

SHARING OF REMOTE SENSING DATA CONCERNING ENVIRONMENTAL PROTECTION FOR PUBLIC BENEFIT

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Abstract

A wider and inexpensive distribution of remote sensing data concerning the protection of the Earth's environment may be a concrete realisation of the international co-operation which extends to all countries the benefits deriving from a peaceful use out outer space.

After examining the inter-dependence between environmental protection, remote sensing and public benefit, the legal basis of the obligation to distribute the data will be studied.

The Principles on Remote Sensing of the United Nations do not mention the issues concerning the international commercialisation of the data, the notion of public benefit or intellectual property. There is a generic solicitation towards co-operation. The obligation for immediate diffusion of the data to the involved States is only foreseen for information which can help to prevent harmful events or natural catastrophes. In this case international co-operation is more active and various initiatives, which are considered in this paper, have begun their course.

A detailed study of the most emblematic data distribution policies (United States, France, ESA) shows an increasingly strong opening, albeit carried out in different manners, in favour of research in disciplines concerning the Earth.

The initiatives of rules of the European Union concerning satellite data and the protection of environment prove the developing interest in this sector for a growing international co-operation.

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Link between public benefit, protection of the Earth's environment and Remote Sensing

The agenda item of "Outer Space Benefits" has already been faced various times during the past years by the Legal Subcommittee of the UNCOPUOS. During the Spring Meeting of 1996 a Draft Resolution was drawn up to be presented to the United Nations General Assembly¹. The "Declaration on International Co-operation in the Exploration and Use of Outer Space for the Benefit and in the Interests of All States, Taking into Particular Account the Needs of the Developing Countries" moves from art. 1 of the Outer Space Treaty so that the States can commit themselves concretely and ensure that the exploration and application of outer space may benefit all countries. The main point of the Draft Resolution is that these benefits can be enjoyed by all countries, and especially by the developing ones, only thanks to a strengthened international co-operation. It is true that the countries are free to determine all the aspects of the co-operation (art. 2) but this, among the other aims, must facilitate the exchange of expertise and technology among States on a mutually acceptable basis (art. 5).

The approval of the Resolution could be a positive answer to the requests of the group of 77 developing countries meeting each year to establish a new international order for Outer Space; they claim that Outer Space is to become an instrument for social and economic development for those countries who are lacking.

In order to go beyond generic propositions a more constructive approach for co-operation would be that of finding out specific fields, where common interests are present, where the co-operation itself could take place².

One of the branches in which each

member of the international community has acknowledged mutual dependence and the necessity to co-operate in order to reach a common interest, the interest in survival, is environment. The protection of environment is one of the most urgent problems of the modern world, both for the developing and the industrialised countries. It has serious and complex aspects, on one hand because at times the pollution phenomenon reaches catastrophic proportions or often exceeds the sphere of sovereignty of each State involving the sovereignty of other countries or common areas, and on the other hand because a higher authority is missing from the international point of view for the prevention, control and removal of its causes.

In order to be protected the environment must be studied, its deterioration identified and its remedies discovered. The lack of balance existing on Earth is due either to natural causes or to the irrational use of its resources by mankind³. Remote sensing can intervene and give an important contribution to be completed with actions on Earth to establish the state of environment. By giving many and precise details it allows a faster and more effective, and at times less expensive, intervention⁴. Therefore the link between the two branches is stressed.

The use of remote sensing has become extremely important for many countries which have developed more and more sophisticated satellite programs.

The National Aeronautics and Space Administration (NASA), the National Oceanic and Atmospheric Administration (NOAA) and the Earth Observation Satellite Company (EOSAT), the commercial distributor of Landsat data, are the major actors in the provision of Earth remote sensing data in the United States. With the Landsat satellite data progress is made in the research on Earth part of the Mission to Planet Earth program.

France uses SPOT satellites for remote sensing and the private law company SPOT IMAGE is entrusted with the distribution and commercialisation of the data.

The RADARSAT is the first Canadian Earth observation satellite and the first civilian operated radar-equipped satellite.

The Japanese Space Agency (NASDA)

has launched four meteorological geostationary satellites, two maritime observation satellites (MOS-1, MOS-2) and a remote sensing satellite for Earth resources (JERS-1); at present the NASDA is developing the Advanced Earth Observation Satellite and the American-Japanese Tropical Rainfall Measurement Mission.

