term and less on generating near-term profits. A steadily growing part of this trend is disaster response, mitigation, and management.

5. "Public" and "Private" are increasingly difficult to distinguish.

Specific legal constructs depend on national law. "Private" can have different definitions in different Nation-States. "Commercial" has different definitions in different Nation-States. In Europe, for example, the term "commercial" means to generate revenue, and it applies to any entity that does so, regardless of by whom.69 In the U.S., the term "commercial" means a private sector activity, and in general, is not applied to government activities. The recently passed Canadian remote sensing law highlights the increasing difficulty in distinguishing what "commercial" means by requiring both government agencies and companies to obtain operating licenses.70 This was done precisely "because of the difficulty and uncertainty in attempting to confine the application of the legislation to commercial satellites".71

Regardless of the definition used, often the policy implications are the same. For example, some sensed States are concerned whether or not it is a public or private entity that is collecting imagery of its territory or selling it to an adversary. However, the correct applications of some policies and law do depend upon a distinction, such as the nondiscriminatory data access policy and various pricing policies.

The close relationships between revenue-generating remote sensing space systems—regardless of public or private designation—and their nations of origin; the high degree of direct or indirect subsidies; and targeted contractual funding appear to be creating hybrid entities worldwide that increasingly embody

67 Schneider, supra note 50; Gerhard et al, supra note 15.
68 Turin Agreement, supra note 47, at Art. II. ("The aim of this system, together with other military and civil systems, is to satisfy the operational programme specifications…").
69 Frans von der Dunk, The Moon Agreement and the Prospect of Commercial Exploitation of Lunar Resources 32 Annals of Air and Space Law (2007). (in press. on file with author). "It is important here to define certain relevant terms, since in particular US authors tend to use the term "commercial" where the European authors would use the term 'private’...[which] refers to the (legal) classification of an actor (as opposed to 'public', comprising governments, governmental agencies and intergovernmental organisations) undertaking a space activity, 'commercial' refers to the main driving factor behind, and overarching objective of, such an activity, and hence is to be contrasted to such other objectives as military or scientific purposes. Thus, governments or other public entities may also undertake commercial activities in outer space."
71 Mann, supra, note 12, at 4.
elements of both public and private institutions. In fact, the trend in both the space segment and the ground segment of remote sensing activities is toward “public-private partnerships”\footnote{Communication From The Commission To The Council And The European Parliament European Space Policy - Preliminary Elements, (SEC(2005)664), Brussels, 23.05.2005 COM(2005) 208 final. (“In particular, risk sharing public private partnerships will be explored wherever possible.”)}, a term that has no uniform definition but usually implies risk sharing\footnote{Infoterra, “DLR, and...EADS Astrium GmbH have agreed to jointly bear the costs of constructing and implementing” re: TerraSAR-X, Germany’s first public-private satellite partnership. \url{http://www.terrasar.de/en/imp/hist/index.php}}.

6. **Government ground segment trend is to decrease data distribution cost, moving to free.**

Some of the most prominent actors in this trend are Australia, Europe, Japan, and the United States. In the U.S., the Government has dramatically decreased the cost of *Landsat* data and intends to continue to do so\footnote{U.S. Department of Interior/U.S. Geological Survey, \textit{available at} \url{http://landsat.usgs.gov/data_products/slc_off_data_products/slc_off_data_prices.php}}. In Australia, GeoScience Australia provides data free on the Internet and sells it on CDs.\footnote{Australian Government, Geoscience Australia, \textit{available at} \url{http://www.ga.gov.au/news/}} Originally the distribution of data by public agencies was based on profit motive.\footnote{Free of Fee: The Governmental Data Ownership Debate, GITA White Paper, Aug. 2005.} In both the U.S. and Australia, a shift toward just recouping costs resulted in increased data use. Japan asserts that public data users should access data at “almost no charge” on networks.\footnote{Space Activities Commission, Japan’s Earth Observation Satellite Development Plan and Data Utilization Strategy, (2005). (on file with author).} The European Space Agency has also been reported to be considering making data free.\footnote{Peter B. de Selding, \textit{ESA Policy Change Would Make Earth Observation Data Free}, Space News, April 8, 2003, \textit{available at} \url{http://www.space.com/spacenews/archive03/esaarch_040703.html}}

