



MINISTRY OF  
INDUSTRY AND AGRICULTURE



# Summary Report

## **High-Level Forum on “Climate Change and Food Security in the Landlocked Developing Countries and Small Island Developing States in Asia and the Pacific Region”**

*Conference Hall, Ministry of Industry and  
Agriculture, Ulaanbaatar, Mongolia*

Wednesday 12<sup>th</sup> March 2014

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**Summary of Conclusions and Recommendations:**

The “High-Level Forum on “Climate Change and Food Security in the Landlocked Developing Countries and Small Island Developing States in Asia and the Pacific Region” was held on 12<sup>th</sup> March 2014, at the Mongolian Ministry of Industry and Agriculture, Ulaanbaatar, Mongolia, with the aim to address food security and poverty reduction among the LLDCs and SIDS in the face of climate change. The Forum was attended by 70 participants who included 17 ministers from the respective countries. The following is a summary of the conclusions and recommendations of the Forum. An expanded summary of the deliberations is included in this report.

**Summary of Conclusions**

- Climate change is real and its impacts on the LLDCs and SIDs are severe.
- Food security is one of the most challenging issues faced by LLDCs and SIDs currently, which is further exacerbated by the impact of climate change.
- To mitigate the impact of climate change on food security, there is an urgent need for countries to create an enabling environment with appropriate policies, laws, infrastructure and finance, and incentive-led technologies for adoption by farmers.
- Concrete country actions must be implemented on community-based disaster risk management approaches which are coupled with awareness raising at all levels.
- Strategies to support food security at various levels are required; these could be done through demonstration of climate-smart agriculture practices and community-based agriculture system.
- There is an immediate need to strengthen the capacity to monitor the progress in agricultural productivity and provide timely assistance to farmers to reduce loss.
- There is a need to strengthen the regional collaboration and coordination to build capacity and transfer climate-smart agriculture technology from Asian countries to the Pacific Island Countries (PICs).
- Regional actions to strengthen capacity of national governments and communities are required.
- Enforcement of forestry- and fisheries-related regulations to minimize illegal logging and illegal fishing is urgently needed.
- A regional policy framework for strengthening the fisheries sector is needed.
- A resilient and adaptive fishery management system needs to be developed.
- The lack of financial and human resources poses difficulties for countries to implement the policies efficiently.
- There is a need to improve institutional capacity.

- Support is requested from international donor community for strengthening climate change adaptation and mitigation and their synergies.
- There is a call for a collective act to improve information sharing and networking and to identify joint international development mechanisms.
- A multi-sectoral approach is required to develop an integrated approach to increase resilience and adaptive capacity.
- FAO is requested to act as a catalyst to increase information sharing for SIDs.

### **Summary of Recommendations**

- Special emphasis should be placed on blue growth development in the Pacific Region, and resilient and adaptive fishery management systems should be developed.
- Cooperation between Small Island States must be strengthened in their advocacy of regional interests at international forums on climate change and agriculture.
- Funding commitment from the donor community and UN agencies, including FAO, should be explicitly committed, allocated, and expeditiously disbursed in alignment with strategic national plans.
- Support for capacity building on climate change adaptation and mitigation as well as food security should be enhanced.
- Research capacity in livestock production and development, forestry, and animal health should be increased.
- Sustainable management of natural resources on a landscape basis, including watersheds, rivers, forests, grasslands and rangelands, should be promoted.
- Climate-smart agriculture is increasingly gaining recognition as an innovative approach to address the challenges of climate change and food security. It is recommended that FAO leads international efforts in promoting the adoption of climate-smart agriculture among these countries with a well-defined plan of action.
- Climate monitoring and forecasting and early warning systems as well as disaster risk reduction mechanisms should be developed and strengthened, including in the Himalayan region.
- Investment in agriculture research, including studies on stress tolerant varieties, should be increased.
- The number of members representing the Southwest Pacific region in the FAO Council should be increased to better reflect the voice of the region and the countries concerned.
- Quality water resource management and the promotion of water conservation technology should be strengthened.