The European Space Agency (ESA) entered remote sensing in 1991 with the launch of the ERS1 satellite the data of which contributed to the reconstruction of a particular vision of Earth and of the changes in its environment. With the help of the altimeter the satellite gave information on the sea bed of the Arctic Ocean under a thick cover of sediments, water and ice. The microwave beam of the high resolution SAR instrument of the ERS 1 penetrates the clouds whereas the optic sensors are unable to do so and therefore offers useful information for the tropical eco-system. Thanks to the ERS data scientists are able to calculate the deformations of the Earth's surface caused by earthquakes and the speed of the movements of glaciers; they can draw three-dimensional charts (DEM) and observe the tectonic movements of whole continents with interferometry. It is now possible to keep the petrol pollution and the complex climatic changes under control. The recently launched successor ERS 2 is a copy of the first satellite with some innovations concerning an instrument for the global measurement of the ozone levels, an infrared radiometer to enhance the systematic control of vegetation and a PRARE instrument which will render the instruments on board more precise. During the 1992 Space Conference in Granada another great European program for Earth observation was established: the first satellite of the ENVISAT program will be launched in 1998.

The acknowledgement of the necessity of preserving the state of our environment, be it oceanic, continental or atmospheric, has caused a growing need for global observation.

The legal problem we are interested in is to see how the satellite data, especially the data concerning the protection of the Earth's environment, may be largely distributed and used for the benefit of all the States in accordance with the Outer Space Treaty and with the above mentioned recent draft resolution of the United

Nations.

Starting from the United Nations Resolution of the Principles on Remote Sensing and from its rules which try to extend, with more or less clarity, the benefits of remote sensing to all countries, we shall examine the policy of distribution and commercialisation of data carried out by some countries, those which have launched their satellites for the longest time, and by the ESA.

The United Nations Principles on Remote Sensing concerning environmental protection

The main legal reference on an international level is the Resolution 41/65 of the General Assembly of the United Nations, adopted on December 4th 1986 on "The Principles on Remote Sensing of the Earth from Outer Space". Detailed studies on the principles having been carried out in other occasions, we shall therefore only examine those principles concerning the distribution of the data⁵.

With remote sensing the States will pursue the purpose of improving natural resources management, land use and the protection of the environment (principle 1,a). The offset of the principle, which is remarkably controversial, is found in principle II where it is stated that remote sensing activities shall be carried out for the benefit and in the interest of all countries and in principle V where the States, carrying out remote sensing activities, are asked to promote international co-operation. If a wider distribution to all countries of the remote sensing data concerning environmental protection were to be carried out these aims would be substantially already reached. Unfortunately the dispositions of the resolution of the principles do not help very much in this sense.

Principle XII indicates, rather generically, that all States must have access to the data on a non-discriminatory basis and on reasonable cost terms. The principles do not impose any obligation to gratuity or mutual exchange of data. They do not mention questions concerning the international commercialisation of the data, the notion of public service, the tariff regulations and the intellectual property. The rules have been

imposed by practise by the single States or by the ESA or they are included in some national regulation.

The consultation with a State whose territory is sensed in order to make available opportunities for participation and enhance mutual benefits to be derived therefrom (principle XIII) is not compulsory for the State carrying out the remote sensing.

The promotion of international co-operation, including technical assistance and co-ordination in the area of remote sensing (principle VIII) is entrusted to the United Nations and the relevant agencies within the UN system and to the initiative of each State⁶.

An opening towards a help policy is offered by the second part of principle XII where it is stated that when giving access to the observed States to the primary data and the processed data concerning the territory under their jurisdiction, the State participating in remote sensing activities must take into particular account the needs and interests of the developing countries. In this case the reasonable cost terms must be particularly favourable⁷.

Two positions face the problems of environment more directly. Principle X establishes that remote sensing shall promote the protection of the Earth's natural environment. For this purpose States participating in remote sensing activities that have identified information in their possession that is capable of averting any phenomenon harmful to the Earth's environment shall disclose such information to the States concerned. Principle XI indicates that remote sensing shall promote the protection of mankind from natural disasters. The States participating in remote sensing activities shall transmit data and information in their possession to the States affected by natural disasters or likely to be affected by impending natural disasters. No mention is made of the conditions for disclosing such information; however, because both cases involve information concerning environmental protection and therefore relevant to a public heritage it would be logical for the information to be disclosed free of cost⁸.

