

**Committee on the Peaceful
Uses of Outer Space***Unedited transcript*590th Meeting

Tuesday, 17 June 2008, 10 a.m.

Vienna

Chairman: Mr. Ciro Arévalo-Yepes (Colombia)

The meeting was called to order at 10.17 a.m.

The CHAIRMAN (*interpretation from Spanish*): Good morning distinguished delegates, I now declare open the 590th meeting of the Committee on the Peaceful Uses of Outer Space.

This morning we will first consider item 14, Other Matters, related to the proposed Strategic Framework for the Programme on the Peaceful Uses of Outer Space for the period 2010-2011. By now, as I understand it, this has been distributed in all official languages.

We will then continue and hopefully conclude agenda item 8, Report of the Scientific and Technical Subcommittee on its Forty-Fifth Session. We suspended our consideration yesterday pending the Secretariat's response regarding the non-paper on Proposed Guidelines for Selecting and Setting up UNSPIDER Regional Support Offices.

We shall also and hopefully conclude items 9, Report of the Legal Subcommittee on its Forty-Seventh Session, and 10, Spin-Off Benefits of Space Technology: Review of Current Status.

Time permitting, we will continue our consideration of agenda item 11, Space and Society, and we will begin our consideration of agenda item 12, Space and Water.

Following the plenary, there will be four technical presentations. The first one by a representative of the Russian Federation, entitled "Presentation of the Draft Treaty on the Prevention of

the Placement of Weapons in Outer Space: The Threat or Use of Force Against Outer Space Objects".

The second one by a representative from the Indian delegation on "Space for Societal Applications: Indian Context".

The third presentation will be by a representative of Japan entitled "JAXA Industrial Collaboration Programme".

And the final presentation will be by a representative of Germany discussing "Space Perspective on Ocean and Inland Waters".

I would also like to remind delegates to provide the Secretariat with any corrections to the provisional list of participants, Conference Room Paper No. 2, so we can finalize the list. Please submit corrections by the end of this meeting.

Other matters (agenda item 14)

Distinguished delegates, let us now continue with agenda item 14, Other Matters, in relation to the proposed Strategic Framework for the Programme on the Peaceful Uses of Outer Space for the period 2010-2011. This is document A/63/6/PROG.5. I understand that this has been distributed in all languages to delegations.

Now let me ask if all delegations have this document. You may remember we began to discuss this document yesterday afternoon.

I take it then that everyone has a copy of the document and I take it that the Committee agrees with the proposed Strategic Framework for the Programme

In its resolution 50/27 of 6 December 1995, the General Assembly endorsed the recommendation of the Committee on the Peaceful Uses of Outer Space that, beginning with its thirty-ninth session, the Committee would be provided with unedited transcripts in lieu of verbatim records. This record contains the texts of speeches delivered in English and interpretations of speeches delivered in the other languages as transcribed from taped recordings. The transcripts have not been edited or revised.

Corrections should be submitted to original speeches only. They should be incorporated in a copy of the record and be sent under the signature of a member of the delegation concerned, within one week of the date of publication, to the Chief, Conference Management Service, Room D0771, United Nations Office at Vienna, P.O. Box 500, A-1400, Vienna, Austria. Corrections will be issued in a consolidated corrigendum.



on the Peaceful Uses of Outer Space 2010-2011 in its amended form, following yesterday's discussions?

It is so decided.

Report of the Scientific and Technical Subcommittee on its forty-fifth session (agenda item 8)

Now, we move on the report of the Scientific and Technical Subcommittee on its Forty-Fifth Session, agenda item 8.

I have the distinguished delegate from Colombia on my speakers list, you have the floor Joaquín Restrepo.

Mr. J. RESTREPO (Colombia) (*interpretation from Spanish*): Thank you very much Chair. Sorry to take some time. We wanted to have a review of the main points of the report of the Scientific and Technical Subcommittee on its forty-fifth session.

Generally speaking, Colombia supports the general statement number 16 on the need for the Legal Subcommittee to look at the issue of rights of States to address itself to issues such as the space objects that have been damaged and applicable under international law.

Concerning coordination of space activities in the United Nations System. Colombia wishes to ask that in the twenty-ninth session we have a report on the benefits of space technology for sustainable development in Latin America in cooperation with the Space Conference of the Americas in order to promote the use of these technologies in strategic areas for the sake of national and regional development under Earth observation systems concerning the United Nations Programme on Applications of Space Technology concerning the importance of practical training programmes under this United Nations Programme for developing countries. We recommend that we establish relations of cooperation with countries of Latin America so that they might re-strengthen their research centres and work on the priority thematic areas established by the Programme.

We would also ask that through our Space Agency we have classes and seminars on satellite navigation, remote sensing, satellite observations, structuring of space data for purposes of management of natural resources, environmental protection and disaster management, amongst others.

We want to receive support from the United Nations through programmes of scholarships and grants so that students can participate in these experimental courses and projects having to do with the technological infrastructure that exists in Colombia.

Concerning satellite observation, the applications for developing countries, we take note of the importance of providing non-discriminatory access to remote sensing data and to derived information for peaceful purposes. We also ask for full availability on the Internet of high-resolution imagery of the sensitive areas. Here we propose that guidelines consistent with national policies be developed within the framework of national infrastructures since we have seen a lot of breakthroughs here and interlinking with telecommunications, which means that there will be a growing market for geographical information and we want a facility to the integration of Internet applications.

Concerning disaster management, we wish to see an increase in availability and applications using space technology in terms of disaster management support. We are very pleased to see the work of the Andean Committee for the Prevention and Management of Disasters and ask that this be supported. The idea here is to reduce the vulnerability of people and property exposed to natural disasters so that they might promote sustainable development in the Andean region.

Concerning recent developments in global navigation satellite systems, Colombia would like to submit that we programme the holding of different seminars, workshops and classes on the benefits and applications of global navigation satellite systems again for the sustainable development of different regions of the world, assistance for our own Regional Centre would be important.

Concerning the proposed programme for the forty-sixth session, application of the conclusions of UNISPACE III, mentions this same subject, use and application of satellite navigation systems on behalf of sustainable development and capacity-building in this field. To achieve these objectives, we need to quality data on a timely basis. We have a provisional plan for the thirty-sixth session of the Scientific and Technical Subcommittee asking that we include international cooperation as one of the topics on its agenda. This will allow us to further apply this to sustainable development under COPUOS especially concerning technical and strategic topics dealt with.

Last but not least, concerning the geostationary orbits, this XI on the document. Here, Colombia, first of all, wishes to remind delegates the use of geostationary orbit is mainly for the use of fixed satellite telecommunications purposes, which are the only alternative in many remote sites for telecommunications, both in developed and developing countries. So it is a *sine qua no(?)* condition for long-distance education and medicine and just citizens' participation in society and also is to cover all parts of the world.

Now, in this respect, this kind of digital integration of these remote peoples is something that makes this geostationary orbit issue so important. Consequently, a reduction of the digital gap depends on the use we make of this geostationary orbit. So this cannot just be limited to market forces. In those areas where we have large private markets, these may be legitimate but we must also be able to take into the equally legitimate social needs of different peoples. This is one of the problems we have with the market here that is growing in cost, for example, rental of satellite capacity in Latin America has doubled in the last five years and it is becoming a rarer and rarer resource. For example, the offer now in the Ku-Band in the Andean region is completely saturated. So the use of geostationary orbit has to take this into account. We must bear in mind that the attribution of resources under the geostationary orbits, these frequencies should follow procedures set forth by the Radiotelecommunications Code of the ITU and that we have to continue to have the synergy between the ITU and COPUOS so that the necessary adjustments be made to this Code. We should not forget that the geostationary orbit is a natural resource. It is non-renewable, it is rare. And as the ITU has said, both in its Constitution in Article 44, as well as in its Radiocommunications Code, it has to be efficient, economic and equitable in use to take into account the needs of the developing countries.

And this is the point we want to draw your attention to. How we are going to use the geostationary orbit to meet the developing countries needs, how it can contribute to the reduction or the narrowing of the digital divide in that it is broadening. Colombia will continue to work on this issue, both in COPUOS as well as in the Scientific and Technical Subcommittee as well as in the ITU where this has been included as a study point, through the amendment to resolution 80 that was considered during the last meeting of the ITU and will be discussed again during the next Radiotelecommunications Conference of the ITU, as well as within for a Working Group on efficient use of the geostationary orbit and its spectrum

in the Radio Section of the ITU. At least this is what came out of the first Preparatory Meeting of the 2011 preparations and the Advisory Group on Radio.

So we have an excellent area in which to work together on this issue, both in COPUOS and ITU and we reiterate the invitation to all countries in this respect since these are both open-ended fora. Colombia will continue to work on the development of this tool for the analysis of the use of geostationary orbit, GOAT, Geo-Occupancy Analyzer Tool, and which will be very useful in looking at any possible modifications that will be required to radiocommunications here to strike the adequate balance between the commercial and social, between the private and public in using this resource.

It is absolutely fundamental that the Scientific and Technical Subcommittee keep on considering this issue in order to strengthen the ITU/COPUOS synergy here on an issue which is so important since geostationary orbit will allow us to reach the objectives set forth in the World Information Summit and in reducing the digital divide and help contribute to reaching the MDGs. Thank you very much.

The CHAIRMAN (*interpretation from Spanish*): Let me thank Dr. Joaquín Restrepo from the Colombian delegation.

Perhaps we can conclude our consideration of agenda item 8 during this session.

If delegates would agree, let me give the floor to the Director of the Office for Outer Space Affairs, Dr. Mazlan Othman, to address the issues raised yesterday morning regarding the non-paper on proposed guidelines for selecting and setting up UNSPIDER Regional Support Offices. Dr. Othman, you have the floor.

Dr. Othman is telling me that we are currently distributing the document that contains the different amendments so delegations can avail themselves of this in giving their repositions. So let us wait just a few minutes until everyone has the document before them.

I understand that everyone has the document before them. You have the floor Madam.

Ms. M. OTHMAN (Director, Office for Outer Space Affairs): Mr. Chairman, there is so many there that have not received it.

The CHAIRMAN (*interpretation from Spanish*): I think we are running short of copies. What happened is we began to distribute these to observers and we should have begun with delegations. So let me ask the Secretariat to redistribute these. Delegations are our priority here.

This is not to be discriminatory to our observers. Obviously we want you to be part and parcel but let me ask for a little bit of patience that at least we get the other copies to come into the room and distribute them.

Thank you for your patience. I am sure the wait was worth. We will now begin our discussion with a presentation of the document by Dr. Othman.

Ms. M. OTHMAN (Director, Office for Outer Space Affairs): Thank you Mr. Chairman for giving the Secretariat the floor again.

