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DEVELOPMENT OF NATURAL RESOURCES

NATURAL RESOURCES SATELLITES

Report of the Secretary-General

Addendum

1. At its forty-eighth session, the Economic and Social Council gave preliminary consideration to the report of the Secretary-General on natural resources satellites (E/4779) and in operative paragraph 2 of its resolution 1480 (XLVIII), the Council requested the Secretary-General "to bring the report to the attention, for information and possible comments, of the Committee on the Peaceful Uses of Outer Space, the Advisory Committee on the Application of Science and Technology to Development, and other interested organizations of the United Nations system". The comments of the Advisory Committee on the Application of Science and Technology to Development, and of the Scientific and Technical Sub-Committee of the Committee on the Peaceful Uses of Outer Space, were brought to the attention of the Council at its forty-ninth session, in an addendum to the Secretary-General's report (E/4779/Add.1).

2. In addition to the two organs referred to above, the Secretary-General's report was also distributed, on 15 May 1970, to sixteen other organs and organizations within the United Nations system, together with an invitation to comment on the report. Those thus approached were the following:

Economic Commission for Africa

Economic Commission for Asia and the Far East

Economic Commission for Europe

Economic Commission for Latin America
Economic and Social Office in Beirut (UNESOB)
United Nations Industrial Development Organization (UNIDO)
United Nations Development Programme (UNDP)
International Labour Organisation (ILO)
Food and Agriculture Organization of the United Nations (FAO)
United Nations Educational, Scientific and Cultural Organization (UNESCO)
International Civil Aviation Organization (ICAO)
International Bank for Reconstruction and Development (IBRD)
International Telecommunication Union (ITU)
World Meteorological Organization (WMO)
Inter-Governmental Maritime Consultative Organization (IMCO)
International Atomic Energy Agency (IAEA)

3. Of the above bodies, four did not respond and five acknowledged receipt of the report, but had no comments to offer. The secretariats of the remaining seven submitted comments which are reproduced in full in the annex to this report.

Annex

COMMENTS OF INTERESTED UNITED NATIONS AGENCIES

Comments of the secretariat of the Economic Commission for Asia and the Far East

While the use of space satellites for resources surveys has great potential, the practical applications are still in the development stage, and unless its value is actually demonstrated by the discovery of resources through space satellites, developing countries would think twice before investing part of their limited resources in the development of a technology, the rewards from which are still conjectural. If priorities are considered by developing countries among a number of possible alternatives, the choice would be those projects which have the greatest promise of yielding economic returns soonest. In most developing countries, there are already known prospects awaiting exploration and development, but left idle for lack of venture capital. At this stage therefore, developing countries may not be expected to contribute much to the development of new technology.

Since the use of space satellites for resources survey is still experimental, it might be premature to establish "a centre of competence" at the moment. Only a few of the most advanced countries are probably engaged in the development of the technology, and it is doubtful if those countries would be willing to share the knowledge of the present state of development of their experiments, for co-ordination by the centre of competence. It would of course be desirable, even ideal, for the United Nations to have the pioneering role in the development of space technology. In fact, however, the United Nations has limited resources and whatever development in technology is expected will be by the most advanced countries.

It would perhaps benefit the developing countries more and sooner if the limited resources of the United Nations were applied to activities that would bring to those countries the already developed methods for surveying, prospecting, exploring and developing their resources. The ground and airborne methods of surveys and the use of remote sensors have not been fully used by the countries yet.

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The developing countries should be given the opportunity to acquire the capabilities of using these methods and techniques through training, seminars, symposia, roving teams of experts and other means. All these activities will serve as preliminary steps to the use of space satellites for natural resources surveys when its practical application has been established.

It would, however, be advantageous if a seminar were held to acquaint the developing countries of the present state of application of space satellites and also of the potential areas of application. Through these media the advanced countries could share whatever knowledge they are willing to share with the developing countries in regard to the use of space satellites for resources surveys. In this connexion, it is noted that (see p. 3 of the Report of the Secretary-General) the Resources and Transport Division has on its work programme an interregional seminar on aerial and satellite survey methods for mapping and resources inventories. It will be recalled that the ECAFE secretariat had a similar seminar in its work programme in 1968 and which was to be held in 1969. This was cancelled due to lack of resources. We would be willing to co-operate in holding the interregional seminar within the limits of our resources.

5 June 1970

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Comments of the International Telecommunication Union

We have studied this interesting report with great care. Since it confines itself for the moment to considerations of a rather general nature on natural resources satellites, we should like to restrict our comments to a single remark.

Paragraph 5 of the report rightly refers to the existence of economic and technical limitations on this type of sensing. Among these should be mentioned the various limitations which may arise from the fact that the information acquired by satellite will be transmitted to earth stations by radio. This, as you are undoubtedly aware, is one of the subjects with which ITU is concerned. Studies on satellite radio-communication problems are dealt with in the ITU, International Radio Consultative Committee (CCIR), while the regulatory aspect of those problems will be studied at the World Administrative Radio Conference for Space Telecommunications, due to open at Geneva on 7 June 1971.

