13 50	14 10	*(20 min)*	**Speaker 2**	***Dr.* Ts. Batsaikhan,** *Researcher, The Research Center for Astronomy and Geophysics, Mongolia Academy of Sciences (MAS),* ***Mongolia*** **"Seismic Hazard assessment of Mongolia"**
14 10	14 30	*(20 min)*	**Speaker 3**	***Dr.* Yumiko Nara,** *Professor, The Open University of Japan,* ***Japan*****,** **"Sustainable Natural Disaster Management in Asia"**
14 30			**Session C**	**Land Cover Change and Urban Land Planning**
			Moderator	***Dr.* Yoichi Muraoka,** *Council Member, Science Council of Japan (SCJ),* ***Japan***
14 30	14 50	*(20 min)*	**Speaker 1**	***Dr.* G. Sarantuya,** *Director, Institute of Meteorology and Hydrology, Ministry of Environment and Tourism of Mongolia,* ***Mongolia*** **"Climate Change and Agriculture"**
14 50	15 10	*(20 min)*	**Speaker 2**	***Dr.* Robert M. Delinom,** *Senior Research Associate, Head Research Division Asia Pacific Center for Eco-hydrology,* ***Indonesia*** **"Land Cover Change And Heatland Phenomena In Urban Area: Greater Jakarta Case Study"**
15 10	15 30	*(20 min)*	**Speaker 3**	***Dr.* M. Erdnentuya,** *Senior Remote Sensing Specialist, Environmental Information Center of Mongolia,* ***Mongolia*** **"Land Cover Change in Mongolia"**
15 30			**Special Information Session**	**Science and Technology Research Partnership for Sustainable Development (SATREPS)**
15 30	15 45	*(15 min)*	Presenter	***Dr.* Cindy Yoshiko Shirata,** *Council Member, Science Council of Japan (SCJ),* ***Japan***
15 45	**16 00**		**Tea Break**	
16 00	**17 25**		**Panel Discussion** *(+Summary) (85min)*	
			Moderator	***Prof.* Tuvdendorj Galbaatar,** *Secretary General, Mongolia Academy of Sciences (MAS),* ***Mongolia***

Paneler 1	***Dr.* J Tsogtbaatar,** *Director, Institute of Geoecology, MAS,* ***Mongolia***
Paneler 2	***Prof.* D. Amarsaikhan,** *Head of Section, Institute of Informatics, Mongolia Academy of Sciences (MAS),* ***Mongolia***
Paneler 3	***Dr.* O. Batkhishig,** *Head of Soil Laboratory, Institute of Geography, MAS,* ***Mongolia***
Paneler 4	***Dr.* Tetsuzo Yasunari,** *Council Member, Science Council of Japan (SCJ), Professor, Hydrospheric Atmospheric Research Center (HyARC), Nagoya University,* ***Japan***

Closing

17 [25]

Closing Remarks

17 [25] 17 [30] *(5 min)*

SCA Vice President	***Prof. Dr.* Lukman Hakim,** *Chairman, Indonesian Institute of Sciences (LIPI),* ***Indonesia***

17 [30]

***Prof.* B.Enkhtuvshin**
President of Mongolian Academy of Sciences (MAS),
Mongolia

Honorable delegates,
Mr. Deputy Prime Minster M. Enkhbold,
Minister L. Gansukh,
Ladies and Gentlemen,
Esteemed scientists and researchers,

The 11th SCA Conference id being held in Mongolia after one year and 21 days since the 10th SCA Conference that took place in the capital city Manila of the Philippines.

I would like, at the outset, to thank on behalf of the Mongolian Academy of Sciences to the Science Council of Asia for the opportunity to organize this prestigious Conference in our country.

The SCA Management Board Meeting, General Assembly meeting and SCA Joint Project Workshop which started yesterday within the framework of the SCA Conference and this International Symposium are the works of the Conference.