Distinguished delegates, we have endeavoured to take into account the views expressed in the Committee in the revised version of the non-paper. In the first paragraph, here the Office for Outer Space Affairs sets up the Regional Support Office in consultation with the respective regional group.

The second paragraph refers to the utilities and the infrastructure that should be provided by the Regional Support Office, together with the Human Resources, in order to take part in the UNSPIDER relevant activities, as well as support to other activities that would be carried out by the other Regional Support Offices.

The third paragraphs refers to the actual process of the Regional Support Office going into agreement with the Office for Outer Space Affairs.

The fourth just really states that the Office will report to the Scientific and Technical Subcommittee on the activities of the Regional Support Office.

The fifth requests that the Office will consult now with the Regional Group of African States regarding the offers that have already been made by Nigeria and Algeria. Thank you Mr. Chairman.

The CHAIRMAN (*interpretation from Spanish*): I thank the Director of the Office and let me first turn to delegates to ask for your opinions of the non-paper.

The United States.

Mr. K. HODGKINS (United States of America): Thank you Mr. Chairman. Mr. Chairman, I appreciate the work on the part of the Office for Outer Space Affairs as well as the Director of the Office in clarifying some of these plights. I had just two questions about the revised paper. The first one is, in paragraph 1, when we talk about a group of members States, now does that mean just separate member States but could that include regional organizations that are already in existence like, for example, ESCAP, I mean would ESCAP be able to serve as the Regional Support Office, for example? Or is this strictly among a group of member States that come together to some other mechanism rather than to an existing one?

And then paragraph 4, my delegation notes that we have dropped the idea of reviewing the agreement after a period of, well we knew in the agreement after a period of three years and then after six years, looking at whether this particular Regional Support Office should continue. So that my question is, are we dropping the idea of some sort of a sunset clause for the relationship between SPIDER and the Regional Support Office? Is this an open-ended commitment that a country will be taking on when they decide to be a Regional Support Office? The idea of maybe we are giving a country the opportunity to opt out of the agreement at some point, that they find that they it is either not working or that they do not have the funds for it. Thank you Mr. Chairman.

The CHAIRMAN (*interpretation from Spanish*): The Director has the floor.

Ms. M. OTHMAN (Director, Office for Outer Space Affairs): Thank you Mr. Chairman. With regard to the involvement of the regional organizations, the wording by a member State or group of member States allows for the regional organizations to be proposed either by a member State or a group of member States as allowed by each individual organization's Constitution. We do not know which particular regional organization could be a particular member State that could make the proposal but for other regional organizations, their Constitution dictates that a group of member States within the regional organization must make the position. So either by a member State or a group of member State the regional organizations can be proposed.

With regard to the sunset clause, in paragraph 3, it is stated there that there will be an exchange of letters between the Office for Outer Space Affairs and the entity and we propose to include the sunset clause within the exchange of letters because for some

proposals they might want to operate for three years and some for six years, that will depend on the situation and that will be covered in the exchange of letters that will ensure that there is a sunset clause for both sides. Thank you Mr. Chairman.

The CHAIRMAN (*interpretation from Spanish*): I thank Dr. Othman for that clarification. I hope that allays any concerns and let me reiterate our gratitude for her clarifications here and any illustrations on this very important topic.

May I take it that the Committee agrees with the guidelines as proposed for selecting and setting up UNSPIDER Regional Support Offices in this amended form?

It is so decided.

Thank you.

Report of the Legal Subcommittee on its forty-fifth session (agenda item 8)

Now, let me continue our work on agenda item 9, Report of the Legal Subcommittee. I think that we can say that we have concluded agenda item 8, Report of the Scientific and Technical Subcommittee on its Forty-Fifth Session.

Now under 9, my first speaker is the distinguished representative of India, Mr. Radhakrishnan. You have the floor.

Mr. K. RADHAKRISHNAN (India): Thank you Mr. Chairman. Mr. Chairman, the Indian delegation considers the contribution of the Legal Subcommittee over the years in developing the international legal regime of outer space as very important. In our view, the Legal Subcommittee plays a very leading and prestigious role involving and safeguarding the entire body of international space law and just founded on ethical principles.

Mr. Chairman, we reaffirm that the five United Nations treaties evolved to a consensus and accepted by a large number of countries, constitute the cornerstone of the international space law. The review of status and application of the five United Nations treaties on outer space, therefore, is an important subject to encourage adherence to this by the States which are yet to become parties to them.

The Indian delegation is of the view that the GSO is an integral part of outer space and is thus governed by the Outer Space Treaty. The continuing

debate on this subject and on the subject of the definition and delimitation of outer space, it is crucial to arrive at a common understanding.

Mr. Chairman, we had earlier announced about an initiative undertaken by the Indian Space Research Organization towards capacity-building in the field of international space law. We continued and strengthened that initiative during the last year.

Mr. Chairman, we are happy to note that during the forty-seventh session of the Legal Subcommittee, the International Institute of Space Law, IISL, and the European Institute of Space Law, jointly organized a Symposium on Legal Implications of Space Applications for Global Climate Change. The Symposium proved to be useful and informative.

Mr. Chairman, during 24-27 September 2007, India hosted the fifty-eighth IESC(?) in Hyderabad, under the umbrella of the International Astronautical Federation, the International Academy of Astronautics, and the International Institute of Space Law.

Two other very unique events, in the _____(?) of space law, the fifty-eighth Space Colloquium and the fortieth year of the Outer Space Treaty were also held along with this event.

Mr. Chairman, the Indian delegation attaches very high importance to the subject of space debris, that space debris is an issue in ISRO has been addressed in the design and operational phases of its launch vehicle and satellite programmes. The reduction of space debris it is of utmost importance as it poses a great threat to all space assets. International cooperation is needed and appropriate and affordable strategies are to be formulated to minimize the impact of space debris on future space missions. India considers that the principle of common but differential responsibility should be adopted. This means that those countries which are largely responsible for the creation of space debris and those who have space capabilities, should contribute to the debris mitigation efforts in a significant manner, compared to other countries.

Mr. Chairman, in conclusion, the Indian delegation would like to reiterate its commitment to the use of outer space for peaceful purposes in the common interest of mankind. We support development and continuous evolution of law for the peaceful use and exploration of outer space so as to ensure benefits to all countries. We are of the view that the sovereign right of every country to have access to space and the opportunity to utilize space for

development programmes should be well respected. It is in this context that the safety and security of space assets should be well-preserved for the better prosperity of mankind.

The Indian delegation is very pleased with the progress of significant achievements made during the forty-seventh session of the Legal Subcommittee. We endorse the report of the Legal Subcommittee. Thank you Mr. Chairman.

The CHAIRMAN (*interpretation from Spanish*): Let me thank Mr. Radhakrishnan from the Indian delegation for that statement.

I now give the floor to Gabriella Arrigo from the Italian delegation.

Ms. G. ARRIGO (Italy): Thank you Mr. Chairman. Mr. Chairman, under agenda item 9, the Italian delegation would like to congratulate Professor Vladimir Kopal as Chairman of the Legal Subcommittee, convinced that under his leadership, the Subcommittee will mark important success.

Mr. Chairman, the Italian delegation supports the efforts undertaken under agenda item 6 of the Legal Subcommittee by the Working Group on Status and Application of the Five United Nations Treaties on Outer Space, under the chairmanship of Mr. Vassilios Cassapoglou.

The launching(?) of a State that has not yet signed nor ratified the Moon Treaty, my delegation is particularly interested on the debate concerned with the reasons why only a limited number of countries have accepted the 1979 Treaty.

We are convinced, Mr. Chairman, that the new perspectives concerning the colonization of the Moon and the use of the Moon as a base for exploring the deep space, call upon a frank discussion on whether the Moon Treaty contains still valid solutions or regardless of a shaping in order to adapt it to the new frontiers of space law, taking into account not only the previous Law of the Sea, but also other international legal regimes concerning aerospace(?) - owned(?) national jurisdictions.

Mr. Chairman, with regard to the examination on the view of the development concerning the draft Protocol on Matters Specific to Space Assets to the Cape Town Convention on International Interests in Mobile Equipment, you are aware that the Italian Government has supported from the beginning the work done by UNIDROIT in this field.

During 2007, we seconded all the initiatives aiming at allowing an annual meeting of the UNIDROIT Committee of Governmental Experts on the Space Assets Protocol which held its last session in October 2004.

In this line, the Italian delegation welcomes the encouraging results of the first meeting of the Steering Committee held in _____(?) last May 2008 under the chairmanship of Professor Sergio Marchisio, in order to build consensus on important urgent issues such as the sphere of applications of the draft Protocol and to envisage the steps to be taken with a view to bringing the said Protocol to the final completion.

We are informed that such a roadmap has been agreed upon so that the third session of the Intergovernmental Committee of Experts will most probably be convened in Rome in late spring 2009.

Mr. Chairman, with regard to the new items included in the agenda of the Legal Subcommittee, the Italian delegation welcomed the endorsement by the General Assembly of the Space Debris Mitigation Guidelines approved by the COPUOS.

Italy is highly committed to implement on a voluntary basis space debris limitation and mitigation measures. We are convinced that additional efforts should be made in the field in order to ensure that said activities in outer space for all countries _____(?) from _____(?) indifference in conformity with Article 9 of the Outer Space Treaty.

In this framework, we proposed the inclusion of a new agenda item concerning general exchange of information on national mechanisms relating to space debris mitigation measures, co-sponsored also by Ukraine.

We are particularly pleased that the consensus has been reached in this new one-year single issue item and we take this opportunity to thank all delegations who played an active role in helping to reach the consensus and those who supported this effort. We are ready to actively contribute in this debate next year.

Mr. Chairman, among the items of the Legal Subcommittee agenda, the Italian delegation fully supports the ongoing work concerning capacity-building in space law as a new single issue and the preparation of a curriculum for a classic(?) course on space law to be included in the education programmes

of the Regional Centres on Space and Technology Education affiliated to the United Nations.

In this framework, Mr. Chairman, I am pleased to inform you that next September, the University of Genoa, in Italy, will host the European Space Law Summer Course where 50 students from all European universities will participate. Thank you Mr. Chairman.

The CHAIRMAN (*interpretation from Spanish*): Let me thank the Italian delegation for that statement.

I now give the floor to Joachim Marschall from Germany. You have the floor Sir.

Mr. J. MARSCHALL VON BIEBERSTEIN (Germany): Thank you Mr. President. Mr. Chairman, distinguished delegates, my delegation would like to express its satisfaction about the achievements of the forty-seventh session of the Legal Subcommittee. We would like to commend the able leadership of its Chairman, Vladimir Kopal, and the excellent work of the United Nations Office for Outer Space Affairs staff.