We do not think it necessary at this stage to go into more detail on these matters; we believe that you will be able to find some information on ITU's role in space in certain documents of the Committee on the Peaceful Uses of Outer Space, particularly from document A/AC.105/77 (chapter II, section A) (a photocopy in French and one in English are enclosed herewith).

It would appear important that ITU should in due course be associated with these studies, and in particular that it should have the opportunity to be represented at meetings where problems within its competence might be dealt with.

10 June 1970

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Comments of the secretariat of the Economic Commission for Latin America

We consider that the survey of natural resources by means of artificial satellites opens up interesting prospects for the future of which the United Nations should take full advantage. On the whole, however, we agree with point 102 of the Secretary-General's report:

It is still too early in the development of the earth-resource satellite to define precise training programmes for specific applications.

Moreover, our attitude is influenced, first, by the limitations which the present financial position of the United Nations imposes on its activities, and secondly, by the fact that the developing countries can do so little in this field owing to their shortage of trained technical personnel and of capital.

We believe that if advantage is to be taken of the natural resources of the Latin American countries as a dynamic factor in their development, there are other measures to which higher priority should be given.

For example, selected areas could be surveyed and studied with a view to identifying specific strategic projects designed to attain objectives of general interest, such as growth of production, fairer income distribution, more balanced spatial development and expansion of exports.

We therefore consider that the United Nations should not be too active in this field for the present, since the Great Powers will in any case carry on with pertinent scientific and technological research. Its role should be rather to keep informed about the progress made in those techniques, their possible applications in developing countries, their costs etc., with a view to the transfer of such knowledge and the promotion of its use at the right time and in the right place.

Accordingly, we think that the United Nations Resources and Transport Division might, at least at the outset, undertake the relevant tasks, including the preparation of a first document summarizing the present situation, the possibilities offered by satellites for acquiring knowledge of natural resources and the prospects for the Second Development Decade, besides providing information on the current use of satellites in connexion with meteorology in developing countries (Tiros, Nimbus and ESSA), in co-ordination with the World Meteorological Organization (WMO).

11 June 1970

Comments of the World Meteorological Organization

As is indicated in paragraph 7 of document E/4779, the annex to the document focuses its attention on earth resource satellite (ERSAT) development and applications as distinct from, amongst others, satellite applications to weather forecasting. While it is true that the most obvious application of the meteorological satellite (METSAT) programme lies in the field of weather forecasting, it should also be noted that many of the applications attributed to ERSAT are already well advanced in the development of the METSAT programmes. In particular, these include the acquisition of data of value in hydrological analyses, oceanographic studies and studies of atmospheric and marine pollution.

Measurement of a number of the parameters, mentioned in paragraphs 42 (surface water distribution, snow cover, distribution and movement of ice masses, snow depth, atmospheric conditions and surface temperatures), 70 (ice surveillance, sea-state survey and atmospheric and water pollution surveys) and 72 (observations of natural phenomena and disasters such as floods, hurricanes and typhoons, tsunamis and spills of pollutants) have obvious meteorological implications and are, in fact, being developed within the METSAT programme. It, therefore, seems inevitable that there will be a degree of overlap of the applications of the ERSAT and METSAT programmes since meteorological satellites will have a role to play in the measurement of earth resources and earth resources satellites will have a corresponding role to play in the measurement of meteorological parameters. The primary concern, however, is that the information acquired by whatever programme should be channelled in the right direction, e.g. meteorological information obtained through the ERSAT programme should be made available to those who have need of the information for meteorological purposes.

In view of the very likely probability of overlap in the roles of the ERSAT and METSAT programmes, close co-ordination and co-operation will be necessary between the World Meteorological Organizations and the United Nations body responsible for the earth resources satellite programme. In this connexion, a sub-committee of the United Nations Committee for the Peaceful Uses of Outer Space might be given responsibility for necessary planning and co-ordination

of all activities relating to the ERSAT programme. Alternatively the ACC machinery could be used for this purpose. The main thing is that the arrangements provide for the necessary internal co-ordination within the United Nations and for co-ordination with those specialized agencies concerned with satellite application in the fields of communications, meteorology and other aspects of the peaceful uses of outer space.

15 June 1970

Comments of the United Nations Development Programme

In general the Administrator has followed developments with regard to the general applicability of satellites in development work with keen interest. As you know, UNDP has already developed some experience with the project in India for research and training on the use of satellite communication in Ahmedabad, India (IND 44) - a project executed by ITU; which is likely to enter a second phase shortly.

Our first comment is that it is becoming increasingly apparent that satellites, with their varied applications for development purposes, interest a considerable number of agencies. To prevent duplication and overlapping and the undue overhead which could result, it is already clear that an interdisciplinary, multi-agency approach may be required. Indeed the report notes, in paragraph 93, that "the administrative position and arrangements for the multi-disciplinary application" are "much less clear...". UNDP has close interest in whatever results from these recommendations especially in view of the special technical aspects of satellite sensing devices.