## **High-Level Forum on “Climate Change and Food Security in the Landlocked Developing Countries and Small Island Developing States in Asia and the Pacific Region”**

### **Introduction**

Scientific evidence for global warming is no more in the realm of debate – it is now accepted as a reality. The increase in temperature globally is beginning to set off changes to climate, which include shifts in rainfall patterns, sea level rise, and increase in glacier melt. Climate change appears to further exacerbate the impacts of droughts, floods, and other extreme weather events. In such a scenario, the agriculture is perhaps most highly vulnerable to the effects of climate change. Changes in temperature, rainfall, extreme weather patterns and higher CO<sub>2</sub> in the atmosphere will mostly have deleterious effects on food production. For example, increased temperatures can reduce crop yields through dehydration, pollination failure, and an increase in pest and disease pressure. Sea level rise and saline intrusion can reduce viable crop areas. Droughts and floods can destroy entire crops for the season. To cap them all, agricultural activities also result in substantial amount of greenhouse gas emissions, further contributing to climate change. This, in the face of projected population of 9 billion by 2050 calls for serious action.

So, adapting to the impacts of climate change is crucial, as it is not merely an environmental problem, but one that affects all dimensions of livelihoods. It is certain to diminish all the development gains described under the Millennium Development Goals that have been achieved so far, and any considerations of sustainable development will have to take into account the risks posed by climate change.

While climate change is likely to affect every part of the globe, another facet of climate change is that it is going to affect the developing countries, especially the Least Developed Countries far more severely. This was reiterated by the United Nations Framework Convention on Climate Change (UNFCCC): Article 4, paragraph 9 of the Convention particularly requires that “Parties shall take full account of the specific needs and special situations of the least developed countries in their actions with regard to funding and transfer of technology”. With this in view, the Office of the High Representative for Least Developed Countries, Landlocked Developing Countries and Small Island Developing States (UN-OHRLLS) commissioned a study on the impact of climate change on these countries<sup>1</sup>. The study highlights that climate variability and change will seriously endanger sustained agricultural production in Asia in the next decades, and countries will become increasingly dependent on food imports. Considering climate change is unlikely to be arrested in the next few decades, adaptation is the only option for these countries. With respect to agriculture, a range of adaptation practices are emerging, including diversification of livelihoods and institutional changes. For their successful adaptation, some of the recommendations included regional arrangements and pooling of resources, enhancing technical capacity, and for the international community to provide stronger financial and technical support for the Least Developed Countries and Small Island Developing States.

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<sup>1</sup> UN-OHRLLS. 2009. The Impact of Climate Change on the Development Prospects of the Least Developed Countries and Small Island Developing States. United Nations.

From the context of the Asia-Pacific region, all the countries are likely to be impacted from climate change, although not all of them negatively. Agricultural production in some countries in the northern latitude may be better. However, the group of countries under the Landlocked Developing Countries (LLDCs) and Small Island Developing States (SIDS) have received very little attention, but are extremely vulnerable to the impacts of climate change. The irony is that these countries' contributions to greenhouse gas emissions is minute, but are likely to bear the brunt of the impacts. Among the LLDCs in the Asia-Pacific region, Afghanistan, Bhutan, Lao PDR and Nepal are mountainous countries, with the majority of the population living in rural areas and dependent on agriculture for their livelihoods. The exception is Mongolia which is classified as a middle income country, with a population that is mainly urban, and an economy supported by the mining sector.

The SIDS include the islands in the Pacific Ocean (Cook Island, Fiji, Kiribati, Marshall Islands, Micronesia, Nauru, Niue, Palau, Papua New Guinea, Samoa, Solomon Islands, Timor Leste, Tonga, Tuvalu and Vanuatu) and the Indian Ocean (Maldives). Climate change is already affecting the islands. Climate variations and extremes have disrupted food production, water supply, and their economies. The prediction is quite dire as well, that sea-level rise may drown out some of the islands completely.

With the aforesaid challenges from climate change faced by LLDCs and SIDS, there is a need to review the issues of food security. Food security is not merely concerned with production. Several criteria have to be met:

- Food availability – refers to the supply of food through production, distribution, and exchange;
- Food access – refers to affordability and allocation of food, as well as the preferences of individuals and households;
- Food utilization – refers to safety and nutritional value; and
- Stability – refers to ability to obtain food over time.

Considering the unique needs for LLDCs and SIDS with regard to food security under the impact of climate change, FAO has been directing additional efforts to bring about sustainable solutions. The opportunity to discuss these issues with the LLDCs and SIDS from the Asia-Pacific region came about with the organization of a High Level Forum on food security in parallel with the 32<sup>nd</sup> Session of the Asia-Pacific Regional Conference, held in Ulanbaatar, Mongolia, 12<sup>th</sup> March 2014. The participants included ministers and senior officers from LLDCs and SIDS. The overall objective of the Forum is to address food security and poverty reduction in the face of climate change in the LLDCs and SIDS. The Forum was also designed such that the participants from the more developed countries could share their knowledge and understanding with those from the LLDCs and SIDS. The Forum provided the platform for countries to inform their current status, successful approaches that are being developed, and how countries can implement them with appropriate capacity building, institutional strengthening, and alignment of policies to enable such developments.