Mr. Chairman, the German delegation attaches great importance to the work of the United Nations COPUOS Legal Subcommittee. In this connection, we welcome the adoption of the General Assembly resolution 62/101 of 17 December 2007 entitled "Recommendations on Enhancing the Practice of States and International Intergovernmental Organizations in Registering Space Objects", which have been elaborated and adopted by the United Nations COPUOS Legal Subcommittee in consensus last year under the chairmanship of Professor Kai Uwe Schrögl of Germany.

This resolution contributes to a greater transparency in national and international registration factors according to the Registration Convention, taking into account new developments in the exploration and use of outer space, especially with respect to the commercialization, diversification and privatization of space activity.

Since many States are in the current process of elaborating national space legislation, it was high time to agree on specific elements in this respect on an international level. Therefore, the German delegation hopes that the recommendations, as contained in this resolution, will be implemented soon by the actors addressed in the resolution, namely States,

international governmental organizations, as well as the United Nations Office for Outer Space Affairs.

Mr. Chairman, the German delegation also welcomes the adoption of the Space Debris Mitigation Guidelines, which have been adopted by the United Nations COPUOS in 2007 and were subsequently endorsed by the United Nations General Assembly in resolution 62/217 entitled "International Cooperation in the Peaceful Uses of Outer Space" of 21 December 2007, paragraph 26, without a vote.

The German delegation attaches great importance to the adherence to these Guidelines and the implementation of international regulatory factors. We, therefore, welcome the new agenda item of next year's Legal Subcommittee entitled "General Exchange of Information on National Mechanisms Relating to Space Debris Mitigation Measures". Thereby, the Committee will be informed about different ways and means of implementing the United Nations COPUOS Space Debris Mitigation Guidelines, as well as other possibly even further reaching space debris mitigation regulations, international law and inter-contractual and/or administrative factors which can be used as a model for other States which have not yet undertaken steps in this direction.

Mr. Chairman, as an important continuation of its work, the Legal Subcommittee will carry out its multi-year Work Plan for the time period 2008-2011 on general exchange of information on national legislation relevant to the peaceful exploration and use of outer space in the framework of a Working Group under the chairmanship of Irmgard Marboe of Austria.

The German delegation stands ready to contribute to this discussion on a scholarly basis and considerable research on this subject has already been carried out by the Institute of Air and Space Law at Cologne University within the so-called Project 2001 and Project 2001+. In this framework, the national space legislations were examined and so-called building blocks were elaborated which can be used as a practical basis for the elaboration of new national space legislation. The commutation of this work can be downloaded, free of charge, from the Internet, details to be provided by the German delegation upon request.

Let me conclude, my delegation fully endorses the report of the forty-seventh session of the Legal Subcommittee and we are looking forward to the next session in spring of next year. Thank you.

The CHAIRMAN (*interpretation from Spanish*): I thank Mr. Von Marschall of the German delegation for his statement.

The list of speakers has thus been exhausted. This was agenda 9, of course.

Do any further delegations wish to take the floor on this agenda item?

It does not seem to be the case.

We will thus suspend our consideration of agenda item 9, Report of the Legal Subcommittee, and we will move on and I cherish the hope that we will be able to conclude our consideration of agenda item 10, Spin-Off Benefits of Space Technology: Review of Current Status.

Spin-off benefits of space technology: review of current status (agenda item 10)

I have no speakers on my list. I, therefore, consider that we have concluded our consideration of agenda item 10, Spin-Off Benefits of Space Technology: Review of Current Status.

Space and society (agenda item 11)

We will now move swiftly on the agenda item 11, Space and Society.

The only speaker I have on my list of speakers is Mr. Jegede of Nigeria and you do have the floor Sir.

Mr. O. O. JEGEDE (Nigeria): Mr. Chairman, thank you for giving the opportunity to the delegation of the Federal Republic of Nigeria to contribute to the COPUOS meeting agenda item 11 on space and society under the special theme Space and Education.

Nigeria, on the threshold of the twenty-first century, still has many environmental challenges such as deforestation, water resources management, rural and advance planning, ecological problems, transportation and communication to resolve. Tackling these problems by the use of space-based platforms is _____(?) as recognized in the National Space Policy approved in 2001.

Also vital is the human capacity development and to bring to the public awareness of the benefits of satellite technology.

Mr. Chairman, permit me to briefly highlight what are the achievements incorporated by Nigeria for regional capacity-building in the area of space science and technology applications.

Nigeria fully supports the United Nations-affiliated African Regional Centre for Space Science and Technology Education for English-speaking by a provision of an infrastructure, teaching resources and _____(?) facilities(?) to run the nine-month post-graduate diplomat courses in remote sensing, geographic information systems and satellite communications.

Today, some 120 nationals from 15 of the member States have benefited from these courses.

In 2007, the world celebrated the fiftieth anniversary of the Space Age with the theme "Space Technology for the Betterment of Humanity". Accordingly, the Nigerian National Committee, under the National Space Research and Development Agency, NASDA, concluded a month-long programme of activities, 11 September to 10 October, to educate the public on the benefits of space technology by the holding of press briefings, seminars, public city campaigns, science _____(?) competitions among school age children and exhibitions. These events, coordinated by the celebration of World Space Week in 2007. At the recognition of Nigeria's rising profile of entrepreneurship in space, the high school students at _____(?), were selected to be among nine groups of different nationalities for the second year running that participated in the anniversary weightless flight on 6 October 2007 in Las Vegas, United States of America, at a Youth Inspiration Project by Space Week International Association.

_____ (?) 9 is marked every year to highlight the importance of space exploration and to talk to undergraduate students on career prospects in the building of Nigeria's space programme.

In 2006, NASDA has organized on an annual basis a Schools Workshop on Space Education. Topics covered include solar system, space exploration, spin-offs and a workshop(?) for rocketry competition. The theme chosen for the 2008 edition of the Workshop was "Ready for the Sky" and over 1,300 students from across the country participated at the Kilbe(?) Workshop.

Mr. Chairman, it is highly gratifying to note that the private sector organizations and multinational companies are now supporting our public awareness and schools outreach programmes.

Nigeria is partnering with UNESCO to promote space science education curricula at the junior schools level. Educational materials such as charts, posters, videos and software on space sciences produced by NASDA, are given out free to space clubs in the schools.

In pursuance of the "Catch Them Young" initiative, Nigeria's Space Agency has commenced with the construction of a Space Sciences _____(?) to encourage interest of young Nigerians in space science and technology and in the near future, it has plans to construct a state-of-the-art planetarium.

Distinguished delegates, I thank you all very much for your kind attention. Thank you Mr. Chairman.

The CHAIRMAN (*interpretation from Spanish*): I thank Mr. Jegede of Nigeria for his statement.

I now give the floor to Mr. Peter Martinez of South Africa. You have the floor Sir.

Mr. P. MARTINEZ (South Africa): Thank you Chairperson for giving the South African delegation an opportunity to present our activities in the area of space and society.

Chairperson, our delegation attaches great importance to the promotion of public awareness of the societal benefits of space science and technology. South Africa participated in the global World Space Week celebrations which marked the fiftieth anniversary of the Space Age. Numerous space awareness events were implemented nationally throughout the month of October. These events were financially supported by the National Departments of Science and Technology, Communications, and Trade and Industry, and were implemented by a variety of planetaria, science centres and science awareness organizations throughout the country.

Chairperson, we are pleased to note that the United Nations General Assembly in its resolution 8/62/200 of 19 December 2007, declared 2009 the International Year of Astronomy. This global celebration of astronomy will also serve to highlight the value of space science and technology in broadening our intellectual horizons and enriching our daily lives.

South Africa plans to participate fully in the International Year of Astronomy. A national IYA Steering Committee was established in June 2007 to coordinate preparations for the IYA. We welcome cooperation with all other interested countries in this forthcoming celebration of the International Year of Astronomy.

Chairperson, South Africa has a number of societal projects that have been space-enabled to link societies and communities of various backgrounds. These projects are enabled by VSAT, Very Small Aperture Terminals. Among these, tele-education projects are, for example, cotton(?) online, which is a project of helping provincial education departments in which over 1,000 students have been connected to the Internet and have been allocated e-mail addresses to allow them to connect with other students and with their teachers.

Another project is Mind Step, which is a public/private partnership which involves tele-education and tele-health projects aimed at enhancing the quality of life for high school students and teachers. Subjects covered include mathematics, science, English, lifestyle and HIV-AIDS education. The project also provides health education programmes to help practitioners in public hospitals and clinics. Some of the content is directed at patients in those facilities such that they can be _____ized(?) and be able to better manage their health conditions when they are out of hospital.

In the area of tele-health, the Chris Harneybaraguana Hospital HIV-AIDS Research Unit is the largest HIV-AIDS research unit on the African continent and conducts research collaboratively with other global institutions.

The research unit uses VSAT to transmit and receive large data files cost-effectively and in a timely fashion.

VSAT is also used for tele-radiology of our hospitals in the remote Eastern Cape Province that do not have radiologists on site. X-ray images are transmitted via VSAT from the Eastern Cape hospitals to a hospital in Johannesburg where they are read and interpreted and reports are sent back to the Eastern Cape. Patients can now receive immediately medical treatment instead of waiting two to three weeks for results before medical intervention can be introduced.

In the area of e-Government, the Department of Home Affairs has used VSAT to connect over 100 vehicles to serve as mobile offices connected to the

main office in the nation's capital. People in remote areas of the country can now apply for birth certificates, passports and other documents without the expense of travelling to urban areas where the Home Affairs offices are located.

In the area of communications, satellite communications is used to provide radio and television services to the remote areas where it is expensive to deploy terrestrial infrastructures. The broadcast content of these services is being broadened to include educational programmes for children and adults and these are partially funded by Government Departments.

Finally, Chairperson, a number of national research facilities and civil society organizations offer ongoing space awareness activities throughout the year that are too numerous to mention individually but which collectively have considerable national impact. Thank you.

The CHAIRMAN (*interpretation from Spanish*): Thank you Mr. Peter Martinez of South Africa for the statement.

And I now give the floor to the observer from UNESCO, Yolanda Berenguer.

Ms. Y. BERENGUER (United Nations Educational, Scientific and Cultural Organization): Thank you Mr. Chairman. As this is the first time that UNESCO is taking the floor, I would like to take this opportunity to congratulate you as well as the First Vice-Chairman and the Second Vice-Chairman, for your election as the leading officers of the COPUOS meeting.