Yesterday, The Management Board meeting and the General Assembly meeting were completed successfully and the SCA Joint Project Workshop under the heading natural disaster, pop culture, open data for knowledge environment and e-science continues a whole day at the Mongolia-Japan center.

These meetings were attended by over 120 delegates representing the SCA member countries and scientists, who did research on the issues discussed.

Today, we are going to hear reports of the researchers under the theme of Combating Land Degradation in Asia" on the state of the desertification I Mongolia, factors that affect it, scientific rationales for combating climate

warming and land cover change, about latest technology being used for land degradation and desertification. Also, the member of the Government will speak on the measures and steps taken by the Mongolian Government for combating desertification and land degradation.

The natural science institutes of our Academy of Sciences have been conducting their researches on the desertification and land degradation in Mongolia. We have expanded the Desert Research Center under the forest research and its use of the Institute of Geoecology into a part of this Institute and the research on desertification in Mongolia was made a priority area of its scientific research. The implementation of science technology project and basic research subjects at the center made it possible to create, for the first time, a map of the unified assessment of desertification in this country and established that the 72 percent of the entire Mongolian territory was affected to one way or another.

Our researchers have also established that the desertification and land degradation in Mongolia have been intense particularly in the ecotone zone dividing the Gobi desert and grassland and here, where the climate-related desertification is most active. Therefore, preparation are underway to establish the “Desertification Experiment and Research Center” at a place called “Elsen Tasarhai” which is a representative place for steppe for the purpose of studying in detail the desertification process where desertification is particularly intense and to introduce a pilot research technology for reducing this process. Our researchers have been studying and registering the modern technology and means at this center in order to introduce them in reducing the desertification and land degradation.

Our Government pays a particular attention to the issues discussed at this Conference and I am pleased to note that the Deputy Prime Minister of Mongolia and members of the Government concerned are taking part and presenting reports.

I am confident that for purpose of taking scholarly initiatives for reducing the natural disasters and combating them, the valuable advises of the members of the Science Council of Asia are indispensible. We will work together the our Government to materialize these initiatives.

I now declare the SCA International Symposium open and with every success in its work.

Thanl you for your attention.

H. E. Mr. M.Enkhbold
Deputy Prime Minister of Mongolia,
Mongolia

Honorable participants of the SCA conference
Esteemed researchers and scientists,
Ladies and Gentlemen,

At the outset, let me express,on behalf of the Mongolian Government and myself, my sincere thanks to the Science Council of Asia for the opportunity to organize this prestigious Conference in our country.

It is very important that this 11th SCA conference is being held in Mongolia under the theme of "Combating land degradation of Asia" in a country according to the definition of the United Nations Convention on Combating desertification, where a large portion of its territory is most vulnerable to desertification and land degradation.

According to our researchers, within the last 70 years air temperature in Mongolia has increased by an average of 2.1 degrees, as a consequence, the surface water area decreased by 36 percent, glaciers by 31 percent, dry plain area by 28 percent, forest area –by 8 percent where as sand covered area increased by 46 percent and desert-steppe area 68 percent.

As the Convention on Combating Desertification estimated the desertification of Mongolia as of 2008 that 72 percent of the entire Mongolian territory was affected by desertification, from which 23 percent slight, 26 percent medium, 18 percent strong and 5 percent very strong degree of desertification.

The Mongolian desertification can be divided into natural and artificial factors. The natural factors include climate change induced by global warming, strong wind, dust storm, frequency of rain storm,

drying of rivers and springs and soil fertility decline. The artificial factors include overgrazing, mining activities, agriculture, population migration or excessive urbanization, forest fire, destruction of forests. Therefore, there is an imperative need for protection of non decertified areas against desertification, prevention activities or develop enterprises suitable for the given ecological capacity. As for the already degraded areas, it has become essential to do everything to eliminate all the negative consequences and to approach in accordance with the ecologically differentiation.

