

# **Normative Profiles of Remote Sensing**

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The acceleration given to the planetary dissemination of information by the technological innovations of the nineties – Internet, CD rom, multimedia communication, etc – has opened up commercial access to the key-area of satellite imagery data. Formerly these data had only been available for the intelligence services of the two superpowers.

The abundance of remote sensing data resulting from the emergence onto the market of private enterprises as well as the development of advanced software and data processing techniques, has modified the international strategic set-up: a plurality of juridical subjects (not only States) are now in a position to affect the guidelines of international policy.

The growing accessibility to high-resolution satellite imagery data – even if still on a reduced scale – is the result of the pressure of international powers (multinational enterprises) eager to overcome national and international control (with regard to security implications) and restrictions, in order to feed international competition.

On the other hand the massive technology transfer from the military to the civilian field started exactly at the beginning of the nineties when the post-Soviet ruling class, in an attempt to stem the incipient financial crack and to drain hard currency, allowed some agencies to sell panchromatic high-resolution (about 2 m) images available from military reconnaissance satellites, able to supply detailed images and strategic information for dual-use.

Analysts estimate that in the first decade of the twenty-first century the market for civilian and commercial applications of remote sensing data and images will witness an exponential growth.

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The large amount of quality imagery data supplied by space-based remote sensing systems and transformed into high added value information thanks to refined image processing and data analysis techniques; the innovation of geographic information system (GIS) software and the use of Digital Terrain Modelling (DTM) able to supply sophisticated mapping of unknown zones, will be of increasingly easier access to a plurality of actors in a context of “open skies” policy and of remote sensing data commercialization.

### **Future perspectives for the data market**

Analysts confirm the trend of a transition of technological and financial capabilities in manufacturing and launching different types of earth

observation satellites or satellite systems from national governments to private enterprises.

Commercial firms which were previously dependent upon national (or international) space programmes or had a supporting role and their functions referred only to data archiving and services marketing, are now seeking to create their own remote sensing systems.

In recent years there has been a growing number of multinational relationships. i.e. commercial joint ventures between firms and also between governments and private enterprises, able to launch and operate their own earth observation satellite systems and to distribute air-borne images through sophisticated ground infrastructures.

Another factor which contributed to the engineering and development of remote sensing private enterprises lies in the perception of the greater importance and urgent necessity of coping with environmental issues.

Governments and international organizations are not in a position to deal with all vital questions for the future of the planet, such as resource mapping, monitoring and management, weather forecasting, hazard monitoring and disaster assessment, urban planning and agricultural monitoring, etc..

Private enterprises have thus seen here a unique opportunity to make profit out of an "ethic imperative": the welfare of the planet.

A major catalyst for investing in earth observation satellite systems and ground infrastructures has been the necessity to meet these urgent requirements and the belief that a promising market exists for high resolution imagery data and processed information in a world which is increasingly dependent on communication and computing.

The development of Internet and database software has, in fact, diminished the barriers that once made remote sensing data accessible only to large government organizations.

Private commercialization began in the mid-eighties when limits were given to government budgets: the creation of EOSAT operating the Landsat system and marketing the resulting imagery data; the development of the French SPOT system operated on a commercial marketing basis; the decision of other national observation satellite systems to develop a commercial market

for data products and applications; the 1994 American political decision to loosen State restrictions so as to allow private firms to develop own remote sensing systems and sell data to foreign customers. All of these are steps towards the evolution of a commercial remote sensing policy which could favour global accessibility to Earth observation data.

This ever changing situation raises issues and questions especially with regard to the management of the complex remote sensing environment (new technological capabilities, net-distribution of imagery data and value-added products, range of users, rapid growth of value-added firms, multinationalization of remote sensing enterprises etc.) and the delicate political decision on whether and how to set limits on the use of civilian and commercial remote sensing operations.

A challenge for the international community is to lay the basis for international cooperation and for the elaboration of common standards and practices to ensure that space activities are carried out in a legally systematic and orderly fashion.