We would like to also extend our condolences and regret to the following countries, Myanmar, China and Japan, for the natural disasters that have occurred in their respective countries and I think this is another opportunity to foster international cooperation and enhance a science and technology to reduce the effects of natural disasters.

Mr. Chairman, as you are well aware, the Space Education Programme of UNESCO was launched in 2002, based on two world conferences held at the end of the twentieth century. The first was the World Conference on Science, which called for the improvement of science education at all levels, improving the curricula and teaching methodologies. The second world conference was UNISPACE III, which promoted and called for the enhancement of space science and technology to the younger

generation and raise public awareness of the benefits of science and technology.

Putting together these recommendations we have come up with the Space Education Programme which focuses at all educational levels but at the moment we are focusing on secondary level, which, as we all know, is the crossroad (crossroad?) for the future of the young generation.

Since then, UNESCO has organized Space Education Workshops in the following countries: the Philippines in 2004; we organized a workshop in Viet Nam, Colombia, Nigeria, and most recently in Ecuador. The Workshop in Ecuador was organized in 2007 in the framework of the Space Conference of the Americas. As a follow-up of this Workshop, we organized a Regional Workshop this year, again spearheaded by the Pro Tempore Secretariat of the Fifth Space Conference of the Americas, but this time at a sub-regional level, with the participation of several countries, namely Argentina, Brazil, Chile, and Peru. Of course, Ecuadorian students and high school teachers also participated in this Workshop. And most important, there were representatives of space agencies such as CONAE, CONIDA, and the Brazilian Space Agency, AEB. Our experts came from JAXA, from INPE, from the French Space Agency, and from a Planetarium in Colombia called Maloca(?).

Mr. Chairman, I think that this is indeed a very wonderful opportunity and we would like to continue, UNESCO will fully support this type of activity at the regional basis and in this Workshop we organized a one-day Workshop with the teachers, after which recommendations were formulated. The following recommendations were made. Number one, that there would be an establishment of a National Commission on Space Education at the national level in the different countries in Latin America. Secondly, would be the establishment of a Regional National Commission on Space Education made up of representatives of the National Commission of the different countries. This recommendation is a way forward that was agreed upon, both by the representatives of the space agencies and its teachers, and it is hoped that it will be spearheaded by the Ministry of Education in the different counties, with a view to moving forward in innovating the science curricula.

Moving into the Asia-Pacific region, UNESCO participates regularly at the Asia-Pacific Space Agency Regional Forum, which is spearheaded by JAXA. Last year, UNESCO participated in APRSAF-14, held in Bangalore, and this year

UNESCO will be participating and organization a Teachers Workshop, in cooperation with Hanoi, with the Vietnamese Academy of Sciences and the Space Institute of Technology, which is the host of this event.

We will also be supporting some educational and outreach activities, such as organizing a contest, or a drawing contest for primary students on the theme "Astronomy".

UNESCO organized a Workshop, a Space Education Workshop in Tanzania this year as well in the framework of the International Year of the Planet Earth celebration, and the first Workshop was held in Dar-es-Salaam and we moved to Aruja(?) where the IYPE regional launch was held. And our experts again for this Workshop were JAXA, the French Space Agency, Amman(?) Planetarium, and a representative of the United Nations Regional Office based in Nigeria. Now, our action here is to promote South-South cooperation. In this regard, we are fully intend to have experts from other developing countries, trying to promote and share their knowledge and experience with other partners in this respect.

Mr. Chairman, as you are aware, and I guess that this has already been exposed by many member States, UNESCO is the lead agency for the International Year of Astronomy, which was approved by the United Nations General Assembly last year. In cooperation with IAU and we have already solicited the cooperation of the United Nations Office for Outer Space Affairs, UNESCO is looking at organizing some outreach educational and capacity-building activities in the framework of this year.

Just for your information, the launch ceremony of IYA will take place on 15-16 January 2009 in UNESCO Headquarters and there will be prize winners, who will be invited as well as distinguished astronomes(?) and astronomers and related scientists in this launch ceremony.

UNESCO intends to publish educational materials in six languages on astronomy, as well as distribute low-cost telescopes in cooperation with IAU and also support IYA special projects that will be identified in the very near future.

Taking this into consideration, UNESCO would like to propose for next year's agenda item 11 that under Space and Society agenda item Space and Education, that COPUOS member States provide information on their activities related to astronomy with a view to enhancing cooperation as well as more outreach activities in this respect.

UNESCO will also be supporting a Spanish initiative called "Starmus(?)", which is demonstrating the link between culture and space. This is in conjunction with the inauguration of the Gran Canaria Telescope in Spain and there will be an open concert that will be led by, Mr. Chairman, if you know the group called Queen, this person is the very known composer of Queen and we also have the UNESCO Goodwill Ambassador called Jean-Michel Jarre, who will be leading this concert. This will be held in July 2009 and maybe what we could do is try to organize a date so if some member States would be interested in going to Spain after the COPUOS meeting, then we could look into this.

Thank you Mr. Chairman for your attention in this matter.

The CHAIRMAN (*interpretation from Spanish*): Thank you very much. And before I give the floor to the Ambassador from Chile, let me thank you for presentation. I am sure there are a lot of fans of Queen and Jean-Michel Jarre here but a lot of them would be very interested in the inauguration of the telescope in Gran Canaria, a marvellous event and perhaps the Spanish delegation could talk to us a little bit more about this, this upcoming event or elsewhere. But, again, thank you very much and the way in which UNESCO is becoming very active in the region and in Latin America, Asia-Pacific, and in the African regional as well, our commendations.

I give the floor to the distinguished Ambassador of Chile.

Mr. R. GONZÁLEZ ANINAT (Chile) (*interpretation from Spanish*): Thank you Chair. Just to avoid any misunderstandings, I am a fan of the Beatles and Sinatra rather. I do not really like Queen or the Kinks, musically speaking.

Let me make a few remarks following Yolanda Berenguer to whom I talked to yesterday. Let me point out the enthusiasm and continuous spirit of cooperation that she has always shown to the Committee on such crucial topics as education and space.

Chairman, you may remember that this is one of the topics of the previous Space Conference of the Americas that, to be truthful, this huge effort that Yolanda has made is still not enough. We had an expert from FIDAE to help prepare the Space Conference of the Americas and we did not have a participation from the UNESCO and I think Yolanda

was not able to participate at that time. But the topic of education is not a second-rate topic for our countries, thanks to education. In fact, they were unable(?) to acquire or overcome many of the great insecurities in the world, one of them being food insecurity and linked to climate change. I have a whole list of concerns and threats or even the development of societies which, by another institute, which is not necessarily linked to UNESCO, which is also doing a great job.

We were talking about astronomy and I think we need to approach this not just through the link that we have talked about here but there is links that our work here has with astronomy.

This is a very important topic concerning National Commissions and in our case it is under our Educational Ministry. Let me tell the representative of UNESCO that it concerns Chile, she will be able to count on the total availability to cooperate. The current Minister of Education has a long career in the universities of Chile. She was Rector of the University at one point. This is someone who knows when we talk about dissemination of education and is fully conversant with this and very important for Chile, such a lengthy country to ensure this.

We would hope that we would be able to have official communication from UNESCO in Chile unless and this probably would also apply to other countries as well. I am not going into any further detail what she said.

But just lastly, words from a friend. Let me say to the Massalbos(?) Deputy Director of UNESCO, who is trying to establish, well we have been trying to establish telephone communications since 2005, well perhaps by 2010 we could have a revision+5 to see whether we can get in touch by phone. Thank you.

The CHAIRMAN (*interpretation from Spanish*): You are making me think of the UNISPACE III+5 or +10. I am sure that Yolanda is going to take very attentive note of your request and transmit it to her Deputy.

Now it is my pleasure to give the floor to the distinguished representative of Spain.

Mr. J. L. MUÑOZ-DE LABORDE-BARDÍN (Spain) (*interpretation from Spanish*): Thank you very much Chair.

First of all, let me congratulate you on your accession to the Chair of the Committee. I say this since this is the first time I take the floor.

Now, let me mention the mention you made about the telescope in Canarias. We will be very pleased to make a presentation at this time, but as you know, I think we do not really have anything prepared in this respect. What we are going to do is this. We will get in touch with the organizers. At an upcoming meeting of the Scientific and Technical Subcommittee, we will give a presentation for the members of the Subcommittee. Thank you.

The CHAIRMAN (*interpretation from Spanish*): I thank the delegate from Spain and thank you for taking an immediate interest in our request. We are very interested in this and I am sure that we will be able to count on your coming back to this at a future date.

Now, Space and Water, my first speaker is Argentina, Féliz Menicocci.

Mr. F. MENICOCCHI (Argentina) (*interpretation from Spanish*): Thank you very much Chair. Chair, the Argentine National Space Plan carried out by CONAE, has as one of its objectives providing data from space for the benefit of socio-economics activities of the current and one of the most developed aspects of our National Space Plan is the information cycle linked to climate hydrology and oceanography. And this covers the quantification and follow-up to critical primers linked to the water supply and soil moisture in agricultural applications. CONAE, and particular following the start-up of the Institute, the Mario Gulich Institute for Studies, have been working with the National Water Institute of our country, INA, so that space data be used to better manage the water cycle in Argentina and count on the importance of the management of this resource and within the framework of our policy to implement regional projects.

Last November, in the city of Mendoza, we, along with the Office for Outer Space Affairs, ESA, and support from the Swiss Government, held a Seminar on Sustainable Development in Mountains, in particular in the Andean Range. Over 60 experts from different parts of the world participate, and in particular many from our region, along with representatives of governments, universities and the private sector all involved in the programmes where space technology was applied in order to come up with regional projects. One of the main concerns that those present had was to reduce the uncertainties linked to climate change and water resources in the Andean region.

Now, in the light of the very intense cooperation we have maintained in Argentina in satellite applications, Argentina and Chile decided to read(?) on a project to develop the following: identification and evaluation of the snow glaciers and high plateau covers, in particular concerning valley irrigation in the Andean region, mainly the fourth region of Chile and the Province of San Juan, Argentina.

Different organizations and institutions decided that this study of the watershed and its use in the agriculture of the region should be used in other zones of the Andean region for the benefit of all.

Last April in Riyadh, we attended the International Conference on Use of Space Technology for Water Management, organized by the Office for Outer Space Affairs, UNESCO and the Kingdom of Saudi Arabia. That Congress was successful. It brought together experts from around the world and highlighted the interest and dedication that Saudi Arabia has shown to this topic.

The local organizers of this event, the King Abdul Aziz City for Science and Technology, and the Prince Sultan Bin Abdulaziz International Prize for Water showed the excellent level of knowledge on this topic and allowed us to have a very fruitful exchange of opinions on different aspects of water management. Many different projects were produced by this encounter and my country would like to participate in many of these, among them the one on desertification which is also a huge problem for Latin America, as well as the Arab countries.