The key objectives of the Forum were to:

- Share knowledge and experience on the impact of climate change on food security in the countries;
- Promote successful climate change adaptation and mitigation interventions for ensuring food security in vulnerable areas;

- Identify effective policy options to minimize negative impacts of climate change and enhance food security; and
- Develop concrete recommendations and actions for climate change adaptation and mitigation for food security following sustainable development and blue and green pathways.

Based on those objectives, the expected outputs of the Forum were:

- Participants able to exchange information on the status and preparedness of countries in their management of the impact of climate change on food security;
- Successful climate change adaptation and mitigation interventions for ensuring food security identified and discussed;
- Effective policy options and actions that would be taken to minimize the negative impacts of climate change and enhance food security identified and agreed;
- Key recommendations to reduce the negative impacts of climate change on food security in LLDCs and SIDS in Asia and the Pacific Region discussed and agreed; and
- A report summarizing the presentations and discussion at the Forum including conclusions and recommendations.

## **Summary of the Forum**

### **Session 1 – Opening:**

At the Forum, conducted in parallel with the 32<sup>nd</sup> Asia-Pacific Regional Conference in Ulaanbaatar, Mongolia, 70 participants (which included 17 ministers) convened on 12<sup>th</sup> March 2014 to discuss the food security issues of LLDCs and SIDS of the region under the impact of climate change. It was held at the Conference Hall, Ministry of Industry and Agriculture, Mongolia. The focus of the Forum was the shift from ‘business as usual’ approach to agricultural development, to one that takes into cognizance the impact of climate change on food security, and what development prospects exist for LLDCs and SIDS to bring about such a change. In this context, workshop presentations and discussions dealt with the unique situation LLDCs and SIDS are facing in terms of ensuring sustainable food security, emerging adaptation options available for such development, and the effective policy options that countries would need to achieve such a goal. Additionally, the Forum provided the platform for countries to share their experiences on impact of climate change on food security and the interventions for adaptation and mitigation.

The Forum commenced with welcome remarks by Mr. H. Konuma, FAO Assistant Director-General for Asia and the Pacific. He pointed out that while the worst consequences from climate change may be felt several decades ahead, but countries are already beginning to witness the adverse impacts of climate change on agricultural production and food security. While this will expose millions of people in LLDCs to poverty, hunger and disease, the rising sea levels may threaten the very survival of the SIDS. He reiterated FAO’s work on eradicating hunger and malnutrition globally, and highlighted the new initiative labeled “Climate Smart Agriculture”. He called on the participants to examine the triple solution: policies and programmes to enhance agricultural productivity and rural incomes, agricultural systems that are more resilient to climate change, and for agriculture to be part of the solution to climate change and not its problem. This was followed by the opening speech by H.E. Mr. Khaltmaa Battulga, Minister of Industry and Agriculture, Mongolia. He pointed out that all countries worldwide are facing problems with climate change, but it is the LLDCs and SIDS which are experiencing the worst of the impacts of climate change. The Forum should be an important platform for exchanging information and sharing knowledge on effective policies to bring about adaptation practices to limit the negative impacts of climate change.

### **Session 2 – Setting the scene:**

Mr. S. Appanah presented the structure of the Forum, introduced the facilitators who will support the discussions, and how the findings and recommendations will be circulated following the Forum.

### **Session 3 – Keynote speeches:**

Following the scene setting, two keynote speeches were delivered. The first was by Mr. E. Sandagdorj, Chief of Policy Development, UN-OHRLLS, who presented the address of Mr. Gyan Chandra Acharya, the Under-Secretary General and High Representative of UN-OHRLLS. The address pointed out how LLDCs share common handicaps which include geographical remoteness, high transport costs, and dependence on natural-resource based economies. SIDS too are similarly challenged with geographical isolation, high transport costs and limited land base. Food security among the LLDCs has been a perennial problem, with a large segment of the population undernourished. Climate change events such as erratic

rainfalls, floods and pest damage would only aggravate the situation. In the case of the SIDS, besides confronting similar challenges of the LLDCs, the small markets and narrow resource base of the former mean they are extremely vulnerable to climate change induced natural disasters. Considering most of their population lives in the zone less than 5 meters above sea level, they are under severe threat of inundation. In conclusion, the presentation provided several pathways to food security in the LLDCs and SIDS, and UN-OHRLLS is committed to supporting these initiatives.