On the subject of natural disasters the United Nations have established some initiatives for international co-operation. The Department for Humanitarian Affairs (DHA), a specialised

office of the Secretary General of the United Nations responsible for all disaster-related matters has been created. One of the main purposes of this office is to mobilise, direct and co-ordinate external assistance provided by the United Nations system in response to disasters. The DHA helps to prevent potential catastrophes by studying and foreseeing them. In this activity and in the four phases of the management of catastrophes, preparedness, mitigation, response and recovery, a remarkable support is given to the DHA by the new technologies of remote sensing. The Department acts in co-ordination with other international organisations, most of which belong to the United Nations. Finally, the DHA participates in the International Emergency Readiness and Response Information System, a system uniting a growing number of international organisations for crisis management who adhere voluntarily to disclose and obtain the useful information⁹.

In the last years the developing countries have requested the United Nations for a Third Conference on the Peaceful Use of Outer Space (UNISPACE III). The changed international political situation and the advance of new technologies must be taken into consideration in the Third Conference leading to the use of the new means offered by outer space for universal concern. One of the branches of application is the protection of environment and natural catastrophes¹⁰.

The principle of international co-operation has led various International Intergovernmental Organisations to commit themselves to specific studies on Earth's environment. The World Climate Research program has been promoted by the World Meteorological Organisation (OMM); the United Nations have created a program for environment (PNUE), UNESCO has carried out various initiatives and the Forum of Space Agencies (SAF) has included the Mission to Planet Earth project in its program. This leads us to think that, at least in the branch of environmental studies, the policy of the States is leading towards international co-operation.

One last observation is to be made on the compulsory value of the United Nations Resolution of the principles on remote sensing. In actual fact it has a recommendation value

even though, having been adopted by "consensus", it expresses the legal opinion of all the community. Should the following study on the policy adopted by the States and by the ESA for the diffusion of the remote sensing data show an increasing attitude favouring scientific research for the Earth's environment it could be claimed that a customary norm is being established. The States are realising that the protection of the Earth's environment is compulsory and that it involves all mankind, and therefore any behaviour in favour of research (distribution of data free of cost or on extremely advantageous cost terms) is to be seconded.

Data distribution policy of the United States, France and ESA

The market of space data concerning Earth observation is in full progress and it has not yet reached a sufficient maturity for the application of the laws of the market. At present the procedures change considerably from one country to another, and at times from one operator to another in the same country; they vary according to the nature of the data of the programs, of the categories of the users or of the use of the information. For the purpose of this study we shall consider the policy of the United States and of France, two countries which have launched remote sensing satellites in outer space for the longest time, in order to stress the apparent differences.

Since the beginning of the Eighties the United States carried out a policy similar to the one applied to research satellites. The 1984 Land remote Sensing Commercialisation Act laid down more precise dispositions for the Landsat program and transferred the distribution and commercialisation of the data to a private commercial society (EOSAT). This policy, called two tier policy, established at that time the sale of the data at a small cost to the American government and its affiliated institutions and at a commercial rate, on a global and non-discriminatory basis, for other users.

This law does not imply a protection of the remote sensing data by use of copyright, which would have created a legal protection *erga omnes* and a free exploitation by its owner,

but through the use of the confidential trade secret procedure. The information is a confidential trade secret of EOSAT and its reproduction would cause a misappropriation of the trade secret itself. The American legislator, fearing that the holders of the data could make illicit profits, preferred to chose this form of protection¹¹.

In 1992 the commercial policy of Landsat was rediscussed due to the pressure of the scientific community and a new "Land Remote Sensing Act" was issued. The American law insists on the research concerning environmental changes and presses for a systematic supervision. The law transfers the responsibility of the program from the Department of Commerce to the Department of Defence and confirms a precise regime of licence for the administrative enjoying of totally private remote sensing systems, the latter having to act in accordance with the principle of equal access to the data. As for the distribution of the data the United States have adopted a free access policy, often free of charge, which is particularly generous for the users because the costs are completely sustained by the American government. The law of 1992 establishes that the access to data is to be carried out at the cost of fulfilling user requests. This excludes any other non direct cost such as the amortisation of the space system and the land stations or the commercial margin¹².