In 1996, Mongolia joined United Nations Convention Combating Desertification and and gave assessment to reality of desertification in the country and developed Government program and nature ecological policy. In 2003 the National Committee for Combating desertification was established by the Government which identified policy and outlines.

As a member country of the Convention, the Mongolian Government developed and implemented its National Program Combating Desertification in 1996 and 2003. Within this program, the major attention was focused on improvement of national capacity building for combating desertification and legislative environment. In order to ensure the ecological balance and to pay renewed attention to the improvement of the population's living standards through preventing and reducing future desertification and land degradation, the Government of Mongolia adopted 2010 new version of National Program Combating Desertification for the period of 2010 and 2020.

Beside the National Program Combating Desertification, the Mongolian Government has been implementing more than 20 major programs including the National Program for the Forest, the National Green wall Program, the National Water Program, the National Program for Climate Change etc.

"Climate Change National Program" was renewed with the aim of preserving ecological balance, conforming the development of social economic sectors with the climate change, reducing their vulnerability risks and increasing the benefits and efficiency of the production through reducing greenhouse effects and promoting a green economy development.

Due to climate change and improper human activities, the forest resource has been depleting, desertification, sand movement, dust storm process intensified and ecological conditions worsening. To support public activities for greening, forestation and combating desertification, the Mongolian Government adopted in 2005 “Green Wall National Program” with the purpose of creating long term step by step green zone and a forest covering the belt region between the Mongolian Gobi desert and plateau and within five years since that time 2500 hectare land has been greened, forested, and tree living rate reached 75-90 percent.

The “Forest National Program” adopted in 2001 aimed at reducing the impacts of negative human activities, forest management, its organization structure, introducing new advanced methods and technology in forest protection and enhancing tree seedling planting activities. There is an imperative need, in the first place, for a forestation of river upstream, forest areas affected by timber industry, fire, insect and diseases.

The Water National Program was renewed in 2010 with the aim of rational use, conservation, unified and improved management and reuse of water resources, of laying down of general management policy for proper use, conservation of resource is important strategic goal8 ingrease water collection ponds, using river, spring, rain, snow melt waters and investigation of water resources in arid, water scarce regions.

There are some concrete work was done to improve desertification assessment methods. For instance, the Ministry of Environment and Tourism adopted “Guidelines for Land degradation, Desertification Assessment, Report writings procedure”, “Desertification assessment methodology”. To improve legal environment for combating desertification, a draft law on Soil conservation and Combating Desertification was developed for approval by the Parliament.

A number of international organizations and donors countries have been supporting our efforts to fight desertification. For example: “Sustainable Pasture Management”, “Desertification combat and Land sustainable management” projects of UNDP, “Desertification mitigation” project of Swiss Development Agency, “Combating Dust Sources” projects from Japan’s “J-green” organization, and “Green wall” project from the Government of the Republic of Korea.

Last year, the Government held a special session in the Gobi desert. The desertification has now become a pressing issue of over billion peoples of more than 100 countries of world. Climate change induced, improper agricultural practices have been causing land degradation threatening peoples food security, consequently their livelihood. The Mongolian government has expressed its resolve in its resolution adopted by its Gobi desert session to combat desertification within the framework of UN's10 years of Combating Desert and Desertification.

Despite the many projects, programs and other efforts that have been implementing by the Government, tangible results not have been achieved beyond giving assessments to the present day desertification status. Therefore, we believe, it is imperative to study the desertification status and its tends on a scientific basis, to identify the accurately the ecological factors, its natural and anthropogenic impacts, develop the scientific methods, approaches for combating desertification and to improve the efficiency of Government projects, national programs. No less important is the active more involvement of scientists to identify the best ways for sustainable development of Mongolia, that would lead the country towards an ecologically rich economy.

This is why we attach a great importance to the fact that the 11th SCA Conference is now taking place in this country. I believe that, scientific ideas and recommendations from this Conference will help a great support for combating and mitigation of this natural disaster our country is facing.

Wish a success in the deliberations of the 11th SCA Conference.