The second keynote address on “Impact of Climate Change on Food Security: Asia-Pacific Perspectives”, Dr. Masa Iwanaga, President of JIRCAS, recounted the food security challenges under the impact of climate change, the specific challenges faced by countries in the Asia-Pacific region, and the technical solutions under development. The unique aspects of Asia-Pacific region include high population density and poverty, frequent extreme weather events, large coastal zones, diverse agro-ecosystems, large dry and semi-dry areas, and heavy dependence on livestock. Further, the region has limited scope for expansion of arable land. With huge populations living in the deltas, flooding can devastate their lives. Research is spearheading a number of innovations, including approaches which bring about higher agricultural productivity with the benefits of mitigation. Dr. Iwanaga emphasized that clear benefits and farmer participation are the keys for adoption of new technologies. He concluded with a call for regional collaboration to tackle climate change.

#### **Session 4 – Introduction to Climate Smart Agriculture:**

The keynote addresses were followed up by a short technical intervention by Ms. Khim Wirya on FAO’s “Climate Smart Agriculture”. Climate change will have direct impacts on the agriculture, forestry, fisheries and aquaculture sectors affecting food security of a growing population. Nevertheless, these production systems will need to sustainably produce more food with increased resource efficiency. With this consideration, FAO introduced the “Climate smart agriculture” (CSA) initiative beginning in 2010. CSA consists of three main pillars: sustainably increasing agricultural productivity and incomes, adapting and building resilience to climate change, and reducing and/or removing greenhouse gas emissions. This is achieved through a combination of agricultural practices suited for the specific site, with supporting policies, technology and financing approaches. While enhancing food security, CSA also contributes to mitigating climate change and preserving the natural resource base and vital ecosystem services.

#### **Session 5 – Heads of Agriculture Dialogue:**

The technical presentations were followed by the “Heads of Agriculture Dialogue”, an open forum where all the country delegates shared their experiences on the impacts of climate change on food security and the kind of interventions for adaptation and mitigation that are being employed. These discussions were stimulated by the following questions posed by the moderator, Mr. Erdenetsogt Odbayar, Director of the International Think Tank for Landlocked Developing Countries:

- What evidence is there for climate change?
- What is being done to overcome the impact of climate change and food security?
- What is the public perception on the impacts of climate change and how is awareness raised?

- What are the existing national and regional initiatives dealing with food security and climate change?
- What adaptation and mitigation measures are in place?
- What is the potential for implementing climate smart agriculture?
- Food security is not just a production issue, but is strongly dependent on supporting policies, institutions, and interactions with other sectors. How are the countries dealing with these issues?

The delegates contributed actively to the discussions, reflected on the current status of the countries in terms of food security, and the threats facing them with climate change. The following represents a summary of the discussions, itemized according to the topics covered:

- Delegates from Micronesia and Bhutan clearly articulated that climate change is no more a matter of debate, countries are unmistakably facing the challenges, ranging from sea-level rise, glacial melts, water scarcity, landslides and increasing incidences of weather extremes. These are additional challenges which require appropriate strategies for increasing agricultural output. There is an urgent need for new investment from the international community to address climate change adaptation and mitigation.
- Nepal pointed out that work is ongoing with donor partners in development of strategies and formulation of policies. However, their implementation is still lagging due to lack of financial resources and human capacity. A number of valuable approaches were expressed on how to overcome the impact of climate change on food security.
- Timor Leste pointed out that most of them are reliant on agriculture, and climate change is reversing their efforts to achieve food security. However, several reforms are being carried out in the area of policies and strategies to increase agricultural productivity, increase value addition, reduce malnutrition, and bring about sustainable management of the natural resources.
- Samoa, besides the above, is working at improving information flow, monitoring systems, and demonstrations of good practices. It is also working on bringing about multi-sectoral approaches to increase resilience and adaptive capacity in the face of climate change.
- Lao PDR reiterated on its situation, and pointed out that they are continuing to increase investments for farmers, improving their access to markets, and working on strengthening their resilience with programmes such as the early warning systems.
- Afghanistan too reflected on their situation, how drought and associated climate change impacts have damaged the lands and have resulted in huge crop losses.
- Several countries, including Papua New Guinea and Tuvalu, addressed the issues relating to climate change adaptation and mitigation. They indicated that most farming in their countries are based on small holdings, and are heavily impacted by droughts and changes in rainfall patterns. It is in their interest to also find solutions to climate change mitigation. Holistic and multi-sectoral approaches are being sought, that include reduction in GHG emissions through adoption of energy efficient measures, renewable energy, implementing REDD+ programme, and reducing forest degradation.
- Tuvalu further highlighted the value of adopting the roadmap for COP15 to help guide the way to address the impacts of climate change.
- Countries such as Fiji and Tonga were recently hit by cyclones. Fiji is refining its national climate change framework, and is shifting towards a green growth policy to build its climate change resilience and base its economic growth on such a platform.