The NASA develops and operates experimental satellites and conducts scientific researches on Earth as part of the Mission to Planet Earth program in co-operation with many countries. The policy followed is that of a distribution of the data as vast as possible and at the lowest price for the use reserved to research. The data must be available for any user without restrictions and without pre-existing agreements. The new approach acknowledges the international character of research on global change and the necessity of exchanging information rapidly. For the future Earth Observing System (EOS) also the NASA has established a policy of free access, nearly free of cost, a policy which they defend on an international level.

The operational programs of the NOAA also encompass those satellites used for weather

monitoring and prediction. According to the 1992 Land Remote Sensing Policy Act these programs may not be commercialised or privatised. The NOAA distributes the meteorological data in real time on a restricted basis and offers in non-real time distribution services to users at a cost calculated on the marginal cost of the service. This information is distributed without restrictions on its use and distribution. Thanks to the intervention of the government the American companies are therefore favoured by a free access free of cost to all information of meteorological character. This distribution has influenced the policy of the other States and therefore, no competition being possible, the distribution of meteorological products is free and without restrictions.

A Presidential Directive dated May 5th 1994 establishes the fusion of civilian and military programs of meteorological satellites in the Polar orbit including missions of environmental surveillance. This decision will have repercussions on the diffusion of data for meteorological satellites. The possibility of a selective diffusion in case of political crisis or conflicts has been foreseen. In the framework of the new European meteorological system METOP/EPSS the United States have requested, for the instruments they grant, the possibility of refusing - in times of political crisis or conflicts - access to data which could be useful to their enemies and dangerous for the security of the United States, albeit guaranteeing its use to Americans and their Allies. Europe is considering the possibility of accepting this proposal which allows the use of the data at an interesting cost but which restricts the independence of the EUMETSAT in the matter of diffusion of the data.

The policy of the United States is however extremely open, but its offset is the problem of the financing of future satellites. This will have to be faced nearly exclusively in the public balance because private investors are less interested in the operation of remote sensing systems turning to more economically productive applications.

In France, on the contrary to what happened in the United States, no law regulates the legal regime of the activities of the SPOT

remote sensing satellites. The law of July 3rd 1985 on the "logiciels" protected by copyright is applied analogically also to the collection of the remote sensing data. An important effort for harmonisation has been carried out in a circular by the Prime Minister dated February 14th 1994 concerning the diffusion of public data. The circular is an important reference point, but only when the data is of public nature.

The private commercial company SPOT IMAGE in which public organisms of different provenance are associated (remote sensing, industries, French banks and foreign partners) has a licence for the distribution, on a world basis, of the data coming from the SPOT satellites whose copyrights belong to the Centre National d'Etudes Spatiales (CNES). The SPOT IMAGE negotiated sub-licences with the foreign reception stations and with the distributors for the reproduction, distribution and sale of the satellite data in well defined areas. The distribution must be carried out without discrimination, according to the UN Principles, but on a commercial basis. The prices of the products are the market prices: SPOT IMAGE creates specific products upon request of the scientific community but only the products concerning the Eighties have a lower price¹³.

The French policy is changing. There is an interesting study conducted by an inter-department group on the present and future policy for the diffusion of Earth observation data¹⁴. It stresses the importance of the State investments for the development of space systems for the observation of Earth, but the main principle of the diffusion is based on the necessity for a return on the investments. This implies that the producing organisation has the ownership of the primary and processed data and this must also be taken into consideration by the organisation producing the processed data. The protection of the data is carried out by coding and also legally through the protection of the right of intellectual property. Because this does not seem to be apt to protect the primary data the French government will have to support the European directive on the protection of the data base and its extension also to the remote sensing data. The principle of non-discriminatory access to the primary and processed data and to the analysed information must be ensured for all the

users; the diffusion may only be restricted for national security reasons.

The three types of programs to be realised are especially important for our study. The strictly **experimental** studies are destined to **scientific research**, their return consist in the progress of research and techniques. The remote sensing data will be given to the scientific community free of cost or at reproduction cost. The officially selected researchers will publish the results they have reached. The **pre-operational or operational** programs answer missions of **general interest** established by international agreements and in accordance with the commitments taken in the international agreements concerning meteorology, the study of the climate, the preservation of bio-diversity and the fight against desertification. In these cases the return consists in the exchange or common disposition of data and knowledge. The remote sensing data is divided in three sub-groups: the data with free access, free of cost or at the cost of reproduction for each user; the data which is accessible at the same conditions only to a complex of identified users, for well defined purposes and in the framework of co-operation; the data distributed at a high cost or on the basis of bilateral exchanges. Special conditions are granted only to educational and non lucrative research which must not benefit commerce or industry. Favourable conditions are established for the services of those States who are partners in international agreements for co-operation and assistance in accordance with specific criteria. Finally the **pre-operational or operational** observation programs whose data is to be distributed on the basis of a **financial return**. These programs acquire high resolution images of the surface and specialised data concerning meteorology, the ocean and the Earth's resources.