7. **The space segment is more government, less private**

High-resolution “commercial” remote sensing space systems, however “commercial” is defined, overwhelmingly serve national security activities, a governmental function. Environmental monitoring; disaster response and mitigation; and, land change detection are growing uses of satellites, and these too, are more governmental activities. Additionally, even where “public - private” partnerships exist, satellite ownership is often retained by national Governments, as in Japan\footnote{Masami Onoda, \textit{Commercial Remote Sensing in Japan}, (June 28,2006) (on file with author).} and Germany.\footnote{Gerhard et al., \textit{supra} note 15, at 7.}

8. **State-owned entities organized like private corporations.**
In space-based remote sensing there have been attempts at both privatization and commercialization. A newer and different trend is emerging: State-owned entities organized like private corporations. This approach has been used for other assets including railroads, highways, electricity, and water. It is new to space-based remote sensing. In India, Japan, Thailand, and Turkey, for example, corporate entities have been established with government funds. In Thailand, the Geo-Informatics and Space Technology Development Agency (GITSDA) is a new “public organization”. It is government-funded, performs functions that government organizations do and is permitted to compete with both government and private entities. In some ways, these entities are not required to follow established government rules and procedures. They have the authority to set their own processes and procedures and they usually have government representation on their governing boards. In Malaysia, it is the desire of some of the remote sensing leadership to corporatize in order to expand its consulting services. Variations of this approach can be seen in the original Intelsat and Comsat models; the older European postal-telephone and telegraph (PTT) models; and to some extent in the U.S. Post Office model, which is a form of a government corporation. Another variation of this trend is authorizing government entities to participate in both public and private activities, as in Argentina.

The drivers for the new remote sensing organizations are pursuit of efficiency and flexibility, and human resource capacity building. While it is a subject of debate as to the relative efficiency of the public and private sectors,
the primary difference between them is that a private company can go bankrupt. That is unlikely with a government enterprise. In some nations the idea of providing government employees with experience by running a company appears to be an unusual approach. Developing human resources, however, is an important part of the system in Thailand, Turkey, and Malaysia, for example. Overall, there is uncertainty regarding the roles and processes of these emerging organizations. The nature of these entities can raise the question of if, and to what degree, they have the competency to legally bind their Nation-State of origin.

V. Some specific evolving, dynamic cases.

A. Japan: Possible major changes?

Japan is addressed in this study because it is an important remote sensing nation that may soon be undergoing historic changes in its national law, practices, and policies. It is among those Nations that have a corporate-like entity performing government-like functions. The Japan Aerospace Exploration Agency (JAXA) is an independent administrative public corporation.\textsuperscript{92} JAXA employees are not civil servants and they have contracts and unions. Unlike JAXA’s predecessor, NASDA, JAXA has the new objective of promoting space development and use. Promotion includes dissemination of data and results, which, in turn, includes remotely sensed data.\textsuperscript{93}

Currently, Japan has no formalized, detailed data policy for each satellite. The guidelines of the Space Activities Commission are applied to JAXA.\textsuperscript{94} As of August 2006, decisionmakers were considering what policy, or policies, ought to be formulated. In principle, all data is available to the public without regard to a specific spatial resolution limit.\textsuperscript{95} Data access is determined on a satellite-by-satellite basis. Decisionmakers can have internal discussions and ask who is requesting data and why. Policy priorities include establishing rules for processed data; solving issues pertaining to providing Earth observation data; and encouraging data use.\textsuperscript{96} All data can be used only for peaceful purposes and JAXA retains intellectual property rights.\textsuperscript{97}

Users are divided into three categories: public data users, all others, and national security users. Public users include those that contribute to promotion of data utilization. For them, data is available at the cost of reproduction and should be “almost no charge”\textsuperscript{98} on networks. Other data users include commercial users.

\textsuperscript{92} Supra, note 79.
\textsuperscript{93} Law Concerning Japan Aerospace Exploration Agency, Law No. 161 of 2002, art. 18. 1. (5) (“Dissemination of the activities referred to in each of the preceding Items, and promotion of utilization thereof.”) available at \url{www.jaxa.jp/about/gaiyo/law/law_e.pdf}
\textsuperscript{95} Interview, supra, note 20.
\textsuperscript{96} JAXA, supra, note 94.
\textsuperscript{97} Id.
\textsuperscript{98} JAXA, supra, note 94.
who can be offered a low price but not less than prices offered by private companies. National security data is classified and comes from Japan’s Information Gathering Satellite (IGS).