Chairman, the overview we have had of the activities carried out by the non-governmental organization, Prince Sultan Bin Abdulaziz International Prize for Water allowed us to support and enthusiastically recommend that this institution participate as an observer to the meetings of COPUOS. Thank you very much.

The CHAIRMAN (*interpretation from Spanish*): Let me thank Félix Menicocci for that statement on behalf of the Argentine delegation.

We now come to the technical presentations. The first will be presented by Mr. Dmitry Gonchar of the Russian Federation, who will make a presentation entitled "Presentation of the Draft Treaty on the Prevention of the Placement of Weapons in Outer Space, the Threat or Use of Force Against Outer Space Objects".

You have the floor Mr. Gonchar.

Mr. D. GONCHAR (Russian Federation): Thank you very much Mr. Chairman. Good morning ladies and gentlemen. First of all, I would like to introduce myself. My name is Dimtry Gonchar and for the past year and a half I have been stationed at the Russian Permanent Mission in Geneva. However, COPUOS has been my home away from home for more than 10 years previously. It is really good to be back and see so many familiar faces around the room.

I would like to speak to you today about a very important document which directly affects the work of this Committee, whose mandate is to promote and lay out the legal and political basis of the exploration and use of outer space for peaceful purposes.

Speaking in Munich on 11 February last year, the Russian President, Vladimir Putin, warned against the emergency of new high-tech destabilizing types of weapons in new areas of confrontation, particularly in outer space. He emphasized that weaponization of outer space could trigger unpredictable consequences for the international community, no less serious than the onset of the nuclear era.

The President also stated that a draft Special Treaty was being prepared aimed at preventing such a development.

At the _____(?) Meeting on 12 February 2008, Mr. Sergei Ordov(?), the Minister of Foreign Affairs of the Russian Federation, addressed the Conference on Disarmament and officially introduced a draft of the Treaty on the Prevention of the Placement of Weapons in Outer Space and of the Threat or Use of Force Against Outer Space Objects. I will refer to it as the PPW Treaty to save some time.

It was prepared jointly by Russia and China for consideration by the Conference, and you can pick up a copy of the draft Treaty in the back of the room in English or Russian. And it is also available at the Conference on Disarmament Website in all United Nations languages.

The PPWT is not something totally new. In fact, the first proposals for a binding treaty to plan the placement of weapons into outer space dates back to 1983. A draft document to this regard was tabled in this very Committee by the delegation of the then USSR.

The PPWT draft is based on the working document CD1679 on Possible Elements of the Treaty, tabled jointly by the delegations of Russia and China, together with a group of co-sponsors in June 2002. The draft Treaty is a result of subsequent discussions in various formats reflected in a series of working papers and three versions of compilations of the views expressed at those discussions. All these documents are available at the CD website.

A few words on the rationale behind the PPWT. Modern international space law does not prohibit the deployment in outer space of weapons which are not weapons of mass destruction. However, such weapons, if deployed in space, would have a global reach, high readiness and capability for engagement, not only against outer space objects, but also against critical infrastructure on Earth. Such weapons would be ready for first use, thus generating suspicion and tensions among States and would inevitably degrade the climate of mutual trust and cooperation in space exploration, rather than serve as a means of prevention and containment. This, in fact, will equate to a military capability to WMD.

Besides, the deployment of weapons in outer space by one State will inevitably result in a chain reaction and this in turn is tantamount to a spiral in the arms race, both in space and here on Earth. The objective of the draft PPWT is to prohibit the placement of weapons of any kind in outer space and the use or threat of use of force against space objects. The Treaty envisages to eliminate existing lacunae in international space law, create conditions for further peaceful exploration and use of outer space, preserve costly outer space assets, such as commercial satellites, and strengthen international security and arms control regimes.

So, more precisely, why do we need the PPWT? First, because without such a treaty, it would be difficult to predict the development of the strategic situation in outer space and on Earth due to the global operating range of space weapons. It would be impossible to claim that space weapons are not targeted at a given nation. Moreover, space weapons could enable States that have developed them to discreetly tamper with other space objects and disable them.

Second, because the international situation would be seriously destabilized due to the possibility of unexpected, sudden use of space weapons. This alone could provoke pre-emptive acts against space weapons and consequently even the possibility of armed conflict in outer space.

Third, because space weapons, unlike weapons of mass destruction, may be applied selectively and discriminately so they could become first strike and re-use weapons.

Fourth, because the placement of weapons in outer space would arouse suspicions and tensions in international relations and destroy the current climate of mutual confidence and cooperation in the exploration of outer space.

Fifth, because obtaining monopoly of space weapons would be an illusionary goal. All kinds of symmetrical and asymmetrical responses would inevitably follow from all major stakeholders in outer space activities, which, in substance, would constitute an arms race, something which is exactly what we should be trying to avoid.

A few words on the relation of the PPWT to transparency and confidence-building measures. We think that in outer space activities, TCBMs are very important for strengthening mutual trust, for enhancing safety in space manoeuvring for countering motivation for weaponization of outer space, for building the necessary climate for negotiating a new treaty on PPW.

Through the relevant United Nations General Assembly resolution, Russia has initiated a new round of discussions on updating the recommendations on transparency and confidence-building measures in outer space activities in the United Nations.

PCBMs may also become a part of the new Treaty but we think that they cannot be a substitution for a legally binding document.

Some of you may be familiar with acronym PAROS, which stands for Prevention of an Arms Race in Outer Space. Some may think that this draft Treaty is all about PAROS. There is, however, a subtle difference. We are not proposing a PAROS Treaty but we intend to solve the core problem of PAROS in our draft. The prohibition of the placement of weapons in outer space and the universal observance of this ban will mean that no arms race in outer space is possible. There can be no room for an arms race where the deployment of weapons is such is forbidden. In other words, by addressing the issue of non-weaponization of outer space, we are at the same time averting the danger of a possible arms race. However, this prohibition alone is not enough. The functioning of all these space objects can be disrupted without using space-based weapons but the weapons based elsewhere, or by other actions not related to the use of weapons.

In order to protect outer space objects from such a threat and to prevent any other force-laid actions in outer space, we propose to supplement the non-weaponization obligation by another one, that of the none use of force or threat of use of force against outer space objects.

We are proposing a treaty which is, at least we think it should be, realistic and practical. No weapons are placed in outer space now. We want to keep this status quo. Nothing of what the States now possess in outer space will be affected in any way by this draft Treaty. On the contrary, the main purpose of the draft Treaty is to assure the safety and security of outer space assets. This fully applies to the satellites which now provide information services in the interests of national security of various States.

The Treaty provides for some basic definitions which, in our view, could be useful for the clarification of the specific scope of the Treaty. These definitions include outer space, weapons in outer space, outer space objects, placement of weapons in outer space, and some others.

For all of you who have spent many years trying for a definition of outer space in the Legal Subcommittee, this may sound a little too optimistic, but we believe that these definitions are supposed to answer some very important practical questions. For example, ballistic missiles travelling through outer space will not qualify for being placed in outer space and thus will not be affected by the Treaty. On the other hand, those missiles will not qualify as outer space objects and will be exempt from the rule of no use of force against outer space objects. This means that ballistic missile defence will not be subject to the Treaty except for the prohibition of placement of their strike components in outer space because they in turn would qualify as weapons in outer space.

We understand that the proposed definitions may raise a lot of questions. Our objective was to give a general idea of what we mean using best practices and existing attempts in definitions, notably those tabled at various times in the Legal Subcommittee.

We are very open to consult and negotiate the final formulations of the PPWT with all our partners.

The non-use of force obligation is the application of the core United Nations Charter Principle to Outer Space Activities. It covers a wide range of possible hostile actions against outer space objects, such as destruction, damage, impairment of

normal functioning, disruption of channels of communication with ground command and control centres, deliver adulteration of their orbit parameters and so on.

This obligation, while not directly prohibiting the development of non-space-based anti-satellite weapons, bans their testing of the _____(?) outer space objects and their use against such objects. This obligation seems to us to be more verifiable than a total ban on the development of such systems.

A special verification protocol can supplement the Treaty at a later stage or the PPWT verification mechanism may be substituted by a set of agreed confidence-building measures.

This does not at all mean that the compliance with the Treaty provisions is unverifiable or that they think the verification is not needed. A special study of this issue by our Canadian colleagues, in document CD1785 have proved that verification of non-placement of weapons in outer space is technically possible and feasible.

The Conference on Disarmament has been discussing and developing basic elements of the Treaty for five years now. The results of the discussions have been reflected in three compilations and in a set of CD working documents submitted by Canada, Russia and China.

We have not heard to date any substantive or convincing arguments against the PPWT. The overwhelming majority of our partners reacted positively to the PPWT draft. Many States are looking forward to substantive work on this issue at the Conference on Disarmament.

We think that we should now focus on substantive discussions on the PPWT within Item 3 of the Conference Agenda without linking it to any other issues.

We also believe that such a discussion will allow us to develop necessary interaction with the United Nations COPUOS.

We have submitted the draft PPWT with a research mandate. It has been supported by the majority of member States of the Conference and does not add any complications to achieving a compromise on the current draft programme of the Conference. We hope that subsequently, when appropriate conditions are met, our work can be channelled into a negotiating

format through the establishment of a relevant ad hoc committee.

We believe that we can subsequently conduct discussions on PPWT issues if we follow the structure of the proposed Treaty elements. Hence the subject of further work could be divided in the following topics which you can see now on the screen.

In the course of the recent Conference on Disarmament debates on the issues of outer space, we have already reached a common understanding that all States are interested in keeping outer space from turning into an arena for military confrontation in assuring security in outer space and uninterrupted functioning of space assets. It is important that we all share this interest. The issue is now how to meet these goals and practices.

A number of countries have already submitted some specific proposals in connection with the draft Treaty. We plan to discuss them thoroughly and take onboard as many suggestions as possible. We would like to stress again that we are very open and flexible on any thoughts and suggestions that the international community could present to us in considering this draft.

We are driven by the belief that the PPWT will serve the security interests of all States and will contradict the interests of none.

In this regard, may I venture a thought on possible cooperation between the Conference on Disarmament and COPUOS in that ensuring that outer space stays peaceful. The presentations of the now former COPUOS Chairman, Mr. Gérard Brachet, to the CD on the issues now before the Committee were very useful. To our mind, possible joint a CD-COPUOS Workshop on the most dire threats to the security of outer space operations and ways to counter them, such as, for example, the proposed Code of Conduct, transparency and confidence-building measures, and their relationship to our initiative, would be a very good way to exchange ways and plot a road to a safe and sustainable use of this most valuable asset of mankind.

