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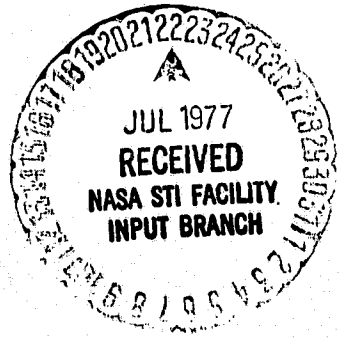
NASA TECHNICAL MEMORANDUM NASA TM-75028

THE ROLE OF SATELLITE OBSERVATIONS IN THE MANAGEMENT OF ENVIRONMENTAL RESOURCES, WITH PARTICULAR REGARD TO THE "AGRESTE" PROJECT

Gianna Calabresi

Translation of "Il Ruolo Della Teleosservazione Nella Gestione Delle Risorse Ambientali Con Particcolare Reguardo Al Progetto "Agreste", University of Rome, Department of Political Science, Report No. B/11156, 1975 - 1976, pp. 143 - 156.



NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
WASHINGTON, D.C. 20546 JULY 1977

STANDARD TITLE PAGE

1. Report No. NASA TM-75028	2. Government Accession No.	3. Recipient's Catalog No.
4. Title and Subtitle THE ROLE OF SATELLITE OBSERVATIONS IN THE MANAGEMENT OF ENVIRONMENTAL RESOURCES, WITH PARTICULAR REGARD TO THE "AGRESTE" PROJECT		5. Report Date July 1977 6. Performing Organization Code
7. Author(s) Gianna Calabresi		8. Performing Organization Report No. 10. Work Unit No.
9. Performing Organization Name and Address Transemantics, Inc. 1901 Pennsylvania Ave. NW, Wash., CE 20006		11. Contract or Grant No. NASw-2792 13. Type of Report and Period Covered Translation
12. Sponsoring Agency Name and Address National Aeronautics and Space Administration Washington, DC 20546		14. Sponsoring Agency Code

15. Supplementary Notes
Translation of "Il Ruolo Della Teleosservazione Nella Gestione Delle Risorse Ambientali Con Particcolare Reguardo Al Progetto "Agreste", University of Rome, Department of Political Science, Report No. B/11156, 1975 - 1976, pp. 143 - 156

16. Abstract

This paper deals with space technology and how satellite observations have allowed man to become so advance in his findings. By satellite, man is able to receive information regarding the earth's resources. The use of satellites has become of interest to other countries too, and because of this there is concern that the distribution of satellite information may reveal confidential military assets of a nation which could hamper its security.

17. Key Words (Selected by Author(s))	18. Distribution Statement
	Unclassified-unlimited

19. Security Classif. (of this report)	20. Security Classif. (of this page)	21. No. of Pages	22.
Unclassified	Unclassified	7	

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Academic year 1975/76

Conclusions /144

The LANDSAT program: past, present and future.

Man's knowledge of the natural resources at his disposal is somewhat limited, and it is even more so in the context of uncontrolled consumption of these same resources over a long period of time. The capacity for a sound management and conservation of the resources from which human existence depends is restricted to the application of a few major decisions.

In this regard, the LANDSAT program represents a major asset: it entails the fusion of space technology's satellite observations with /145 the inventory and management of the earth's resources. Five years after the introduction of this multidisciplinary experiment, conducted on a worldwide scale, it can be pointed out without qualifications that the results transmitted on a continuous basis by the two satellites have surpassed every imaginable expectation, demonstrating at the same time that the new system is well integrated with the traditional means of gathering information.

The fact that LANDSAT is capable of gathering information all over the earth has stimulated the interest of the international community: 130 different nations, whether through private firms or government agencies, have acquired LANDSAT data. Together with the several specialized agencies within the United Nations, over 50 nations have undertaken studies and research in collaboration with NASA in the multiple applications that the program allows.

Future NASA programs include the launching of a third LANDSAT by the end of 1977. The fourth LANDSAT will be orbited in 1981. /146 Other nations in possessions of a well-advanced space technology

such as the Soviet Union, Canada, Japan and India, with the eventual addition of Europe with the activities of the European Space Agency, are planning to launch their own satellites with multispectral scanning.

At the same time, the development of a network of land stations will allow for the use of 10/12 such stations by the end of the decade, capable of receiving information by satellites regarding the earth's resources. (1).

THE POSSIBILITY OF CREATING A GLOBAL SYSTEM OF OBSERVATION OF THE EARTH OF THE OPERATIONAL TYPE.

Of all the satellite systems so far launched, LANDSAT, even while in the experimental stages, has demonstrated a capacity to provide /147 benefits to mankind, in that it represents an invaluable aid to both the developed and underdeveloped nations. (1).

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(1) Together with Zaire and Iran, Norway, Venezuela, Thailand, Japan and India are also interested in building receiving stations. For her part, Australia will be building a station at Alice Springs.

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(1) AID- The United Nations Agency for International Development- has successfully applied LANDSAT data to agricultural projects and land planning in some developing countries.

In this context, the concern of those interested in the further development of management resources regarding the position of the United States on the future of satellite observations of the earth on a global scale is well founded; in other words, the question is being raised as to when, if at all, the experimental status of LANDSAT will be raised to a fully operational one as in the case with telecommunication satellites.