Immediate areas of focus include waste management, energy, technology innovation, transportation, and food security.

- Tokelau, Vanuatu, Kiribati and Cook Island echoed the above views, and emphasized the need for capacity development for all the stakeholders.
- Climate smart agricultural approaches received considerable interest among the countries, and they emphasized on the value of demonstrations at the local levels.
- All the countries were in total agreement that there is an urgent need for regional cooperation, setting up of a climate change advisory council, and urged additional support from FAO for mainstreaming of climate change programmes into their economic development plans.

Overall, the delegates were unanimous in their views on climate change – the evidence is compelling and beyond doubt, and that they will need to pool their experiences and insights to develop appropriate policies, laws, infrastructure, finance and incentive-led technologies for adoption by farmers.

### **Session 6 – Group discussions**

The “Dialogue” was followed up with a discussion on the appropriate policies and actions that would be needed to minimize the negative impacts of climate change on food security. The LLDCs and SIDS held discussions as separate working groups, with H.E. Dr. Ty Phommasack, Vice Minister for Agriculture and Forestry of Laos and H.E. O’Love Jacobsen, High Commissioner for Niue in New Zealand, as the moderators, respectively. The SIDS group highlighted concerns on the nutritional aspects of food, especially the consumption of food with high sugar levels and artificial additives. The group followed up with policy issues that focused on making farming an attractive career option, nutrition and food systems and the close link to poverty, reducing overlap among ministries, health issues, and risk management in agriculture. Other issues that fetched some interest included enforcement of regulations to minimize illegal fishing, regional policy framework for strengthening fisheries, and for atoll crops that are more resilient to climate change. Discussions of the LLDC group focused on national level actions for sustainable resource management, awareness raising, community-based disaster risk management, and for creation of enabling policies, laws, institutional setups, finance, and incentive-led technologies for adoption by farmers. Attention was also given for regional and global action in regards to technology transfer, funding, and for capacity building through collaboration and cooperation.

### **Session 7 – Way forward**

In the penultimate, the “Way Forward”, session, the two groups came together to amalgamate the conclusions based on the policies and actions identified during the working groups, and to set out the Forum’s Recommendations. Although the two groups discussed separately the actions and policies, the plenary agreed the conclusions and recommendations would be made jointly for the LLDCs and SIDS. The main conclusions are not exhaustive, and can be grouped into capacity building through regional collaboration, financial and institutional issues, information sharing and networking, and transfer of technology. A strong call was made for developing strategies to support food security at various levels, to be undertaken through demonstration of appropriate technologies with community-based participation. Along with that, the Forum highlighted the need for multi-sectoral approach to develop integrated systems for strengthening resilience and adaptive capacity in the agricultural systems.

With the foregoing discussions, and using the same approach, the delegates deliberated on a set of recommendations that can be undertaken as an immediate follow-up of the Forum. Special emphasis was given to blue growth development in the Pacific Region, and cooperation between the islands in advocating their regional interests. Sustainable management on natural resources on a landscape basis, which acts as the resource base for agricultural production was highlighted. In this context, a strong recommendation was made for water resource management and further strengthening of water conservation technologies. Additional emphasis was given to research and investment for agriculture, including development of livestock production and animal health, and forestry. The Forum also resulted in the recommendation for promotion of climate-smart agriculture, and for FAO to lead international efforts to promote its adoption among the LLDCs and SIDS with a well-defined plan of action. The above aside, the delegates reiterated that the key objectives of the Forum, *viz.* sharing of knowledge and experience on climate change and food security, promotion of successful adaptation and mitigation measures, and development of concrete recommendations and actions have been met satisfactorily. The specific conclusions and recommendations are presented at the start of this report.