The most important pending change in Japanese remote sensing law is the Japanese Draft Basic Law on Space Development. As of August 2006, the draft was still in development and was expected to be formally proposed in 2007, although it could also be proposed as early as 2006. The draft consists of a preamble and 38 articles. Copies have not yet been made officially available and some changes are still possible. The process in preparing and proposing the draft appears to be an abbreviated one and it could change based on politics. The Liberal Democratic Party is leading the law-making effort. At the same time, there is growing interest by the Ministry of Foreign Affairs to use space technology as a diplomatic tool. This is being driven by China’s success in human space flight and using it in Chinese diplomacy.

The legal drivers of the Japanese Draft Basic Law on Space Development is the historical Japanese definition of “peaceful purposes” and the Japanese Constitution’s prohibition against a standing military. A Diet Resolution defines “peaceful purposes” to mean “non-military” rather than “non-aggressive”. This is being reconsidered in light of recent North Korean space activities.

Another driver of the draft law is a 1990 Japan - U.S. trade accord that requires non-research and development satellites to be openly procured in a transparent way. This has resulted in the U.S. winning 18 out of 19 Japanese satellite contracts. The draft law is not intended to override the accord and it is expected that the accord will be renegotiated.

Procurement of the Information Gathering Satellite (IGS) was not open to international vendors due to its national security mission. The Japanese Draft Basic Law on Space Development is intended to continue to ensure that future procurements can be done this way, too. It is intended to promote research and development, support Japanese industry, and enhance national security. A private finance initiative is part of the draft law. It would allow private sector entities to procure satellites with private funds while the government would provide user fees to a company as an anchor tenant. It is intended to be similar to arrangements between the United States Government and its U.S.-licensed companies. There is some informed internal opinion that, due to fiscal constraints, this approach is unlikely unless it becomes part of future classified Information Gathering Satellites. Data policy will be discussed in the future.

B. India: Early recognition of societal value

India is addressed in this study because it is an important remote sensing nation and has its remote sensing policy roots in providing socio-economic benefit, an aspect of remote sensing that other Nations are also now being required to demonstrate. National security and foreign policy are also prime

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considerations in Indian policy.\textsuperscript{100} The Indian Parliament approved and adopted a comprehensive Remote Sensing Data Policy (RSDP) for the acquisition and distribution of satellite remote sensing data.\textsuperscript{101} India has a comprehensive remote sensing national policy, yet no national law.\textsuperscript{102} Pressure is growing, however, to establish national law.\textsuperscript{103} The political environment includes the forces among individual Indian states with important remote sensing institutions and national political forces.

Satellite data and imagery are considered a “public good” in India.\textsuperscript{104} Attempts are being made to liberalize data policies to encourage more data use.\textsuperscript{105} The term is used as the economic term of art that means one cannot be excluded from using a particular good.\textsuperscript{106} It is also more commonly used as a social term, that is, remotely sensed data is good for the public. Here, data as public good is intended to “support national development, knowledge and commerce” and the government owns the data.\textsuperscript{107} This view was first expressed by Vikram Sarabhai, a founder of India’s space program, “We are convinced that if we are to play a meaningful role nationally, and in the community of nations, we must be second to none in the application of advanced technologies to the real problems of man and society”.\textsuperscript{108} The result is a focus on user needs and applications from the beginning. Return on investment is documented for each round of funding and a Cabinet level committee makes satellite design and use decisions.\textsuperscript{109}

All data up to 5.8 meters is available on a nondiscriminatory basis. Higher-resolution data is theoretically available on a case-by-case basis.\textsuperscript{110} Dissemination should not be “unreasonably” controlled.\textsuperscript{111} The 5.8 limit is an historical artifact based on India’s early remote sensing capabilities. An interagency high-resolution committee was established as a mechanism to allow the release of high-resolution data. The committee does not make determinations regarding 1-meter or higher data that is provided by foreign commercial companies.\textsuperscript{112} Contract terms govern this distribution.

The Committee was initially envisioned to allow release of more data. However, in practice, it appears to work more in the opposite manner. There is