May I also inform that on 12 and 13 August, we will be hosting an informal discussion on the draft PPWT in Geneva. We invite both delegates and COPUOS and the Office for Outer Space Affairs officials to join us in this debate.

Thank you for your attention and I stand ready to answer any questions you might have, both formally

in this room and informally outside the room, I will be here until Friday so any questions are welcome. Thank you very much.

The CHAIRMAN (*interpretation from Spanish*): On behalf of all of the delegates, let me thank Mr. Dmitry Gonchar of the Russian Federation and who is kindly acting as one of the representatives of the Russian Federation in Geneva. Let me thank him for his presentation of the draft Treaty on the Prevention and Placement of Weapons in Outer Space and for his going into the different aspects of this in his presentation, that is the motives behind it, this draft Treaty, as well as the links with the ICBMs and the TCBMs and the PAROS, elements having the definition of scope, the PPWT, the TCBMs and PAROS, as well as the links to the disarmament talks that are ongoing. He proposes several inclusions, for a joint seminar, for example, that could be held with perhaps between the Committee and the Disarmament Conference. We thank him for his remarks and open the floor for discussion to delegations.

OK, I see no reactions but I reiterate his proposal that we have informal consultations between now and Friday on this.

The next presentation is from Mr. Bhaskaranarayana from India entitled "Space for Societal Applications: The Indian Context". You have the floor Sir.

Mr. A. BHASKARANARAYANA (India): Thank you Mr. Chairman. Mr. Chairman and distinguished delegates, the main emphasis of the Indian Space Programme is its application for the benefit of man and society, especially at the grassroots level. Over the four decades, India has acquired the capability to design and deploy communication satellites, remote sensing satellites and the launch vehicle systems for these applications.

Equally, emphasis has been given for the application of space technology for the benefit of societal application. As _____(?) today, we had 26(?) launch vehicle missions, 50 spacecraft missions, and 16 spacecraft missions for other countries.

Currently we have at our disposal, 11 communications and meteorological satellites and nine remote sensing satellites. This capacity has been used for various societal applications. The radio-societal application who is in the space system are tele-education, tele-health, tele-medicine, Village Resource Centres, disaster warning and dissemination, satellite-based aided search and rescue systems.

If you look at the education scenario in India and the challenges that are there in front of us, India has a population of more than one billion people and most of these people are in the education age but all of them are not equally sought by quality education. There is a vision in India to a universal quality secondary education by 2015. As we are shifting from the agricultural background to the knowledge society, the predicted involvement of 45 million students at the school, college and higher education levels presents a challenge. There is a huge shortage of teachers, properly qualified and good quality teachers is a major issue and we have about 26 official languages which are used in different States and the primary and secondary education is done in their mother tongue.

There is a rapidly changing syllabus to _____(?) within the sphere of requirements and also the poor quality of teachers in higher learning subjects like nano-technology, VSI(?) and _____(?) poses a challenge to us. And also there is a problem of migration of quality teachers to move to attractive and highly paid jobs.

A significant increase in the involvement is another issue which we have to tackle. All these issues are to be tackled by the use of technology and satellite technology is one which, at least, gives some solutions to the problems of education in our country.

At one time, technical(?) technology, development of VSATs and significant cost reduction in _____(?) factor, makes it affordable to use space technology for education. Using VSAT technology with the capability to have audio-visual interaction, the system can efficiently use by taking quality education to every nook and corner of the country. Before coming, we held, used satellite technology before for further identification(?) like satellite inspections, delivering experiments, TDCT and GROUND SAT for furthering education with the satellite media.

India has launched an exclusive satellite for education called EDUSAT in 2004 which is used for basically education in all fields. There are two types of networks we have deployed, that is one is a broadcast network for primary education which uses a low-cost giga(?) _____(?) technology and a colour TV, and today we have more than 33,000 terminals operating in various regions. But higher and professional education, the _____(?) already interact to two systems has been designed and deployed and there is more 3,000 terminals are operating today, covering about 50 networks.

We have gone through the evaluation as the first phase of our project by an independent institute and it is common that there was a remarkable improvement in the quality of education, there we have deployed by this network. There is a 49 per cent gain in the performance on the achievement test, phases 3 and 4, and the attendance almost increased to 80 per cent during the broadcast time.

We also have got feedback from teachers which says there is a long retention of information among students for them to help in learning difficulty concepts, students paid more attention to the subjects and enhanced students ability to visualize and sustain the interest and attention.

This has also had feedback on some of the improvements which we had to do in the type of broadcasts we are doing and this in itself, 60 per cent found that it is difficult to doing a three and four broadcast activity, 95 per cent said that EDUSAT helped in joyful learning, 90 per cent felt that it helped with increasing their attention span, 48 per cent said it was more efficient than audio programmes, and 68 per cent found it difficult to complete the syllabus in time.

Using this feedback, we have modified our system and it is being continuously improved to define(?) the higher quality of education.

And you can see some of these networks we have put for primary education. In this you can see, always there is a teacher present to assist the students in helping and to interpret the broadcasts.

For the _____(?) programmes, must implement it in three phases, the pilot phase where we have got the inputs from all the stakeholders. This is followed by the operation phase, there we are using this network to spread the education, the quality education, especially the training of the teachers in various updating their knowledge to meet the challenges of the present _____(?).

Similarly, like the tele-education, another socially relevant programme has been tele-medicine. We have in India a great divide in medical facilities available between the urban and the rural areas. What about people? Seventy per cent of our population stays in the rural areas where 75 per cent of it, medical centres there, are available only in the urban areas.

This digital divide, of the health divide, has to be bridged. So tele-medicine has been used to do this particular operation. Providing the technology

connectivity between the remote and rural hospital and super speciality hospital for tele-consultations, treatment and training of doctors and _____(?), continue medical explorations between medical colleges, postgraduate institutions and the various hospitals, and mobile tele-medicine units, but rural health care, especially in the areas of optomology and community health, are the first areas of tele-medicine in India.

Tele-medicine has been started in a low key in 2001 and as today, 300,000 patients are being benefited by tele-medicine and today we have 300 hospitals networked out of which 250 remote hospitals and 50 are super speciality hospitals. All States, including _____(?) and Kashmir and _____(?) Islands, are connected through a tele-medicine network.

In the phase I of the _____(?) network, we have evaluated the tele-medicine network. A total of 945 outpatients consultations were done. So out of this only 187 required some referral to the hospital and a total thrombosis were 37 and the cost-saving is expected to be more than 81,000 and the patients health, only 19 per cent of them are _____(?) otherwise to hold these same consultations.

The user, the feedback here shows they get the best doctors advice, 18 per cent said they have saved money and time and the reduced expenditure. They use this expenditure on _____(?) family from _____(?) like that, and 18 per cent said the best doctors advice is available for a very low cost.

This is a tele-medicine _____ (not clear) being established by the satellite-based connectivity.

This is a mobile van being used for tele-medicine purposes. You can see it has all the necessary equipment and the satellite connectivity to connect to the super speciality hospitals.

We have here about 300 tele-medicine facilities which had started in 2001 and gradually increased and we will expect to grow to 500 at the end of this year.

_____ (?) is a new concept which are used, to be used in space-based services but community out _____ (?). It started in 2004. Using our own satellite systems, the availability of data from the remote sensing satellites and the connectivity powered by our communications satellites is used for

services to the villages, that it would be watershed development, franchise (?) _____ (?) planning, drinking water, relevant information, tele-education, especially advance education, any way it can training and information. We have created 400 VRCs and each VRC supports a _____ (?) 10 to 15 villages..

This _____ (?) cyclone and we have a system of warning of this cyclone in affected places, 24 hours in advance, so that the people can go to the various cyclones centres. We have about 315 cyclone warning dissemination installations today in India.

We also have a strong support for the satellite-aided search and rescue operations and we also support the COSPAS-SARSAT system and also have a database (?) SARSAT payload to support, for use for various search and rescue operations.

A roadmap for utilization the space services, the total applications is to enlarge the tele-education network to cover all the States and also help to collect for this partnership. Similarly, in tele-education, we want to have many more mobile systems and also use it extensively for continuous medical education. And we are faced here, our aim is to _____ (?) access in the two to three years.

In conclusion, with this primary emphasis on large-scale applications of space technology, on an interim basis, towards national development, the Indian Space Programme has to distinguish itself as one of the most cost-effective and development -oriented space programmes in the world, continued efforts with ISRO, for the welfare of the common people, to the various development programmes at the aim of the space programme in India. Thank you for your attention.

The CHAIRMAN (*interpretation from Spanish*): Let me thank Mr. Bhaskaranarayana for that very interesting presentation. I am sure everybody would agree to say that every time we hear how a country like India has mastered special technology and used it, it is gratifying to see how they manage to meet such huge challenges. As you said, if only for the 20 languages that are spoken and the kind of demands this puts upon you, especially when we talk about remote medicine and contact with the remote areas, something I think is very worthwhile and an excellent example for many developing countries, including my own, with this kind of problem, is also present. So just to say that this is a very interesting and clarifying.

I see the Ambassador from Chile wants to take the floor as well.

Mr. G. GONZÁLEZ ANINANT (Chile) (*interpretation from Spanish*): Thank you Chair. I fully agree with you. Having to deal with 20 languages, it is very difficult. It is not the case of Colombia where you speak excellent Spanish, it is the case of my country where we speak Chilean which resembles a little bit Spanish. But let me highlight two points which are essential.

First of all, my admiration for what India has accomplished in this field, a country which historically has been showing us what can be done with space applications for developing countries and in clear contrast, we have some papers that have been circulating that have been trying to describe a kind of movie-type world where we are going to get involved in aspects that have nothing to do with our own true needs. It is clear in India has brought up crucial programmes for countries like ours, remote medicine, communications, and this is something that has been part of the resolutions of the United Nations General Assembly in the past and has been dealt with by this Committee. So it is not a coincidence. It is also the fruit of cooperation that has taken place in these fora.

Now, in the light of all this, through you Chairman, I would like to ask whether we can count on the participation of India during the upcoming Space Conference of the Americas. I think it would be of great assistance to us. Many times, we get the format for that Conference. We had a very important Conference in Colombia, another one in Ecuador, and we have always had delegations from India and the Peoples Republic of China as well. But in this case, on this specific topic, I would like to ask him, through you Chairman, that he participate to see how we can establish an interregional dialogue here through the Space Conference of the Americas.