## **Normative profiles of remote sensing**

A well-known sixteenth century quotation by the Oxonian Alberigo Gentile *silete theologi in munere alieno* could be here repropounded in a formulation suited to the topic of this paper: *silete juriconsulti in munere alieno*, where *munere alieno* (to the jurist of course) stands for the amount of technical and scientific notions related to the field of remote sensing. On the other hand the urgent necessity to regulate the economic and social relations which envelop the pure technological datum, leads to laying the cautions of a hasty *epoché* aside and induces the jurist to take the floor.

Just to get into *medias res* it must be observed that the normative framework related to remote sensing activities is rather scanty.

In substance, there are two normative foundations within international law, which - even if with different effectiveness and binding force - domestic or

community normative sources have (or will have) to refer to: the 1967 Space Treaty, a sort of *magna charta* of outer space; the 1986 U.N. resolution 41/45. It is important to observe that even for remote sensing the juridical aspect - due to the strictly epiphenomenal nature of law - can only reflect and regulate the substantial dicotomy which exists in *re ipsa* in the technological datum and which is structured in two different segments: the space segment (the satellite and related orbit operation) and the ground segment (data receiving stations).

The normative questions related to these two segments are juridically reflected in the structural organization of the principles of the 1986 U.N. resolution, principles which do, however, reflect the guidelines of public and private international law.

I am now going to partially deconstruct the framework of the resolution and then to analyse the most relevant points, grouped according to the previously mentioned criterium.

The first observation is that principle I underlines the interest of all States in a more rational use of the land and the protection of the environment. This concept is stressed in principles X and XI by which the importance of promoting the development of the Earth's natural environment and the protection of mankind from natural disasters through remote sensing activities is reasserted.

On this point principle IV clearly establishes the obligations of the sensing States, i.e. the countries which operate remote sensing satellites. The nature of these obligations derives from the concept of "freedom in the exploration and use of outer space in the interests of all countries", in virtue of the specificity of outer space as *res communis omnium*, by which no sovereignty rights can be claimed, as provided in articles I and II of the 1967 Outer Space Treaty.

The Treaty asserts:

- respect for the principle of full and permanent sovereignty of the sensed States;

- respect for the prohibition to conduct remote sensing activities "in a manner detrimental to the legitimate rights and interests of the sensed State". In this respect it can be observed that a proposal advanced by France and the ex-URSS suggested the prohibition of resolutions higher than 10 meters, as they were not functional to the best management of resources and the environment. On the contrary they could represent a real control of human activities with the subsequent violation of the principle of the right to privacy of States and individuals.

In order to respect the principle of full sovereignty of the sensed States, articles IX, X and XI recommend that the processed data and analysed information are disclosed and made available.

The resolution recommends, in fact, in principle IX that "the States carrying out a programme of remote sensing shall inform the Secretary-General of the United Nations and make available any other relevant information to any other State, particularly any developing country that is affected by the programme, at its request". The above mentioned articles X and XI contain explicit recommendations to the States carrying out earth observation activities to make available identified information in their possession "to avert any phenomenon harmful to the Earth's natural environment" and "to promote the protection of mankind from natural disasters".

It is, however, the recommendation of "making data available" to countries affected by remote sensing activities, particularly the developing countries, that poses problems and difficulties.

The juridical aspect of the conditions of access to data produced under public (governments or intergovernmental entities) or private (enterprises or other private entities working on a competitive basis) regimes, is a real *vexata quaestio*, which the resolution tries to tackle in principle XII.

The principle asserts that "the sensed State shall have access" both to primary and processed data as well as analysed information concerning the territory under its jurisdiction on a non-discriminatory basis and at reasonable costs.

A certain degree of ambiguity underlies this principle, as the recommendation of information and availability of data seems to be

binding only for the States participating in remote sensing activities and there is no reference at all to the commercialization activities of private entities. Moreover there is no reference to the conditions of access to analysed information and this has surely weakened the importance of the resolution. Principle XII maintains, however, its importance which lies in the fact that for the first time, and ten years beforehand, both public and private aspects of remote sensing are taken into consideration or are at least hinted at. It reflects, in fact, the overall trend of a growing participation of private industries in the developing market of earth observation techniques. Important juridical issues will call, therefore, for a review of the status of the existing legal instruments on remote sensing because more precise rules are needed in the observance of the principle of data commercialization under a competitive system.