\textsuperscript{100} Indian Space Agency, \textit{Indian Space Programme and Its Legal Dimensions} presentation at Headquarters, Bangalore, India, July 8, 2006 (on file with author).
\textsuperscript{101} ISRO, supra note 52.
\textsuperscript{102} Rao, et al., supra note 19, at 47 – 61.
\textsuperscript{103} Mani et al, supra note 23, at 132.
\textsuperscript{104} ISRO, supra note 52
\textsuperscript{105} Interview with V. Sundrararamaiah, Scientific Secretary, Indian Space Research Organization Headquarters, Bangalore, India, (August 7, 2006).
\textsuperscript{106} Rao, et al, supra note 19, at 51 – 52.
\textsuperscript{107} “Indian Space Programme and Its Legal Dimensions” presentation by the Indian Space Research Organization at Headquarters, Bangalore, India, July 8, 2006.
\textsuperscript{109} Interview, Dr. K. Kasturirangan, Member of Parliament, New Delhi, India, (Aug. 10, 2006).
\textsuperscript{110} ISRO, supra note 52.
\textsuperscript{111} ISRO, supra note 100.
\textsuperscript{112} Supra note 24.
pressure from India’s remote sensing industry and data users to liberalize the high-resolution policy so that data will be more widely used and to compete in the international remote sensing marketplace, and particularly with the United States. The response from India’s national security community is that the U.S. has vast oceans and friends, not enemies, on its borders. As of July 2006, it was unclear what the data policy would be for Cartosat 2-meter data. Internal discussions are continuing along the lines of competitiveness versus national security.

India’s legal, policy, and remote sensing communities are passionate in their view that Google Earth, Microsoft Virtual Earth, and other web-based image suppliers must be regulated. Some in the Indian legal community hold the opinion that these suppliers are in violation of international law and are engaging in relevant research to demonstrate this. These views reflect the philosophy of the current national remote sensing policy that “has safeguards for ensuring that images of sensitive areas are screened out…”

C. Israel: Anomaly or Adherent?

Israel is addressed in this study because it provides an opportunity to consider remote sensing law, policy and State practice in a global context. It is an important remote sensing nation and unlike other remote sensing nations, the company that operates from Israel openly promotes exclusivity and secrecy as its starting premise for commercial remote sensing products and services. It also advertises these qualities as a premium service. Customers “acquire a completely autonomous, secret, regional high-resolution imaging capability” and they “may choose to acquire all or some of their...imagery on an exclusive basis.” In some arrangements “acquired imagery is not recorded or stored on the satellite and cannot be downloaded to any other ground station.” These terms apparently can exclude a sensed State from gaining access to data of its territory contrary to the U.N. Principles. There are multiple data distribution policies based on who the customer is and the contractual agreement between the company and client.

The policies that govern the company that operates from Israel explicitly recognize the fact that the overwhelming majority of the high-resolution space-based capabilities market consists of governments and organizations without their own indigenous surveillance satellites. Policies and laws of other Nations

113 ISRO, supra note 52.
114 The company that operates out of Israel describes itself as an “international company” and has a minimal corporate presence in Netherlands Antilles and Cyprus. However, a cursory “piercing of the corporate veil” readily reveals the company’s history and operations identify it with Israel and bring it within Israeli competence.
115 http://www.imagesatintl.com/default.asp?catid={058FFC84-67B4-4996-AB67-C0BCA4FE4F85}
117 http://www.imagesatintl.com/default.asp?catid={C430687B-FB8B-4CCC-B3B9-EDC528B0D044}
118 Art. XII.
recognize this fact implicitly, and secrecy and exclusivity are incrementally implemented by various mechanisms, such as placing data into access tiers, degrading images, and making a distinction between environmental and non-environmental data.

Therefore, the difference between the Israeli model and those of other Nations raises a question of whether the differences are more a matter of degree or of kind. On a spectrum with full nondiscriminatory access at one end and complete exclusivity on the other, the question becomes where on the spectrum is the point passed that, according to the international remote sensing community, required data access moves into reasonable national security constraints and then goes on to become impermissible data denial? One major criterion in such an analysis would be if a relevant law or policy expresses the intention of eventual openness. For example, regarding the Pleiades system, Italy and France “agree to jointly study and develop procedures for degrading classified images, with a view to lowering their level of classification”; and, the Afghan imagery obtained pursuant to an exclusive SpacelImaging – U.S. Government contract for Afghan imagery was eventually released for public purchase.

VII. CONCLUSION

Worldwide, commercial (whether public, private or hybrid) high-resolution remote sensing is increasingly being organized and institutionalized through law and policy to meet national security concerns. Data distribution policies are changing to reflect this. While there are some notable differences from Nation to Nation, the general principles, overall trends, and practices are similar for developed, developing, and newly active space nations. National space law is on the rise, catalyzed in large part by the practical issues raised by commercial remote sensing activities.