It is immediately apparent that there is a wider scope for the use of survey satellites and indeed sensing in general, than for the non-agricultural natural resources (as defined in paragraph 2 of the report). Indeed, the same report later (in paragraph 28) notes that aerial photography can be used for surveys in many fields such as "topographic mapping, soil surveys, land use mapping, crop inventories and forecasts", etc. In this connexion we have noticed a disinclination for various reasons within the United Nations to make full use of available remote sensing devices. We believe that this wide scope, as defined in the body of the report, rather than the restrictive scope mentioned in the introduction, should be the guiding basis for the setting up of international machinery. Any attempt artificially to divide up the field e.g. between Natural Resources (United Nations), Agriculture (FAO), and Telecommunications (ITU), could only lead to the administrative confusion and financial duplication that we all wish to avoid. Moreover we believe that a clear distinction should be made between remote sensing from satellites and from aircraft in terms of scale of operations.

18 June 1970

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Comments of the United Nations Educational, Scientific and Cultural Organization

(a) If one excepts meteorology and geodesy, there appear to be very few earth resources studies to be made from a satellite which could not be made from a high altitude aircraft.

(b) The advantages of using high altitude planes are obvious since they do not raise sovereignty or legal problems (each country could eventually have its own planes) and since they bring back to earth the photographic or scanning films, thus giving much better definition and working material than television transmissions from satellites.

(c) It is difficult to imagine any serious natural resources problem in any developing country which could actually be solved by the use of a natural resources satellite - aside of course from the problems of meteorology and perhaps some allied problems in hydrology, which are not the objectives of ERTS.

(d) It is clear that satellite technology offers many possibilities for future uses, some of which could be of real interest; a clear distinction should be made between the interest of scientists, technologists and industrialized groups in promoting frontier techniques, and the actual needs and practical utilizations which might come from these techniques.

(e) The report should also mention the interest of the specialized agencies in resources surveys, for example the pioneer activities of UNESCO in the methodology of surveys (including the 1964 Toulouse Conference on aerial survey methods) and the interests of all specialized agencies in the use of remote sensing, whether from satellites or otherwise.

(f) The specific proposals made in the last chapter of the report should be assessed in the light of the above considerations, as they may be considered premature and prejudging the actual need for resources satellites, particularly in relation to developing countries. It is essential not to repeat the mistakes made about electron microscopes, radio isotopes and nuclear plants which were also presented in the past as "magic tools" in assisting developing countries. The final recommendation of the report is sound, and the idea of optimum use of remote sensing methods in developing countries is already included in the proposed 1971/1972 UNESCO programme.

19 June 1970

Comments of the Food and Agriculture Organization of the United Nations

I have noted with satisfaction the clear recognition given in the report to the fact that space research and development, and the interpretation of remotely-sensed data, involves a multidisciplinary approach. I therefore welcome the Council's reference to the need for consultation with Organizations of the United Nations system concerned in further elaboration of a programme of action in this sector. High among the uses for remotely-sensed data, when the first Earth Resources Satellite goes into orbit in 1972, are those in the fields of competence or interest of FAO. I refer especially to: topographic mapping, soil survey, land-use mapping, crop inventories and forecasts, animal habitat studies, hydrological survey, forest inventory and management, coastal erosion, fisheries, studies in pollution, in water and in oceanography.

I therefore hope that every effort will be made to ensure the fullest possible consultation with FAO and other bodies concerned at the earliest stage in every successive step in developing such a programme. In this context, I am happy to recognize the initiative already taken by the United Nations and FAO in convening a panel at FAO headquarters in Rome in September 1971 to discuss the applicability of these new techniques to the management of food resources.

As has been noted in the annex to this well-written report, the application of resource-satellite technology will be extremely costly. Initiatives and action in this respect will thus be very largely in the hands of leading-member States; and the role of the United Nations system will be, in the main, restricted to co-operation in the interpretation of remotely-sensed data; that is its adaptation and application as a tool to the developmental needs of developing countries. This once again underscores the fundamental importance of the closest consultation possible with the agencies, since such interpretation involves highly-qualified technologists in each major discipline.

One last comment I would make is in respect of the need for a central unit with initial functions of planning, consultation and education to meet world-wide needs. This is a useful suggestion, for as the report rightly stresses, a

multidisciplinary programme of this breadth requires "a systems approach and a central authority to co-ordinate research and development from concept to application". At the same time, I lay very great importance on the elaboration of arrangements that, whilst ensuring close liaison with the agencies, avoids all duplication of technical staff and work in their respective fields of competence. Such a central unit should therefore, in the interests of economy, refrain from engaging in operational activities in the fields of application of data to developmental needs; and should, rather, encourage the fullest utilization of the resources and competence of those specialized agencies concerned.

I look forward with confidence to enhanced mutual collaboration with the United Nations in this promising sector.

1 July 1970