### **Session 8 – Closing**

The final, closing session, was the speech by Mr. J. Graziano da Silva, FAO Director General, which was read by Mr. H. Konuma, ADG of FAO Regional Office for Asia and the Pacific. In his speech, the DG highlighted the close link between climate change and food security, and set out how FAO is addressing the issues. Agriculture, livestock and fisheries are dependent on specific climatic conditions, and so past ways of growing crops, raising animals and catching fish cannot continue. The conditions in LLDCs and SIDS are already vulnerable, and climate change can only worsen them. In addition, these agricultural activities are contributing to greenhouse gas emissions. FAO is working on a variety of sustainable solutions that can improve the productivity while reducing green house gas emissions. Adopting management systems that combine adaptation and mitigation is the way forward – it will lead towards improving local and global food security. While FAO works with national governments to include adaptation and mitigation measures in their national programmes, the approach is for identifying and implementing solutions that are site-specific and involving the governments and local communities. The DG thanked the delegates for presenting their priorities, which he pointed out clearly resonated with FAO’s Revised Strategic Framework and Program of Work. He closed the Forum by stating that “We need to work together in order to ensure food security. A food secure country guarantees a food secure world.”

## **Annex 1 – Concept Note**

### **Introduction**

Climate change caused by greenhouse gas emissions has become a defining event in human development issues of our times. The latest Intergovernmental Panel on Climate Change (IPCC 2013) unambiguously attributes climate change to human interventions, and further concludes that the change would be felt more severely in the tropics and subtropics. The impacts of climate change in the Asia-Pacific region have been observed in the past decades, and the projected forecasts for the future include: increase of temperature and rainfall variability across the region; retreat of glaciers and permafrost in snow mountains; decrease of freshwater availability in most of the region; increase of extreme weather events in many countries; and sea water intrusion and flood risks in small island countries and coastal areas.

Although some regions may gain from climate change, in the majority of cases, these perturbations are expected to have severe negative implications on agricultural crop yields and fisheries, leading to strong repercussions on food security. Climate change will affect the different dimensions of food security. With reduction in yields and degradation of arable lands, food production may decline. This will have a cascading effect on stability of food supplies, leading to higher food prices and inaccessible to the poorer households. With increase in malnutrition and decrease in availability of clean water and sanitation, the people would be more vulnerable to diseases. Overall, climate change is likely to make livelihoods of people dependent on climate-sensitive activities highly risky, and could consign them into the vicious cycle of disease and hunger.

### **Why LLDCs and SIDS matter?**

While climate change threatens most countries in the Asia-Pacific region, some are more vulnerable. As is often the case, the Landlocked Developing Countries (LLDCs) (which excepting for Mongolia, also belong to the Least Developed Countries) and Small Island Developing States (SIDS) are worst off compared to the others. The irony of the situation is that LLDCs and SIDS are not big emitters of GHGs, and their contribution to climate change is negligible. Yet the people belonging to these two categories of countries will suffer considerably. To start with, they have fewer resources, socially, technologically and financially, to adapt. Next, their institutional and human capacities are limited to address the challenges of climate change. Furthermore, their economies are not diversified, and dependent on a few primary agricultural and/or mineral commodities. Lastly, the LLDCs and SIDS are geographically disadvantaged. Their physical location in remote and mountainous regions or isolated small islands makes them inherently far more vulnerable to changes in climate. Their inaccessibility adds further difficulties in bringing about development to the regions. Under these circumstances, changing weather patterns, especially floods and droughts, will bring untold misery to millions of people in LLDCs, while the rising sea level, along with other climatic changes will threaten the very survival of many SIDS. It is estimated that globally, some 860 million people in LLDCs and SIDS will be affected, and many among the latter may even become environmental refugees.

Considering LLDCs and SIDS are far more vulnerable to climate change impacts, the Office of the High Representative for the Least Developed Countries, Landlocked Developing Countries and Small Island Developing States (UN-OHRLLS) undertook a special study on

the issue<sup>2</sup>. The study looked into the effects of climate change on LLDCs and SIDS, the environmental and socio-economic implications, and the adaptation strategies under the framework of UNFCCC. Considering these are the most vulnerable countries, although least contributors of Green House Gases, would need additional resources for adaptation and mitigation actions. In specific reference to food security (agriculture and fisheries), the study suggests that as a result of climate change, agricultural production, including access to food, is likely to become severely compromised. The areas suitable for agriculture, the length of the growing seasons, and yield potential are expected to decline. If the situation is allowed to deteriorate, many of these countries will become dependent on external aid, food security will be intensified, and their development goals will be severely affected. In the case of the SIDS, rising sea level will put an end to food production, and mass migrations may be the only option left. Adaptation to climate change is therefore imperative for these countries.