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119 US and proposed German Law
120 Turin Agreement, supra, note 47, at, Art. V.
121 Germany and Canada
122 Turin Agreement, supra note 47 V. 2.
123 Joanne Irene Gabrynowicz, “A Case of First Impression: the US Government-SpacelImaging Contract for Afghan Imagery,” IAF abstracts, 34th COSPAR Scientific Assembly, The Second World Space Congress, held 10-19 October, 2002 in Houston, TX, USA., p.IISL-3-23IAF abstracts, 34th COSPAR Scientific Assembly,
VIII. Charts

A. The Big Picture

The Big Picture
Land Data Distribution Policies


Why
Foreign policy Commercial policy "Commercial" and environmental policy

To
Allies and nonaligned nations Commercial market National security and environmental users

By
Government Quasi-private "Private" and Government

The Big Picture
Distribution Policies and Rationales

~ 2004 - Present

Why
Survival of, and economic justification for, space systems

To
As expanded a user base as possible within growing national security restrictions

By
By whomever can succeed, but increasing tendency to be some form of government world-wide.
B. Nation-by-Nation synopsis of relevant current and pending laws and policies

<table>
<thead>
<tr>
<th>Country</th>
<th>National Space and/or Remote Sensing Law</th>
<th>Relevant Regulations, Policies, and Some Other Related Laws</th>
<th>Data Policy</th>
</tr>
</thead>
</table>
| Argentina | Creation of the National Commission on Space Activities, National Decree No. 955/91  
Establishment of the National registry of Objects Launched into Outer Space, National Decree,125/95 | None | National Commission of Space Activities data distribution policy allows for free and open access of data, catalyzed by the Nation’s interest in prevention and preparedness for future disasters. Can engage in commercial activities and distribute data accordingly. |
| Austria | None | None | None |
| Belgium | Law on the Activities of Launching, Flight Operations or Guidance of Space Objects | In progress | In progress |
| Brazil | Law No. 8.854 of 10 February 1984 (Established the Brazilian Space Agency)  
Resolution on Commercial Launching Activities from Brazilian Territories, Resolution No. 51, Jan. 26, 2001  
Resolution on procedures and on definition of necessary requirements for the request, evaluation, issuance, follow-up, and supervision of licenses for carrying out launching activities | Portaria AEB (Administrative Edict), No. 27, Regulation on procedures and on definition of necessary requirements for the request, evaluation, issuance, follow-up, and supervision of licenses for carrying out launching space activities on Brazilian Territory. | Summary: Currently under CBERS agreement, open access but possible movement to adopt other policies. Data downlinks licensed based on per-minute fee basis. China and Brazil may agree in a few special cases to transfer data free. Now includes Mozambique, Angola, and some other African countries. CRESDA and Brazilian ground stations have unlimited access. Distributors are licensed. Independent price list for distribution solely within national market. Can not be exported abroad. INPE and CRESDA set international prices.  
General Considerations: The downlink data is |
space activities on Brazilian territory, Administrative Edict No. 27, June 20, 2001


For the Government of the Federative Republic of Brazil for the Government of the People’s Republic of China CBERS Data Policy

<table>
<thead>
<tr>
<th>Licensing Policy For International Ground Stations</th>
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</thead>
<tbody>
<tr>
<td>(a) CBERS data reception, processing and distribution to other countries will be carried out by licensed representatives jointly appointed by CRESDA and INPE.</td>
</tr>
<tr>
<td>(b) The licensed representative will commercialize CBERS data downlink to ground stations on a annual fixed basis, based on a fee determined by INPE and CRESDA. The annual fee will be determined by the conditions of the ground stations, including geographical location and antenna footprint.</td>
</tr>
</tbody>
</table>

Product Distribution Policy
The commercial agreement between licensed
<table>
<thead>
<tr>
<th>Country</th>
<th>Relevant Legislation</th>
</tr>
</thead>
</table>

- Department of Industry Act
- Department of Foreign Affairs and International Trade Act
- National Defence Act
- Canadian Charter of Rights and Freedoms, Article 1
- Personal Information and Electronic Documents Act
- Access to Information Act

Incorporates all aspects of Canadian Access Control policy. Availability in accord with UN Remote Sensing Principles. Sensed states only automatically given access to data for improving natural resources management.

**License Conditions:**
Raw data and remote sensing products from the system about the territory of any country—but not including data or products that have been enhanced or to which some value has been added—be made available to the government of that country within a reasonable time, on reasonable terms and for so long as the data or products have not been disposed of.