Therefore it may be remarked that the French policy, even in its future projection, is less open than the American one. Despite establishing special conditions for the distribution of data for researchers who work on environmental protection, it does not specify any fixed criteria for the definition of the subjects which becomes extremely discretionary.

The European Space Agency

distributes the data of the ERS Satellites according to a policy approved in June 1994 by the Directive Council of the Earth Observation Programme¹⁵. It is interesting to examine the general principles laid down in the document, the classification of the users and the established prices.

In the name and in favour of the States participating in the ERS programs the ESA has the right of property of the two satellites of which the matriculation was ensured. The two satellites are under the jurisdiction and control of the ESA according to the dictate of the Space Conventions of the United Nations and the ESA can establish the rules for their use.

The distribution of data is carried out on a non-discriminatory basis and without overlooking the rules of international competition. In order to ensure the protection of the satellite's data against any unauthorised reproduction and distribution the Agency shall keep the full property of the satellite data including the rights of intellectual property. The formula chosen is that of copyright even though the criticisms to the system, especially for the primary data, have lead the ESA to contact the European Commission so that the protection systems foreseen by the directive proposal, now approved directive, for the data base, are extended also to the remote sensing data¹⁶.

The Agency grants the receiving stations with whom an agreement has been stipulated a licence to receive, use and reproduce under certain conditions and upon payment of a canon, the data over which the ESA holds copyright. The official distributor of the data is the ERSC Consortium made up of EURIMAGE, for the distribution in Europe and in the Mediterranean Area, RADARSAT for North America and SPOT IMAGE for the rest of the world. However the price policy of the consortium is established by the ESA¹⁷ which still takes care of the classification of the users and of the distribution of the data to the scientific world. As for the classification, the ESA has followed two basic principles: the States participating in the ERS program and having therefore already financed the latter do not pay the royalty on the price of a standard product of ERS; free or favourably based costs must be applied to the non commercial users belonging to the scientific

world¹⁸.

Other than the commercial users, who acquire the data at full price from the Consortium and the internal users who have the data free of cost for the evaluation of the functioning of the instruments, the ESA has classified and established the conditions for the following categories. The **Main researchers** are research groups using the ERS data for basic researches on oceanography geology, hydrology, glaciology, studies on climate, batimetry, meteorology and other topics concerning the Earth. All the European and non-European scientists who have introduced a research project passing the ESA approval receive the data free of cost; they must ensure that the data is only used for research purposes and not forwarded to others. The approved projects are over 300 but the new advertisement for the availability of the ERS1 data in 1994 led to the presentation of 400 new projects. Approximately 300 other organisations or institutions using the ERS data for practical applications in cartography, agriculture, land use, geology and environmental monitoring belong to the category of **pilot projects**. They have the right to receive data free of cost if they acquire the necessary experience in their applications. Both these categories must update the ESA on the progress of their work and the ESA publishes their results. In order to promote the use of the data and to encourage the development of innovative techniques a third category of users has been introduced for **research and demonstration exploitation of the data** outside the two fields used by the previously mentioned categories. The ESA and the commercial distributor examine the projects of the candidates and the chosen ones enjoy privileged access because they only pay the reproduction cost. In order to consider the national investments carried out in the ERS program and to promote the use of the ERS data, the organisations of the participating States which ensure the **operational services** have access at cost price but with a limitation on the use for specific services. Free of cost data is granted to the **meteorological services** of the countries belonging to the OMM, to EUMETSAT and the European Centre for meteorological forecasts. The data must be used for the forecasts and may not be transferred.

The number of users and the exploitation of the ERS data has gone far beyond the initial forecasts. The request coming from research, especially for the topics concerning the Earth, has increased remarkably. This has led to a generalised policy of cost reduction and to a limitation of the role of the ERSC Consortium. Even the new ENVISAT program seems to be more oriented towards experimentation rather than to commercialisation and we can conclude that globally the ESA policy is addressed more and more towards a system of co-operation and communication with the research world.