As a follow-up to the above global study, FAO/RAP organized this High-Level Forum. There are five landlocked countries in the Asia-Pacific region, Afghanistan, Bhutan, Lao PDR, Mongolia and Nepal. Excepting for Mongolia, all of rest are either mountainous or have significant mountainous areas and the majority of the population still lives in rural areas and depends on agriculture for their livelihoods. Mongolia consists largely of vast plains, but the population is now largely urban and is classified as a middle income country.

All five countries are vulnerable to climate change. In the least developed countries of Afghanistan, Bhutan, Lao PDR and Nepal, where the majority of the population in each country is still dependent on agriculture, fragile ecosystems and challenges associated with their least developed country status make them particularly vulnerable to the impacts of climate change on food production. Increased variability of rainfall, with more frequent and more severe droughts (or extended dry seasons) and floods put pressure on average yields, as do unpredictable changes in seasonal temperature patterns. Agriculture, forestry, water resources and public health (through changes in disease vectors) will be the most seriously affected sectors. In the case of agriculture, drought most seriously affects rain-fed production, often leading to crop failure, while floods adversely affect both rain-fed and irrigated agriculture. Added to this will be crop losses resulting from more frequent and intense extreme weather events, such as flash floods and storms. In all these cases household food security will be at serious risk. Mongolia, by contrast, is one of the most sparsely populated countries in the world and is classified as a middle income country. Unlike the other four landlocked countries, nearly two-thirds of the population lives in urban areas and no longer depends directly on animal husbandry or agriculture for their livelihoods. Nevertheless, Mongolia's food security is at high risk of being damaged by climate change. The country is prone to natural disasters including *dzud* (harsh winter disaster, such as the one that struck in the winter of 2009-10), forest fires, and floods. Climate change contributes to higher frequency of disasters while response mechanisms are still insufficient. The impact of climate change is exacerbated by the decline in the natural carrying capacity of pastures and of grasslands resulting from the increase in the number of livestock and constant grazing on light and thin soils.

The Pacific Island countries (PICs) because of their unique geophysical features, social, economic and unique cultural characteristics are particularly vulnerable to the effects of global warming, including more frequent and intense natural disasters, such as cyclones, floods and land droughts - as has recently been experienced. The SIDS in the Pacific region

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<sup>2</sup> UN-OHRLLS (2009). The impact of climate change on the development prospects of the least developed countries and small island developing states.

include: Cook Island, Fiji, Kiribati, Marshall Islands, Micronesia, Nauru, Niue, Palau, Papua New Guinea, Samoa, Solomon Islands, Tonga, Timor Leste, Tuvalu and Vanuatu. Maldives from the Indian Ocean is also undergoing similar climate change problems.

Climate change is already affecting Pacific Island countries. Climate variations and extremes have disrupted food production, water supply and economies of PICs. Climate projections for the future although coarse for islands, are bleak and will reduce food security especially at household level. The primary food sources (Agriculture, Fisheries and Forests) and water will all be impacted by climate change and in most cases, these impacts will be negative. The exact magnitude and nature of the climate change impacts on food sources are relatively unknown in PICs.

### **Objectives of Forum**

The overall objective of this Forum is to address food security and poverty reduction in the face of climate change, with special reference to LLDCs and SIDS in the Asia-Pacific region. It attempts to bring to the fore food security threats associated with climate change in the food production and supply environments, as well as the broader livelihood and ecological changes that will occur as a consequence. Recognizing the different geographical regions in the Asia-Pacific region, and how developments in the more developed countries can provide opportunities and understanding for the lesser developed countries, this workshop is aimed at sharing knowledge of the current status of the countries, successful approaches that are in development, and how the countries can implement them with appropriate capacity development, institutional strengthening, and alignment of policies to enable such developments.

Key Objectives of the Forum are to:

- Share and promote knowledge and experience on the impact of climate change on food security in the countries;
- Promote successful climate change adaptation and mitigation interventions for ensuring food security in vulnerable areas;
- Identify effective policy options to minimize negative impacts of climate change and enhance food security; and
- Develop concrete recommendations and actions for climate change adaptation and mitigation for food security following sustainable development and blue and green growth pathways.