**Priority access:**
Minister of Foreign Affairs may order if there are reasonable grounds that continued operations would be injurious to international relations inconsistent with international obligations

Minister of Defence may order if there are representatives and distributors shall include the following:
(a) The right of receiving, processing and distributing CBERS data shall be granted to the distributor by the licensed representative.
(b) Each distributor could set its native price list independently for distribution solely within its respective national market. Images distributed within the distributor's national market may not be exported abroad.
(g) When distributing abroad, the distributor must refer to the international price list set by INPE and CRESDA.
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<td>For the Government of the Federative Republic of Brazil For the Government of the People’s Republic of China CBERS Data Policy</td>
<td>For the Government of the Federative Republic of Brazil For the Government of the People’s Republic of China CBERS Data Policy</td>
<td>For the Government of the Federative Republic of Brazil For the Government of the People’s Republic of China CBERS Data Policy</td>
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</table>

Reasonable grounds that continued operation would be injurious to defence of Canada or safety of Canadian Forces

Solicitor General may order any service to Royal Canadian Mounted Police, Canadian Security Intelligence, Government for critical infrastructure protection or emergency preparedness Reasonable grounds service is desirable to fulfill respective responsibilities

Summary: CBERS data is available for free for all of Latin American countries only. Currently under CBERS agreement, open access but possible movement to adopt other policies. Data downlinks licensed based on per-minute fee basis. China and Brazil may agree in a few special cases to transfer data free. Now includes Mozambique, Angola, and some other African countries. CRESDA and Brazilian ground stations have unlimited access. Distributors are licensed. Independent price list for distribution solely within national market. Can not be exported abroad. INPE and CRESDA set international prices.

General Considerations: The downlink data is open to any country or organization and is based on the conception that CBERS imagery will be distributed by licensed representatives who operate an application system infrastructure that performs data reception and processing. Each ground station receives the image raw data and processes it into image products, which will then be distributed to users. The licensing of CBERS...
the development of man's space programs."

| | | data downlinks is based on fees which are charged in a per-minute basis. China and Brazil may, in a few special cases, upon mutual consultation, decide on the transfer of data free of charge. The ground stations operated by INPE in Brazil and by CRESDA in China have unlimited access to all data collected within their footprint. The policy for distribution of data collected by those ground stations will be defined by each operator.

**Licensing Policy For International Ground Stations**

(a) CBERS data reception, processing, and distribution to other countries will be carried out by licensed representatives jointly appointed by CRESDA and INPE.

(b) The licensed representative will commercialize CBERS data downlink to ground stations based on a annual fixed basis, based on a fee determined by INPE and CRESDA. The annual fee will be determined by the conditions of the ground stations, including geographical location and antenna footprint.

**Product Distribution Policy**

The commercial agreement between licensed representatives and distributors shall include the following:

(a) The right of receiving, processing, and distributing CBERS data shall be granted to the distributor by the licensed representative……

(f) Each distributor could set its native price list independently for distribution solely within its respective national market. Images distributed within the distributor’s national market may not
<table>
<thead>
<tr>
<th>European Community</th>
<th>EC Directive 96/9/EC, Articles 7 (1); 10 (1); 10 (2); 10 (3); Recital 41; Recital 53</th>
</tr>
</thead>
<tbody>
<tr>
<td>Germany</td>
<td>Satellitendatensicherhertsgesetz Proposed 3-part law, drafted and in progress. Proposed. For advanced systems. Three kinds of licenses: 1. satellite operation 2. general data distribution 3. specific data transactions Proposed. National security is priority with commercial aspects secondary. Intent of proposed data distribution mechanism is to create a system in which an operator (&quot;Betreiber&quot;), a distributor (&quot;Datenanbieter&quot;) or an operator/distributor (&quot;Betreiber zugleich Datenbieter&quot;) will be licensed. To distribute data to users, they will be required too implement a &quot;geomatrix&quot; provided by the government that includes a check list to determine sensitivity of the transaction. There is potential liability if a distribution mistake is made. Penalties may include incarceration.</td>
</tr>
<tr>
<td>Hong Kong (special administrative region of China)</td>
<td>An Ordinance to Confer Licensing and Other Powers on the Chief Executive to Secure Compliance with International Obligations of the</td>
</tr>
<tr>
<td>Country</td>
<td>Law and Regulations</td>
</tr>
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<td>--------------</td>
<td>--------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>India</td>
<td>No space or remote sensing law.</td>
</tr>
<tr>
<td>Iran</td>
<td>Parliament approved bill to establish Iranian Space Agency, 2003</td>
</tr>
</tbody>
</table>

National Center for Remote Sensing, Air, and Space Law
U.S. Department of Commerce / National Oceanic and Atmospheric Administration vii
thinking about this. In principle: all data open to public. No specific resolution limit. Satellite by satellite basis. Who is requesting data and why? Could be discussed internally.

Guiding principles:
--All data can only be used for peaceful purposes.
--JAXA retains intellectual property rights to all data.