Thank you for your attention.

Report on the Nuclear Power Plant Accident in Japan

Prof. **Ichiro Kanazawa**
Immediate Past President,
Science Council of Japan (SCJ),
Japan

Introduction

The presentation aimed to briefly report on the Great Earthquake of the East Japan, particularly on the nuclear accident happened at the Fukushima Daiichi Nuclear Power Plant of Tokyo Electric Power Co. Ltd, in short “TEPCO”.

1. Earthquake

What happened first at 2:46 p.m. on 11th March was the huge earthquake, whose magnitude was, at first 8.3 and 2 days later went up to 9.0. The seismic source of this big earthquake was located off the coast of Miyagi Prefecture. The earthquake seems to be due to the release of the accumulated energy by sinking down the Pacific Plate underneath the North America Plate.

2. Tsunami

The second event was Tsunami happened 15 to 60 min after the earthquake. Heights of Tsunami were more than 10m in the Pacific coasts at least 200km long. Energy of the Tsunami was extremely powerful and the numbers of dead persons went up to more than 15,000.

3. After Tsunami in Kesen-numa

The photo was taken by the person of Newspaper Company in the next early morning in Kesen-Numa City located just in the middle of the North-East Japan. It is extremely impressive that there is a big ship mixed with the numerous destroyed houses and rubbles. This is an unforgettable scene.

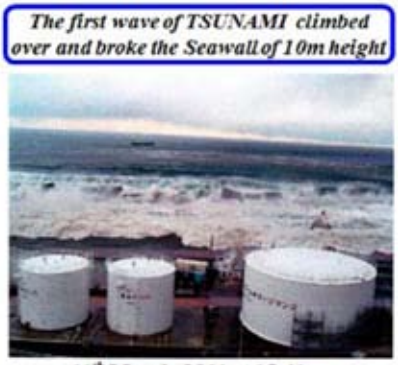
4. Nuclear Power Plant Accident

Of the six reactors at the TEPCO Fukushima Daiichi Nuclear Power Plants, Units 1, 2, and 3 were in operation at the time of earthquake. Units 4, 5 and 6 had been shut down for regular maintenance. All of the fuel in the reactor core of the Unit 4 had been transferred to the spent fuel pool in order to conduct regular maintenance. By detecting the earthquake, the nuclear reactors and turbines of Units 1, 2 and 3 stopped automatically. Although the buildings were escaped from collapse by big quaking, transmission line towers, as shown here, and other equipments collapsed, preventing Units 1 through 6 from receiving external electric power.

Approximately 1 hour after the earthquake, the major tsunami hit the turbine building. Thus, the emergency electric generators at Units 1 through 4 failed and stopped operating. Therefore, Units 1 to 4 can't constantly cool the reactors.

5. The first wave of Tsunami destroyed the Seawall

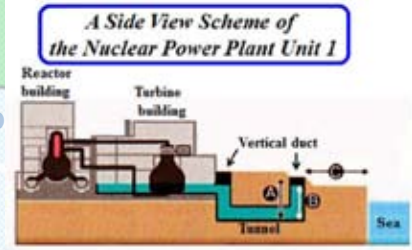
The photo was provided by TEPCO. This was taken nearly 1 hour after the earthquake, and



exhibited just the arrival of the first wave of Tsunami which climbed over the Seawall of more than 10m in height and destroyed it.

6. A side view of the nuclear power plant Unit 1

In order to make understanding easy, I would like to show a scheme of the nuclear power plant unit 1 from the side view. The right direction is the sea side. The turbine building for equipments for cooling the reactor and the reactor building itself were located in this order from the sea, and not higher than 20 m from the sea level, and also less than 500m distant from the sea shore.



A: Depth of the vertical duct (approx. 16m)
B: Depth of contaminated water (approx. 16m)
C: Distance of the duct to the sea shore (56m)

7. Tsunami photo ®

This is the first one of the series photos taken, 1 minute after the collapse of the Seawall, from the fixed point between the turbine and the reactor buildings. Please notify the invading Tsunami front to the narrow space between the two buildings. Also, please remember the height of the two white tanks.