It is obvious that private subjects, operating in a free market, will not be ready to invest huge amounts of money unless juridical protection is granted for a period of at least 10-15 years. It will, therefore, be necessary to distinguish between earth observation data which serve public purposes (e.g. meteorological and security data) and data which do not fall within a category of public utility .

Last but not least, special attention should be drawn to principle XIV on liability. This principle represents a challenge for the jurist who is entangled in a hermeneutical activity which is far from being easy as a result of its too vague formulation especially in the second part.

The concept of liability the principle expresses is in compliance with the 1972 Convention<sup>1</sup> and with art. VI of the Space Treaty.

The principle, in fact, asserts absolute responsibility for the States operating remote sensing satellites, while there is a reference to the norms of international law for the derived activities.

The mitigation in the absolute responsibility regime, all to the advantage of the derived activities which are generally carried out by private entities, is a faint but clear signal that space law is keeping pace with rapidly changing space activities.

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<sup>1</sup> *Convention on International Liability for Damage Caused by Space Objects*, March 29, 1972, U.N. GAOR 25<sup>th</sup> Sess. n. 29, Doc. A/8429.

The growing involvement of non-governmental entities in the management of outer space has led to the consideration that it would be inappropriate to charge private entities with such onerous responsibilities for damage caused by their space activities, a responsibility which only the States are in a position to bear.

It is now time to go back to the issue of data protection, a crucial issue for the future of remote sensing which the jurist as an interpreter and observer of the modified standards of reality (the transition from State monopoly to the market regime and consequent commercialization of space activities) has the difficult task of dealing with urgently.

As far as data protection is concerned, the doctrine makes a distinction between primary and processed data, as emerges from principle I of the above mentioned resolution. In conformity with this distinction, the doctrine poses the question whether criteria of intellectual creation in the data processing or, on the contrary, economic criteria referred to the investments made, should be applied.

The debate has been and still is wide open. After long and in-depth studies, The European Parliament has adopted the directive 96/9/EC on the legal protection of databases<sup>2</sup> The directive concerns a juridically relevant protection, the protection by copyright, which is granted to processed data arranged in a database that, according to art 1 of the directive “shall mean a collection of independent works, data or other masterials arranged in a systematic or methodical way”, and which by reason of the selection or arrangement of their contents constitute the author’s own intellectual creation<sup>3</sup>.

With regard to this definition it must be observed that remote sensing data fall within the definition of protected works as laid out in the two most important conventions: The Berne Convention for the protection of Literary and Artistic Works of 1886, last revised Paris 1971; and The Universal Copyright-Convention, Geneva 1952, revised Paris 1971.

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<sup>2</sup> Directive 96/91 E.C. of the European Parliament and of the Council of the 11 March 1996 on *The Legal Protection of Databases*.

<sup>3</sup> *Ibidem*, art. 3.

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## Conclusions

The legal perspectives for a harmonious development of the sector of remote sensing data commercialization lie in the definition of domestic laws which acknowledge the EC directive on the protection of databases, so as to favour a broad expansion of earth observation activities and, at the same time, ensure an adequate juridical protection to the investments of the private sector.

Finally, better protection of the land and the environment could be further obtained by acknowledging principles IX, X, XI and XII of the UE resolution 41/45, and at the same time by extending the protection to all private entities carrying out remote sensing activities<sup>4</sup>.

These items are on the agenda of the Committee of the Peaceful Use of Outer Space and they will be discussed by the related Legal Subcommittee. The solutions which will be adopted should then be acknowledged by the domestic law of all participating countries.

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<sup>4</sup> The urgent need for domestic laws is due to the fact that according to doctrine the principles of a resolution do not have own binding force but are valid only as a recommendation.

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