Community Regulations on the matter

In order to strengthen its role in environmental research the European Union could internationally protect the interests of the users of the land remote sensing data useful for the research itself. The Commission could establish its own position on the price policy and develop the already open consultations with the ESA in order to find a formal agreement on the roles of the two organisations¹⁹.

At present we are still far from this kind of co-operation and there is no Community regulation specifically considering remote sensing satellite data. The initiatives of the Community, which we shall herewith examine, that is to say the directive on the protection of a data-base and the two regulations for environment, have only indirectly involved the present topic.

The most frequent form of protection of the remote sensing data, protecting from improper appropriation, reproduction and distribution, is the right of intellectual property. The Bern Convention of 1886 and its subsequent modifications would allow protection through copyright. However, the assimilation of the technical organisation of a computer archive, consisting in a data base, to a literary work has been rather criticised. The Convention mentions "a collection of works" and not a "collection of data" and wishes to protect originality, the creation of the work, the fruit of the intervention of a human mind. With an extensive interpretation which considers the technical evolution that the "works" have suffered, one could think that this kind of protection could be

applied also to a certain number of data bases with a high documentary added value (processed data and analysed information) where it is possible to find human intervention and originality, but this is hardly applicable to computer products which are the fruit of an automated process, such as the primary data²⁰. The States are certainly free to extend the protection also to the data not answering the characteristics established by the Convention with the risk, however, that they do not make use of the obligation of protection and of the mechanisms of reciprocity in the countries of the Union.

An interesting solution to the problem could be offered by the already mentioned Directive of the European Parliament and Council of 11 March 1996 concerning the legal protection of a data base²¹. The directive distinguishes between a data base, considered as a work of collection and protectable by the member States under the profile of copyright, and the computer contents of the data base itself. If these contents are not already protected the directive establishes a *sui generis* right, that is to say the right of the creator of the data base to forbid the extraction and reuse for commercial purposes of the matters resulting from the data base for 15 years. This right does not have the aim of protecting the creation and originality of the work but more so the investment made for the collection of the raw data. It is placed between the right to incorporeal property and the action for unlawful competition. The States can foresee some exceptions to the "sui generis" right, among which the extraction for teaching and research purposes (art. 9).

Although the ESA has suggested the European Community to introduce a clear reference to the remote sensing raw and processed information in the definition of a data base (art. 1,2)²², the directive is rather generic. This does not exclude the possibility that the collection of remote sensing primary data could enjoy such protection²³.

With the Decision of the Council of December 15th 1994 the European Union, evermore interested in environment topics, adopted a specific program for scientific research, technological development and demonstration on climate and environment

(1194-1998)²⁴. For the purposes of the programme it is necessary to open activities of international co-operation with international organisations and third party countries. Of the four topics on which the programme is based one (c) concerns space technologies applied to environmental monitoring and research. Other than increasing the use of the remote sensing data to improve the methods of forecast, monitoring and management of catastrophes and natural risks, the program wishes to improve the European technological and scientific capacity for the elaboration and interpretation of the Earth Observation (EO) data and to define its purposes. The other aim is to develop the data concerning the EO with European interest by improving the quality and the costs/benefits ratio of the deriving information. In order to reach these aims, which must answer the interests of the European Environmental Protection Agency, the European Union wishes to support the Commission and the States for the creation of a more effective policy and to increase the use of the data gained from Earth observation for the development of a branch of services giving such information.

The freedom of access to information on environmental matters had already been ensured, in the Community, by the Directive 330 of the Council dated June 7th 1990 with the purpose of "guaranteeing freedom of access to information concerning environment in possession of public authorities and the diffusion of the same"²⁵. The information on environment coming from remote sensing may be included in the information of the public authorities, also included in the data base, concerning the state of the environment and the activities or measures damaging it. This information must be given to any requesting natural or artificial person without the latter having to prove their interest. The information may be refused for certain reasons such as public security, the protection of commercial and industrial interests, the protection of individuals and their privacy. However, the directive underlines the exceptionalness of the secret in respect of the general character given to the information. The cost of the information must be "reasonable". Subsequently, with the decision 94/90 of February 8th 1994 the Commission extended the

access of the public also to the documents of the Council and of the Commission and established that a reasonable cost is 10 ECU for 30 pages²⁶.