11th March, 2011 at 15:42

8. Tsunami photo ©

Within 1 minute after the previous photo taken, the space between the two buildings was filled with the hazy spray of Tsunami, and it is rather difficult to recognize the white tanks.

11th March, 2011 at 15:43

9. Tsunami photo ®

Just after the previous photo was taken, the volume of the muddy stream of Tsunami increased up to the level of the top of the white tank. Please notify the white motor car parked at the left corner of this space was transferred to the wall of the turbine building and was perpendicularly standing.

11th March, 2011 at 15:43

10. Tsunami photo ®

Within 1 minute after the previous photo taken, the level of the Tsunami reached to the peak, but the turbid Tsunami was still violently waving and wriggling.

11th March, 2011 at 15:43

11. Tsunami photo (5)

Less than 1 minute after the previous photo taken, the power of the Tsunami as though it is, subsided a little bit and the heads of the white tanks reappeared again.

11th March, 2011 at 15:44

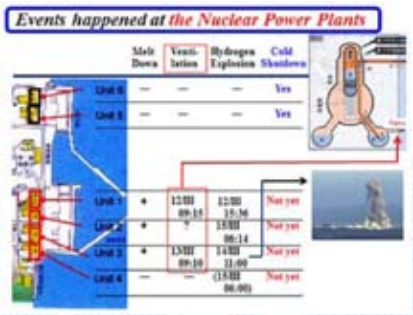
12.Tsunami photo @

This is the last photo of this series taken 3 minutes after the first wave of the Tsunami coming to the sea shore. Do you remember this perpendicularly standing white car? It is noteworthy that the car destroyed the wall of the turbine building and thus the muddy sea water invaded into the turbine building, in which the emergency electric generators were operating in order to cool the reactor in

11th March, 2011 at 15:44

the reactor building.

13. Events happened at the nuclear power plants



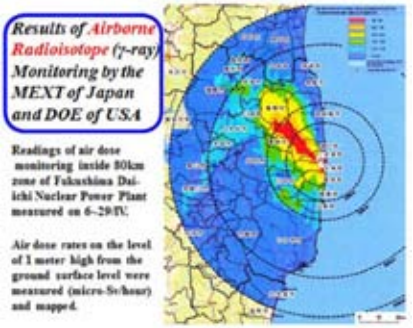
This slide is showing the mutual position of the Units 1 through 6, and the events happened after the earthquake and tsunami.

Unit 5 and 6 had lost external power as a result of the earthquake, but a single diesel generator remained in operation and conducted emergency cooling. Thus, cold shutdown was achieved for both of these two reactors on 20th March without melt-down, ventilation and hydrogen explosion.

On the other hand, in cases of Units 1 through 3, as a result of the total loss of electric power, the ordinary route of released heat to the sea water was cut off. The adequate cooling could not be conducted and the fuel rods were exposed and, as officially announced first time more than 2 months later, fuels inside the reactors were melt-down at the early stage, but fortunately mostly stayed inside the reactors. As a result, the temperature of the fuel rods rose rapidly, and the zirconium in the zirconium alloy fuel cladding tubes reacted with the water, producing large quantities of hydrogen gas. This increases the pressure of the vessel. In order to lower the pressure, the ventilation was performed by opening the valve, but unfortunately the hydrogen explosion occurred.

On the slide, there is a photo of the hydrogen explosion occurred in the Unit 3 in the morning of 14th March. I will show later the chronological relationship between these events and the governmental Instructions to the public.

14. Airborne Radioisotope



Planned ventilations of the reactor valve and the unexpected hydrogen explosions brought about the release of radioactive materials, mostly iodine131 and cesium 134 and 137 which are radiating gamma-ray.

From 6th to 29th April, the Ministry of Education, MEXT and the