A fully operational system of observation of the earth's resources would be viewed with favor due to the substantial benefits that it /148
may bring to the international community. If approved, this new system may be managed either by the United States or by an international agency (as in the case of INTELSAT for telecommunications).

There is a third possibility whereby the United States may decide not to follow through with the program, either under an experimental or an operational basis, after the launching of LANDSAT-C (the third satellite in the series). This may lead, in turn, to the formation of a new agency, whether it be national, regional, or global in scope, for the express purpose of earth observations. In this case, this new organization will be forced to rely on the United States for satellite launchings in the immediate future, as that nation is the only one presently capable of carrying out such a task.

The positive results so far obtained, and the fact that a date has already been fixed for the launching of the third satellite, bring /149
a note of optimism with regard to the chances that the United States will continue the LANDSAT program, this in spite of the economic recession.

POSSIBILITIES FOR ITALY.

It has been pointed out how Italy, through the EARTH project of

Telespazio, is heavily involved in the LANDSAT program. An understanding of the fact that the new methodologies of satellite observations together with the electronic systems in use for the collection of data have led to a new approach in the management of the environment, has in turn brought to realization the first automatic LANDSAT data reception and interpretation center in Europe, at Fucino. Compared to the systems implemented in the United States, Canada and Brazil, the Italian one must be considered of the "second generation" in that, through the latest technological innovations, objectives so far unobtainable /150
even in the "pioneer countries"can be achieved . These objectives are: the speed with which data is obtained, and the possibility that the utilizer may interact directly with the system in order to obtain the desired results.

There has been great interest in Italy concerning her participation in this multinational and multidisciplinary program. The new experiences generated by this sector, and in conjunction with other means of obtaining information, opens the road toward new possibilities, among which is increased aid to the developing nations.

Furthermore, if as expected the number of receiving stations is to increase over the next few years, our country will become part /151
of a global network which, by avoiding overlapping of the areas covered by individual stations, will lead to coverage of the entire earth.

Finally, cooperation on an interdisciplinary basis will lead to the solution of problems that are vital both to Italy and to the international community.

OBSERVATIONS.

The international interest that has arisen from the LANDSAT

experiment is valid, as we have noted, not merely for its various possible applications but for its connection to the institution of an operational system of observing the earth's resources.

It was pointed out during the World Conference on Nutrition that took place in Rome in 1974 that the LANDSAT data used in the LACIE program (see Part 1- Chapter 4- Par. 4-1, p.68), for the determination and the forecasting of harvests, provided a /152 major contribution to the creation of a system that would insure a more equitable and efficient distribution of food at the disposal of those nations in need.

It is evident that no one is interested, nor is it expected, in halting the LANDSAT program. Still, it would be advisable to take note of the criticism voiced by a few nations regarding national security and possible economic exploitation, so that it may be established whether these complaints are of a purely political nature or if they in fact stem from the possibility of deteriorating strategic positions.

There is concern on the part of both developed nations such as Canada, France and the Soviet Union and some nations still in the developing stages that the satellite, by openly distributing its /153 information, may reveal the military assets of a nation, thereby hampering its national security, along with the extent of its natural resources, with conseguent economic damages.

In the first instance, even if the power of future LANDSATs will be increased to allow for further scientific applications, it is not expected to be so high as to permit, for example, the identification of troop movements. In order to accomplish the above, the satellite would have to orbit at such a low orbit that it would loose its scanning ability over vast areas and, consequently, its major use

(the observation of areas larger than those by means of aircraft, missile or stratospheric baloon). It is true that LANDSAT data may be used for strategic purposes such as cartography, control of road construction, location of airports and military installations.

In the second case, the one regarding economic ramifications, /154 the following may take place: a) a foreign mining company locates, by means of an analysis of LANDSAT information areas where it may be possible to uncover natural resources of which the country surveyed is not aware, thereby requesting mining rights both directly, and through a local subsidiary. The profits would go to a foreign company, with economic damages paid to the nation owning the land. (In this case it should be remembered that the host nation has many means at its disposal to control the activities of a foreign company, including expropriation); b) - a nation tries to raise the price of a product that it cultivates, on the international market, by suggesting that the said product was subject to a poor harvest, whereas in reality it was not: if other countries had at their disposal LANDSAT infor- /155 mation on that country, the latter would find it difficult to raise prices.

At the same time, one could give the example of a nation anxious to develop its industry that purposely avoids enforcement of anti-pollution regulations, thereby damaging the adjacent country. The latter, by utilizing LANDSAT information, may be able to identify the source of the pollution and request the payment for damages by the polluting nation.

In both cases, the international benefits deriving from the problem are evident, as compared to any national benefits. If use of the data may cause short-term damages to one country, an accurate accounting of harvests and pollution control may render greater advantages to humanity in the long run, if the main goals are to combat food shortages and insure that the environment is properly safeguarded.

Therefore, in the final analysis, until the United States- /156
in conformity with the task it has assumed regarding the distribution of the data acquired to all, as sanctioned by the "Freedom of Information Act"- will manage the satellites for earth resources, the principle of free distribution of all information gathered should continue to take place in the interest of the international community.