The dispositions of the directive on the access to information have been resumed in the Convention on Civil Liability for damage resulting from activities dangerous to the environment open to the signature of the States in Lugano on June 21st 1993. The access of the public to the information tends to favour any form of prevention and reductive intervention of the damage and to grate further means for proof to the eventual victim or operator²⁷. The convention, which foresees the adhesion also of States who are not members of the European Council has the aim of reaching an adequate compensation for the damages connected to the alteration of environment but also for the damages caused to persons or goods and of the costs of the measures taken for the prevention of the damage. A regime of objective responsibility has been established therefore independently from the proof of liability and under a certain limited number of exceptions. The person exercising the control of the activity causing the damage is the liable one.

Conclusions

The practise followed in the distribution of the remote sensing data is at present extremely different from one country to the other. The United States have a policy of free access often free of cost which could be favourable for the users because the costs are supported by the American government, but this often has the purpose of ensuring a pre-eminence of the United States in the field. The French policy is more selective and it aims at making the users participate in the financing of the costs of the observation systems.

On the other hand the attention of the public opinion and of politicians has been awakened by revealing signals concerning a possible deterioration of the Earth's environment. Therefore on a national and international level more and more programs are developed for the safeguard of environment and the stabilisation of climate. The interest is no longer of each person but of all mankind and

therefore initiatives for the co-ordination of national and international programs of Earth observation have increased. The researchers working in this field must be advantaged for the use of many and precise elements such as remote sensing can offer.

Many European governments and the ESA have shown attention to this problem and they have adopted a policy of distribution of the data which acknowledges the necessity of covering part of their financial investment in the Earth observation systems and also recognises the necessity to maximise the return of the investments in a non monetary sense. Because the main purpose of the public investment in Earth observation is to maximise the public benefit a wider use of the data is one of the ways to reach this aim. For this reason the purpose of the policy of those States and of the ESA tends to establish preferential categories for some users because of the social value of the research. Usually, a special treatment consisting in giving the data free of cost or at reproduction cost, is offered to the research community and to those operational organisations operating for public benefit and on a non commercial basis. This category at present basically includes meteorological services is now ready to encompass other organisations due to the growing interest in environmental monitoring.

On the contrary of what happens in other branches of space applications, such as meteorology and telecommunications, the community of users of satellite observation does not have an organised structure. The observation of Earth must be the privileged field for international co-operation in order to share the costs of the space systems and to avoid duplications and also to reach a larger exchange of the data concerning the Earth's environment and to strengthen the programs, for the benefit of developing countries, for a better management of the resources and their environment.

These aims are pursued by international organisations among which the most important is the Committee on Earth Observation Satellites (CEOS) with the purpose of optimising space observation among the States members and serving as a focal point for the community of the users²⁸

The need to centralise in regional or international organisations the co-ordination of these space activities, which may be specifically for public benefit, is increasing²⁹. The same above mentioned Draft resolution of the United Nations of Spring 1996 suggests in art. 8 that COPUOS should become "a forum for the exchange of information on national and international activities in the field of co-operation for the exploration and use of outer space".

NOTES

¹Legal Subcommittee UNCOPUOS, 34th sess., Vienna, 18 March-4 April 1996, A/AC.105/C.2/L.202, 27 March 1996.

²SAINT-LAGER, Les pays en développement et le droit des activités spatiales, in DUTHEIL DE LA ROCHERE, Droit de l'espace, Paris 1988, p. 316.

³For the technical and legal issues of the link between the remote sensing and the environment see: "Actes du Colloque International le droit face aux techniques de télédétection par satellite au service de l'environnement, Strasbourg, 2-3-4-juin 1993" sous la direction de COURTELX "Droit, télédétection et Environnement, 1994 (later on: Actes du Colloque de Strasbourg) e *ibidem* KISS, Le droit international de l'environnement et la télédétection, p. 79

⁴MARTIN, Télédétection et protection de l'environnement, in Les petites affiches, 22 juin 1994, n°74

⁵CATALANO SGROSSO, Aspetti giuridici del telerilevamento, in Diritto dello spazio. Recenti sviluppi e prospettive, Proceedings of the Colloquium of Rome 13-14 March 1992, edited by CATALANO SGROSSO, Padova 1994, CATALANO SGROSSO, Mise en oeuvre des principes des Nations Unis de 1986 sur la télédétection, in Actes du Colloque de Strasbourg, note 3, p. 197

⁶GOROVE, Developments in Space Law, Issues and Policies, Dordrecht, Boston, London 1991, p. 306