The CHAIRMAN (*interpretation from Spanish*): Thank you distinguished Ambassador from Chile. I think that this interregional cooperation idea is a very valid one, part of South-South cooperation certainly. But let me give the floor to the Indian delegation to answer a specific question or request, that is that they put the benefit of their experience to the service of the Space Conference of the Americas and probably in other ways too, in interregional cooperation, perhaps within Africa as well. You have the floor Mr. Bhaskaranarayana.

Mr. A. BHASKARANARAYANA (India): Thank you Mr. Chairman. Certainly we will participate in this meeting and we would like to share our experiences and this comes from what we have

developed in this distinguished Conference. Thank you Mr. Chairman.

The CHAIRMAN (*interpretation from Spanish*): Thank you very much. That is very kind of you. And again our thanks for your presentation.

We now come to the third presentation this morning. This will be made by Mr. Tetsuya Nagatomi of Japan, speaking on "JAXA Industrial Collaboration Programme".

Sorry, the delegate from Colombia I think wanted to say something. Can we just hold the slide for one minute or two?

Mr. I. D. GÓMEZ-GUZMÁN (Colombia) (*interpretation from Spanish*): Colombia wishes to express its appreciation of the efforts deployed by a country like India in this field which I think highlights the importance of the optimal use of space applications, again not for just commercial purposes but for the purposes of the development of societies in countries like our own. Colombia is also developing its own telecommunications satellites so that it can develop its own satellite coverage programme and thanks to the efforts already deployed, we have been able to cover 15,000 schools in the country.

The CHAIRMAN (*interpretation from Spanish*): Thank you very much delegate from Colombia.

Now we return to Mr. Tetsuya Nagatomi from Japan who will make his presentation.

Mr. T. NAGATOMI (Japan): Thank you Mr. Chairman. I am honoured to present the Industrial Collaboration Programme in JAXA. JAXA promotes industrial cooperation towards the expansion of space technology utilization and the improvement of space business in Japan and the basic law was established last month. It provides the promotion of transfer of space technology to business and it demands for further more efforts.

JAXA's Programme has three categories. First, spin-offs to utilize JAXA's technology. Second collaboration to _____(?) commercial space business with JAXA. And third, space applications where JAXA certifies products for use in space.

The Programme is applied to each of the three categories, the intellectual property utilization, purple level, and Japan's space field.

First introduced, intellectual property utilization programme as keynote. The objective of the Programme is to utilize wider JAXA's intellectual property not only in the field of LSAT(?) but also widely in the field of _____(?) in the field.

JAXA promotes spin-off with partner coordinators. In fact, we can see examples of JAXA's spin-off efforts contributing to the environment, the Earth(?), security and safety.

Now I would like to introduce, for example, in JAXA's spin-off, Act 1, insulation material for building towards prompt rocket(?) industrial _____(?) insulation material. This technology was developed for the faring of the HII-A rocket and it can insulate the heat energy with the lightweight material. With this technology, the Nichi(?) Sanyo(?) Corporation developed an advanced ceramics with high-insulation efficiency and commercialized it by the name of Gyna(?). Gyna just with the industrial needs such as the building, vehicles, facilities and other items of it. This material, on this material works with only thickness of one or two millimetres, it never affected air conditioning which reduced the auto-aeration and prevent the global warming.

Gyna can be used on card surface as well as rock surface because it is painted-type insulation material and it also has a strong adhesive property that can endure the vibration of lands(?). Nichi(?) Sanyo(?) Corporation was ordered for Gyna by the Tokyo Chamber of Commerce and Industry last year.

Another contribution to implement, general review disposal facilities towards and transport from space recycling technology of organic waste. JAXA is contacting the researchers for recycling technology of organic waste, a part of cross-derived(?) support technology to realize long-term human space exploration. With this technology, Tyo-Corat(?) Corporation has developed this proto(?)-facility for organic waste such as livestock waste and organic waste, produced through manufacturing products in the food industry. This technology is fundamentally different from the current one which deports organic waste by diluting it to meet standard values.

You can see the picture, Tyo-Corat(?) intends to make it possible to reduce organic waste of aquatic and energy resources. This technology enables complete disposal of waste and will be a significant environmental solution.

Even proto(?)-types can treat organic waste of 100 kilograms per day.

Act 2, contributing to whole life. General waste purification system _____(?) from drinking water, the production technology for _____(?). Water is indispensable to life and its effected utilization is particularly important in the _____(?) and the _____(?) such as spacecraft and space colonies. JAXA has been researching and developing on recycling the waste water and hygienic water in the International Space Station into safe drinking water.

Water technology was transferred to the New Meditech(?) Corporation. The New Meditech(?) Corporation is saying the new general water purification system, named Crystalby(?). Crystalby(?) used a portal with the world's small portal with its _____(?) one millimetre. The pore(?) is smaller than the molecular of water but it is less only the merger(?) of water goes through by using special technology of the molecular arrangement of water which enabled to generate pure water. However, Purasat(?) has a bad taste and it is not good for health if continuously drinking it over a long time.

They add minerals to serve the programme and create it _____(?) water that it _____ (*not clear*) and set. Crystalby(?) has been used widely in Japan for preparations for disaster, regions with _____(?) to work on studies, medical projects(?) and general home use.

This bottom photo shows mixed water converts to mineral water.

Last, and the last _____(?) contributing to testing the design of _____(?) carriers for high field training, transported from the advanced information software when launching a rocket, the other security measures as much as possible. There is clear need for preparation in the event of an accident. We see that how the trends of the fast wave decreased in the event of an accident including the influence of the topography. We set this prediction earlier at the time of launch using the results of such disseminations. This technology is applied to the design of front carriers for high-speed trains to reduce the threat of atmospheric pressure waves in the tunnel. It was used for the design of front carriers of the 503 model of Syncanten(?) of the West Japan Railway and for the design of front carriers of the Linear(?) motor car, that is explained by Central Japan Railway.

The next category, open level of collaboration. Open level is programmed to support the participation in commercial space business. In this

programme, JAXA cooperated with companies and universities with unique areas and superior technology, aiming at the creation of commercial space business of new ideas and also to apply superior ground technology into space, for example, the research for life support in space.

The clothing it developed so that the astronauts can work effectively and comfortably in the ISS. Astronaut Dr. Doy(?) wrote it in his recent reply. Furthermore, it is expected to become a spin-off in clothing and bed clothing for people needed _____(?) care over which this ability.

And sport shoes for astronauts long-term stay, based on a _____(?) Russian(?) astronaut Dr. Sergei Aider(?), sport shoes are developed with _____(?) for astronauts staying for a long time in the ISS to overcome the burns(?) and to decrease it caused by micro-gravity.

Last category, the Japanese field food programme as space certification(?). Space foods are developed for the purpose of contributing and maintain nourishment for the astronauts in the ISS and to reduce their mental stress. It is a programme to satisfy the food which Japanese people each daily are Japanese fresh foods.

Twenty-nine items have been already certified(?) last year. For example, the _____(?) Food Corporation Service _____(?) and Yabach(?) Baking Corporation says _____(?), it is _____(?). These efforts are in _____(?) fresh such as the Souvenir Shops in science museums and especially children enjoy them.

Full supporting the programme that I introduced of JAXA's Cosmos Project. JAXA established a JAXA Space Plant to promote the utilization of space technology and its results. The _____(?) private company entered _____(?) and developed that of commercial space business.

Planned summary. We would like people to use space development technology more widely. We would like people to space _____(?) advanced closer, therefore, a product development project which was established to bring the affluent(?) areas that come out of Japanese space development to the daily lives of more people, good and _____(?) for general customers developed by projects.

Branding is expected by granting the produce of the roadmap. We are alerting many _____(?) and concluded contracts for the use of

the roadmap, including the _____ (not clear) and the new Meditech(?) which I introduced previously.

JAXA looks forward to seeing many companies using this logo and I hope that many companies will support our programme and see this logo everywhere in the world. Thank you for your attention.

The CHAIRMAN (*interpretation from Spanish*): Thank you very much Mr. Nagatomi and to JAXA for this presentation of its Industrial Collaboration Section. While we feel that of perspective work here and how space applications can be used in different fields of great importance from recycling, especially for long-distance space flights and in particular for water purification in space, mixing it with tea, coffee, vinegar and perhaps beer as well, as well as your work with open laboratories on space clothing, very interesting. I was particularly impressed by the Japanese Space Food Programme and your space courier(?), that must be very interesting, have a new set of menus with different kinds of food. Thank you very much then, very interesting. Of course, the subject would have to be planned and thought about and I now that you will be making a very significant contribution.

My last presentation for today is going to done by Dr. Neumann from the DLR in Germany, "Space Perspective on Ocean and Inland Waters". You have the floor Mr. Neumann.

Mr. NEUMANN (German Aerospace Agency, DLR): Thank you Mr. Chairman, distinguished delegates, ladies and gentlemen. Let me first thank you for this opportunity and to give a brief overview on what I call the Space Perspective on Ocean Coasts and Inland Waters. The intention is give an insight what is possible using space technology in assessing the state and contributing to the solution of daily problems in the field of ecology.

This is usually the view that we have on Earth. We see the continents and even if we look on an atlas, the oceans usually appear as dark or maybe blue surfaces, but looking into the truth, as shown in this movie here, the oceans are not only black holes on the map but they are very dynamic, here showing the biological activity as it is distributed in the oceans. So one of the aims of marine remote sensing is to provide parts of the view that we need to understand the ecosystem Earth as we see it here joined together from the ocean and the land side.

The oceans are very dynamic as, for instance, is shown here in a modelling of waves on the Atlantic Ocean based on a Synthetic Aperture Radar measurement and we see that the oceans are a very dynamic system and space technology provides one very good tool to assess what is happening there.

And the same is, just to give some examples, with the surface temperature, one of the parameters that is of interest on the one hand, for climate research for assessing the state of environmental changes, and on the other hand, one of the parameters which is impacted highly by changes due to immense activities.

So we have several impact chains which we have to look at and where the ocean plays, the waters are playing a big role in there, I will not name all of them, just for example here, we have impacts from the biosphere to the CO₂ cycle, this again to biodiversity, and then food provision for mankind. We have physical processes going on. They are the basis of weather, weather, again, is an interaction or has inter-dependencies with climate and climate change. This again influences the biosphere and so we could build several other impact chains which all include either the global oceans coastal water regions or even inland waters. And this is why we are interested to look at waters and all of their kind because we have to find solutions or to provide parts to solutions to reach sustainability under environmental problems growing, population growth and other challenges that we are facing.

How can space technology help in that? As for other subjects too, space technology provides us with a global spatially-resolved and dynamic view on biosphere and on geophysical processes, and looking at waters and oceans is not so new and space technology had started somewhere in the middle of the 1980s and has reached, as I will be showing in a moment, a very operational level nowadays.