User categories:
1. Public data users
   Contribute to promotion of data utilization
   Cost of reproduction
   Should be “almost no charge” on networks
   Distributed by JAXA

2. Other data users
   Includes commercial
   Low price but not less than offered by private companies
   Distributed through private enterprise

National security
Information Gathering Satellite (IGS)
Classified data

Rules to be established for processed data
Solve Earth observation data provision issues
Encourage data use

Ideal Ways to Provide data:
--Government initiative and must be made widely available to benefit society
--Implement standard data processing and enable people other than observation technology experts to use data
--Establish environment to have private entities
<table>
<thead>
<tr>
<th>Country</th>
<th>Policy/Act</th>
<th>Instructions</th>
<th>Additional Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Malaysia</td>
<td>Security Act Instruction 20 for Disaster Response National Space Policy</td>
<td>No restrictions on data distribution until higher than 5 meters spatial resolution. Then inquiry is made into who is buying the data and why. Similar policy regarding topographic maps. A restricted data policy is in review for space and aerial data for both foreign and Razaksat data. Malaysian Federal Treasury Department sets data pricing policy. Need to sell data at twice the cost to recover costs. Client’s Charter: Provides data and value added products on commercial contract basis. Time line: Digital 5 days Computer printed product 2 – 3 weeks Photographic printed product 2 – 3 weeks Digital or printed value-added product 4 – 6 weeks Data and information for disaster applications “utmost priority” and as soon as technically possible.</td>
<td></td>
</tr>
<tr>
<td>Nigeria</td>
<td>None Prohibitions of Copyright Act National Geospatial Data Infrastructure Policy Legal Subcommittee</td>
<td>In process by National Geospatial Data Infrastructure Policy Legal Subcommittee (to include data derived from Nigeriasat 2)</td>
<td></td>
</tr>
<tr>
<td>Poland</td>
<td>None</td>
<td>None</td>
<td>As per contract with satellite data provider, which incorporates the national licensing requirements to which the satellite data provider is subject.</td>
</tr>
<tr>
<td>Country</td>
<td>Law/Rule</td>
<td>Concept/Policy</td>
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<tr>
<td>South Africa</td>
<td>South African Space Affairs Act, No. 64, 1995. (Expected to be substantially revised soon.)</td>
<td>None (None specifically related to data from national satellites. Emerging data policy has not yet been published, but the intention is to grant free access to academic and government users. The question of whether commercial users should pay costs has not been resolved yet. Other data generated by publicly funded institutions makes data as widely and as easily accessible as possible, and commercial users are charged.)</td>
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National Center for Remote Sensing, Air, and Space Law
U.S. Department of Commerce / National Oceanic and Atmospheric Administration
<table>
<thead>
<tr>
<th>Country</th>
<th>Law/Act</th>
<th>Policy/Access</th>
<th>Notes</th>
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<tbody>
<tr>
<td>South Korea</td>
<td>Law on Space Activities, Federal Law No. 5663-1, from August 20, 1993, as amended. Act on the Promotion of Space Activities, Nov 2005</td>
<td>None</td>
<td>None</td>
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<td>Spain</td>
<td>Royal Decree No.278-1995, Space Exploration.</td>
<td>None</td>
<td>None</td>
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<td>Thailand</td>
<td>None</td>
<td>None</td>
<td>Policy in process. Expected lower price to government than private sector. Free data for educational use, use report required in exchange. Data access is on a case-by-case basis for the private sector. Free data for disasters. Policy being formulated for THEOS. Should be nondiscriminatory. Will be free for government. A consultant’s report will go to GISTDA’s Board for implementation. The minister of Science and Technology approves.</td>
</tr>
<tr>
<td>Country</td>
<td>Relevant Laws and Policies</td>
<td>Various Agreement and Other Policies</td>
<td>Notes</td>
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<td></td>
<td>National Defense Authorization Act for Fiscal Year 2005</td>
<td>(b) Licensing requirements [for commercial systems]</td>
<td></td>
</tr>
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<td></td>
<td>U.S. National Space Policy, October, 2006</td>
<td>§ 5651. Nondiscriminatory data availability</td>
<td></td>
</tr>
<tr>
<td></td>
<td>U.S. Commercial Remote Sensing Policy, April 25, 2003</td>
<td>Except as provided in subsection (b) of this section, any unenhanced data generated by the Landsat system or any other land remote sensing system funded and owned by the United States will be made available to the government of any country (including the United States) as soon as such data are available and on reasonable terms and conditions;</td>
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</tr>
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</table>
States Government shall be made available to all users without preference, bias, or any other special arrangement (except on the basis of national security concerns pursuant to section 5656 of this title) regarding delivery, format, pricing, or technical considerations which would favor one customer or class of customers over another.