⁷MARTIN, Droit des activités spatiales, Paris 1992, p.179

⁸WINTER, Access of the public to environmental data from satellite remote sensing, in Journal of Environmental Law, vol 6, n 1, p. 43

⁹SCOTT, Natural disasters, in Actes du Colloque de Strasbourg, note 3, p. 73

¹⁰JASENTULIYANA, Recent Developments in United Nations Activities relating to Outer

Space, presented to 38th International Colloquium on the Law of Outer space, Oslo 1995

¹¹Agreement for Purchase and Protection of Satellite Data between the Department of Commerce and EOSAT, sept. 1985, 27

¹²"Land Remote Sensing Policy Act" 1992, Pubic Law 102-555, Section 2, Finding 13 states: " To maximize the value of the Landsat program to the American public, unenhanced Landsat 4-6 data should be available, at a minimum to United States government agencies, to global environmental change researchers, and to other researchers who are financially supported by the United States Government, at the cost of fulfilling users requests, and unenhanced Landsat 7 data should be made available to all users at the cost of fulfilling user request". see ROBOK SHAFFER, The American Distribution system for satellite remote sensing data, in Actes du Colloque de Strasbourg, note 3, p. 123

¹³DUFRESNE, Le système de distribution des données et produits SPOT, in Actes du Colloque de Strasbourg, note 3, p. 149

¹⁴"Politique de diffusion des données d'observation de la Terre à partir de l'espace" Rapport du groupe interministériel, avril 1995

¹⁵ESA/PB EO (90)57, rév. 6, Paris, 9 may 1994

¹⁶ESA/AF (93) 13, p.3

¹⁷EURIMAGE, Assessment of the Correct Commercial Prices for ERS 1/2 Products, summary report, oct.1995

¹⁸FERRAZZANI, The European distribution system (ERS), in Actes du Colloque de Strasbourg, note 3, p. 115

¹⁹See the study of Logica Space and Communications Limited for Commission of European Communities:"Issues in Earth Observation data policy for Europe", executive summary, november 1992, study n° ETES-0018

²⁰See Martin, Droit des activités spatiales, note 7, p. 188

²¹Directive 96/9/CE of European Parliament and Council on the Legal Protection of Data Base, 11 march 1996, in O.J., L77/20, 27 march 1996; Initial Proposal: COM(92), 24 final, 393, 13 may1992, in OJ , C156, 23 june 1992, p. 4, modified proposal: COM(93) 464 final, 4 oct. 1993, in OJ, C 308, 15 nov. 1993, p. 1

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²³Art. 1 and art. 2 of directive; see

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²⁴94/911 EC, Dec. of Council, 15/12/1994, in OJ, n. L 361/1, 31/12/94

²⁵EEC 90/313, dir. of Council, 7/6/1990, in OJ, n.L 158, 23/6/90; see WINTER, Access of the Public to Environmental Data from Remote Sensing", in Actes du Colloque de Strasbourg, note 3, p.249

²⁶EC 94/90, dec. of Commission 8/2/1994, in O.J.n. L 46, p.58

²⁷Convention on Civil Liability for damage resulting from activities dangerous to the environment, open for signature at Lugano, 21/06/93, conditions for entry in force: 3 ratifications. Chart of signature by Council of Europa (05/03/96): 8 signatures (Cyprus, Finland, Greece, Iceland, Italy, Liechtenstein, Luxembourg, Netherlands). For the satellite images as a new method of proof for the defence of the environment see: COURTEIX, Vers la reconnaissance juridique d'un nouveau moyen de preuve pour la défense de l'environnement: les images satellitaire, in Revue franç. de droit aé. et spatial, 1995, p. 5

²⁸REVAH -CHEVREL, Mecanismes actuels de coopération dans le domaine de l'observation de la terre et perspectives, in Actes du Colloque de Strasbourg, note 3, p. 259

²⁹COURTEIX, Towards an international satellite monitoring system of the environment, in Proc. of the 33th Colloquium on the law of Outer Space, Dresde 1990, p.148; KOPAL, Vers une Autorité mondial de surveillance de l'Environnement, in Actes du Colloque de Strasbourg, note 3, p. 265; HASHIMOTO, Verification System from Outer Space. Revival of International Satellite Monitoring Agency, in Proc. or th 37th Colloquium on the Law of Outer Space, Jerusalem 1994, p. 250.