New technology which was coming up the last six to 10 years and which is still coming up also in the next three to five years with new instrumentation, new satellites, helps us not only to look at the global picture, but also allows us to get the regional details which are becoming more and more important. And so we have possibilities to understand the inter-dependencies, interactions and impacts on different states.

We have in principle three different ranges or scales we have to look at and they play a different roles in these impact chains. One is the global scale which are the oceans themselves. That was the first thing we

were able to look at using space technology. Then the focus moved to the coastal zones, which means on a continental or even regional level, which is one of the major focuses in the last five to 10 years maybe, and starting to get into the focus of space applications or remote sensing from space, are now inland waters which are on a regional and local scale and technology allows us to get into the details of this too.

It was said in previous presentations, and I think most of you know about the reasons or the challenges we are facing and why we have to look at all the environmental factors. That is why I will not explain this in detail here.

Anyway, we have two points, especially why water is of interest. It is a critical resource for mankind, on the one side, and on the other side, it is a very sensitive ecological indicator. Whatever is changing in ecology, we see it mostly very fast in the state of our water resources.

This is, now again I will not explain it in every detail, but this is an overview and these two titles, the one and the one following which just gives an overview what kind of phenomena we can look at from space. We have temperature, I have already said a few words on that, we have wind, which is one of the driving forces in environment, but also a threat to _____(?) in the sense of ship transport, etc., so we have appropriate technologies to look at the wind from space. We have waves, again as a major physical driving force in the environment and a threat, on the other hand, we have coastal morphology which is one critical point also to look at, in the natural sense, change of coastal morphology, but also coastal erosion after disasters as they are happening more and more in different places of the world.

We have pollution in a lot of specific senses, being it oil or being it waste, whatever, so the technologies are available to look at all these phenomena. And we have, on the other hand, the opportunity to look into the water that is used to assess the biological state of the waters by looking at the photo-plankton concentrations or species of certain plankton looking at harmful or even toxic algae blooms which are becoming a more critical problem in several regions of the world's oceans.

We can look at suspended _____(?) absorbed substances which are giving us traces to understand the distribution of harmful substances, especially in estuaries, river mouths and along the coast.

Ice cover, of course, is something which is very obvious but we are able to see that and also a role in this kind of remote sensing are playing aerosols which have a role for irrigation budgets, for climate research but also in the sense of air pollution, and, of course, we have to count for it as a disturbing factor.

How does it work in practice? This is an example which I took from a German newspaper where a photographer was travelling around the world and taking photos in different parts because he noticed that the water is changing its colour. And the colour is even what we can see from space and the colour is built by the properties of substances which are in the water and by measuring this colour, we are able to devise quantitatively the different water constituents such as photo-plankton or suspended inorganic matter, the dis_____ (?) organic substances, as I was saying. And that in the end gives us, on the one hand, parameters to assess water quality, bio-productivity of primary production and their contribution in the carbon cycle.

So this is just an example how an ocean or a sea might look like from space. This is the Black Sea and we see that it is firstly not black and secondly, it shows very dynamic features and all this what we see here are different kinds of biological activities, sediment distribution, whatever, in the sea, and by taking these data we can really count or compute the numbers at grams per kilo_____ (?) which are in the water. This is another example of the Ghanga (?) River, which is a very dynamic region also along the coast.

That was optical data, that means looking in the same spectral range as a normal photo. A video camera, another technology is to use Synthetic Aperture Radar. This here is an example, looking at the ocean around Tenerife Island and you see already that there are a lot of structures being seen and these structures correspond to physical processes going on in the water column or at the water surface. It will make this cut-out here and in a little bit you see the wave structure and by looking at the wave structure, we are able, on the one hand, to compute the waves in the ocean, we are able to compute wind driving the waves, wind direction and wind forces, etc., such as using these kind of images by the Canadian RADARSAT which is an image of the Hurricane Floyd in 1999. And we can use these kinds of images to compute wind speeds and wind directions over the ocean.

So this is basically how it is being done technologically. And we can say that currently worldwide, we have a good fleet of satellites available

which cover almost all technologies which are possible up to date. It is not possible to list all of the satellites here, all of the instruments, I just wanted to say that this slide but we have a good fleet of satellites which allow us to move to operational applications and to introduce this kind of data, of information, into daily life of man.

The last important for us, coming from Germany, from Europe, currently Data Source is the European environmental satellite, ANDESAT (?), which basically talking about the ocean has two instruments on it and the optical part, the medium resolution imaging spectrometer, NERIS (?), and Photo-Synthetic Aperture Radar, who are indicated by this huge antenna, the Advanced Synthetic Aperture Radar. I think most of you know about this satellite. It is a huge thing flying since 2002, hopefully will continue to work until 2010 or maybe even longer, because it is one of the most important sources of data for us in the environmental and especially ocean- and water-related research and application department.

A new child up there, and available for research and applications since the beginning of this year's a national satellite from Germany named TERRASAR (?). It is an X-Band Synthetic Aperture Radar Satellite which gives us very high resolution radar data for a lot of different applications, and I will be showing examples from that in a minute.

I am going through some examples how the results of this satellite assessment of water, oceans look like. This is an example which I took from the SEVIS (?) satellite of Orbital Sciences in NASA showing the global distribution of photo-plankton indicating to us the biological activity, how it is spread around the globe.

This is one of these phenomena laying on the table there. We are facing a growing number of critical toxic algae blooms in different parts of the world. This is an example from an image taken from two different satellites, one being the MODIS (?), on the right side, and MOSS (?), on the Indian satellite on the left side, showing an extreme algae bloom in the Baltic. This is a toxic bacteria bloom and it threatens all the agriculture along the coast which are very intense in the Baltic Sea and causes some ecological threat to the entire eco-system. So assessing this phenomenon, following it and trying to build up models and understand how it develops and how we can fight, there space technology really can contribute to ecological management.

We have moved forward during the last years towards operational applications in the European GMES Programme so this is a part that DLR is standing for. What we are doing currently is that for the Baltic Sea, for institutional users, in Germany we are providing on a daily basis, these kinds of maps of the most important water constituents and water quality measures, such as the water transparency. This is currently done using the mirrors of EMUSAT(?) instrument and, as I said, is in operational service on a daily basis.

What are still experimental are things like this where we use the same kind of data to assess the water quality in inland waters. Currently, due to the limited spatial resolution, we are able to do that only in larger lakes but within the next three or four years when the next generation of instruments will be available, we will also be able to do the water quality monitoring in inland waters on a regular basis, at least to lakes down to say half a square kilometre or so of size.

Another example which I took from a company which we are also working with, here is another application here, for example, in Australia. This is a comparatively new developed technology where optical data are used to map the sea floor and we also can map the water depth which is possible at the spatial density of the other instruments like sounding, etc., do not give, so this seems to be a very new application and a very interesting application in a lot of places.

Another example, which is a mixture of water and land. We have large areas of water and sea which is sort of a kind of a wetland along the European coast so routinely satellite data are also used to assess the quality of the waters in these wetlands area and also the main classification of the habitats in these, or the biotopes in these water and sea regions.

Moving now from the optical again to the radar imagery of this. Here is an example of TERRASAR-X image of the North Sea coast, and beside the wind direction which we can compute from the image. I have put that slide here just to show or to give an impression how very sharp and very clearly we can look at the morphology in these very structured areas using this kind of radar data which in the end allows our resolution up to roughly a metre or so and can be of new kinds of mapping independently of the current weather situation.

These are two more examples, also from TERRASAR-X on high-resolution wind fields that can

be computed from this kind of data. Here an example the English Channel and the Strait of Gibraltar.

Another issue where radar is used more and more also in the operational sense, or pre-operational sense, is the detection of oil pollution. There is also a large European project going on and a new agency funded a few years ago which is using this kind of radar data to detect and to monitor the distribution of oil slicks in European seas. So another contribution of space technology to water-related problems.

And I think this is the last example which also compared the very high-resolution that we get from the TERRASAR-X satellites, even allows us, here an example at Okinawa(?) to look at very high-resolution weight fields and they will contribute to a complete new understanding of physical processes as they are going on in coastal shelter buildings, harbours, ports or very narrow areas in the sea, to see it and to understand it, an annex there on how even hazardous winds or waves are influencing the environment there.

And I think that this was my last slide in the presentation. No, I just forgot to say that all these technologies which were developed during the past years, they have made a significant steps towards operational ability. There is an ongoing joint programme in Europe which is called Global Monitoring for Environment Security, the GMES Programme. It is both supported by ESA funding and the European Commission Framework Seven-Programme Funding, so there is running currently the Marine and Coastal Environmental Service, which is called MARCOS, that covers the entire European continent and provides the kind of services that I was showing here to all national authorities or users, also commercial users, in the European countries. It will be continued by the EU FB Seven-Funded Marine Corps Services, MYOCEAN, that starts in 2009 and will provide an overtake of the services from possibly 2010-2011.

And in addition, we have as possibly other European countries too, national projects which are, they are supporting the European-level activities by corresponding national developments to give specific services that are needed in the countries.

And that was my last slide. Thank you for your attention and I am ready for any questions that might be of interest.

The CHAIRMAN (*interpretation from Spanish*): Thank you very much Dr. Neumann from the DLR and its Tele-Observation Section. Very

interesting presentation. Are there any questions from the room?

You highlighted some very important elements, the topic of water in many different aspects, in particular oceans, coastal zones and inland water bodies, as well as the wetlands. These areas which have moisture and which often irrigate other areas and which, for many reasons, are an increasing threat of destruction. Thank you very much for these tools which I think can help us solve many marine biology problems, climate problems and safety of shipping and especially the last part on the protection of the environment and systems that your Centre is working on. Thank you very much on all our behalves.

That was our last presentation this morning. We shall resume this afternoon at 3.00 p.m. We will start with Space and Society, agenda item 11. I would like to conclude 9, Report of the Legal Subcommittee. Anyone wish to speak this afternoon on it? I see one. So we will deal with that and conclude this afternoon. Also we will deal with number 12, Space and Water, and we will begin our examination of 13, Use of Spatial Data for Sustainable Development.

We will have three technical presentations this afternoon. The first one from a representative of Indonesia, "Space Technology Education in Indonesia". The second one by a representative of the United Nations Geographic Information Working Group Secretariat on "United Nations Special Data Infrastructure". And the third one by a representative of India entitled "Use of Geospatial Data for Sustainable Development: The Indian Context".

There are no comments on this proposed schedule?

I adjourn this session. We will meet back at 3.00 p.m.

The meeting adjourned at 1.03 p.m.