(b) Exceptions
Unenhanced data generated by the Landsat system or any other land remote sensing system funded and owned by the United States Government may be made available to the United States Government and its affiliated users at reduced prices, in accordance with this chapter, on the condition that such unenhanced data are used solely for noncommercial purposes.


(a) Disclosure Prohibited.--Land remote sensing information may not be disclosed under section 552 of title 5, United States Code.

(b) Land Remote Sensing Information Defined.--In this section, the term "land remote sensing information"--

(1) means any data that--
(A) are collected by land remote sensing; and
(B) are prohibited from sale to customers other than the United States Government.
(2) includes any imagery and other product that is derived from such data.

(c) State or Local Government Disclosures.--Land remote sensing information provided by the head of a department or agency of the United States to a State or local government may not be made available to the general public under any State or local law relating to the disclosure of information or records.

(d) Safeguarding Information.--The head of each department or agency of the United States having land remote sensing information within that department or agency or providing such information to a State or local government shall take such actions, commensurate with the sensitivity of that information, as are necessary to protect that information from disclosure prohibited under this section.

(e) Other Definitions.--In this section, the terms "land remote sensing" and "United States Government and its affiliated users" have the meanings given such terms in section 3 of such Act (15 U.S.C. 5602).

| United Kingdom | Outer Space Act, 1986. | None | None |
| COOPERATIVE SYSTEMS | CBERS (Brazil and China) | N/A | Summary: Currently under CBERS agreement, open access but possible movement to adopt other policies. Data downlinks licensed based on per-minute fee basis. China and Brazil may agree in a few special cases to transfer data free. Now includes Mozambique, Angola, and some other African countries. CRESDA and Brazilian ground stations have unlimited access. Distributors are licensed. Independent price list for distribution solely within national market. Can not be exported abroad. INPE and CRESDA set international prices.

General Considerations: The downlink data is open to any country or organization and is based on the conception that CBERS imagery will be distributed by licensed representatives who operate an application system infrastructure that performs data reception and processing. Each ground station receives the image raw data and processes it into image products, which will then be distributed to users. The licensing of CBERS data downlinks is based on fees which are charged in a per-minute basis. China and Brazil may, in a few special cases, upon mutual consultation, decide on the transfer of data free of charge. The ground stations operated by INPE in Brazil and by CRESDA in China have unlimited access to all data collected within their footprint. The policy for distribution of data.

For the Government of the Federative Republic of Brazil For the Government of the People’s Republic of China CBERS Data Policy |
collected by those ground stations will be defined by each operator.

**Licensing Policy For International Ground Stations**

(a) CBERS data reception, processing and distribution to other countries will be carried out by licensed representatives jointly appointed by CRESDA and INPE.

(b) The licensed representative will commercialize CBERS data downlink to ground stations on an annual fixed basis, based on a fee determined by INPE and CRESDA. The annual fee will be determined by the conditions of the ground stations, including geographical location and antenna footprint.

**Product Distribution Policy**

The commercial agreement between licensed representatives and distributors shall include the following:

(a) The right of receiving, processing and distributing CBERS data shall be granted to the distributor by the licensed representative.

(f) Each distributor could set its native price list independently for distribution solely within its respective national market. Images distributed within the distributor’s national market may not be exported abroad.

(g) When distributing abroad, the distributor must refer to the international price list set by INPE and CRESDA.

1. The Parties are agreed on the following principles:
   a) The data requested by one or the other of the Defence Ministries shall belong to the Defence Ministry having requested the programming.
   b) For other data:
      i) the French Party is owner of the data generated by the optical component;
      ii) the Italian Party is owner of the data generated by the radar component.

2. Civil and commercial distribution:
   In accordance with the common provisions on the use of data set forth in Article V, concerning the distribution and commercialisation of products derived from the dual-use satellite system, the Parties shall, in the course of Phase 1, define a common distribution policy. Each of the Parties shall designate a body to act as the interface with civil and commercial users, and to formulate, promote and distribute the data destined for civil and commercial users.

(RE: Optical system. As further formulated pursuant to the Turin Agreement)
CNES holds copyright
License to use granted to defense, cooperating countries, and institutional users for non-commercial use full and exclusive license for data under responsibility of commercial operator.
System resources, including data, allocation:
40% = institutional bodies
less than 10% = defense