Based on those objectives, the expected outputs of the Forum are:

- Participants are able to exchange information on the status and preparedness of countries in their management of the impact of climate change on food security;
- Successful climate change adaptation and mitigation interventions for ensuring food security identified and discussed;
- Effective policy options and actions that would be taken to minimize the negative impacts of climate change and enhance food security identified and agreed;
- Key recommendations to reduce the negative impacts of climate change on food security in LLDCs and SIDS in Asia and the Pacific Region discussed and agreed; and
- A report summarizing the presentations and discussions at the Forum including conclusions and recommendations (elaborated after the Forum).

**Date and Venue**

The one-day event is on 12<sup>th</sup> March 2014, starting from 08.30 till 15.30h, back-to-back with the 32<sup>nd</sup> Session of the FAO Regional Conference for Asia and the Pacific, in Ulaanbaatar, Mongolia. The Forum will be held at the Conference Room of the Ministry of Industry and Agriculture of Mongolia.

**Participants**

The expected 30 participants will include senior ministry officials from the LLDCs and SIDS of the Asia-Pacific Region, other UN and International Agencies, regionally based development partners, non-governmental organizations.

**Forum Agenda**

The agenda of the workshop (included below) is designed to engage participants in interactive discussions and to solicit their advice on the identifying the impacts of climate change on food security, and to recommend policies and strategic options.

**Contact Details**

For detailed information regarding the workshop, please contact:

FAO: Simmathiri Appanah ([Simmathiri.Appanah@fao.org](mailto:Simmathiri.Appanah@fao.org))

## Annex 2 - Programme

### PROGRAMME

**High-Level Forum on  
“Climate Change and Food Security in the Landlocked Developing Countries  
and Small Island Developing States in Asia and the Pacific Region”  
Conference Hall, Ministry of Industry and Agriculture, Mongolia, Ulaanbaatar**

**Wednesday 12<sup>th</sup> March 2014**

- |               |                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 08.00 – 08.30 | Registration and welcome coffee                                                                                                                                                                                                                                                                                                                                                                                                              |
| 08.30 – 08.50 | <b>Opening Session</b><br>Welcome speech by Mr. Hiroyuki Konuma, FAO Assistant Director-General and Regional Representative for Asia and the Pacific<br><br>Opening speech by H.E. Mr. Khaltmaa Battulga, Minister of Industry and Agriculture, Mongolia                                                                                                                                                                                     |
| 08.50– 09.00  | <b>Setting the scene</b><br>Background, structure of the forum, and introductions<br>( <i>Simmathiri Appanah, FAO</i> )                                                                                                                                                                                                                                                                                                                      |
| 09.00 – 09.20 | <b>Keynote Address (1): The impact of climate change on the development prospects of Landlocked Developing Countries and Small Island Developing States</b><br>( <i>Presentation by Mr. Erdenebileg Sandagdorj, Chief of Policy Development, Coordination and Reporting Service, UN Office for the High Representative for the Least Developed Countries, Landlocked Developing Countries and Small Island Developing States, New York</i> ) |
| 09.20 – 09.40 | <b>Keynote Address (2): Impact of climate change on food security: Asia Pacific perspectives</b><br>( <i>Presentation by Dr. Masa Iwanaga, Member of the High-Level Panel of Experts [HLPE] of CFS and President of JIRCAS</i> )                                                                                                                                                                                                             |
| 09.40 – 10.00 | Coffee break and group photo                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 10.00 – 10.10 | <b>Introduction of Climate-smart agriculture at FAO</b> ( <i>Presentation by Ms. Wiryia Khim, JPO – Natural Resource Management, FAO Regional Office for Asia and the Pacific</i> )                                                                                                                                                                                                                                                          |
| 10.10 – 12.00 | <b>Heads of Agriculture Dialogue: Countries share experiences on impact of climate change on food security and interventions for adaptation and mitigation</b><br>Government Representatives from LLDCs and SIDS<br>( <i>Interactive interviews/Panel discussion</i> )                                                                                                                                                                       |
| 12.00 – 13.00 | Lunch                                                                                                                                                                                                                                                                                                                                                                                                                                        |

- 13.00 – 14.00 **Effective policy options and actions to minimize negative impacts of climate change and enhance food security**  
*(Group discussion)*
- 14.00 – 15.00 **Way forward: Recommendations and actions for climate change adaptation and mitigation for food security**  
*(Plenary discussion)*
- 15.00 – 15.30 **Closing Session**
- Closing Speech by Dr. José Graziano da Silva, Director-General, FAO

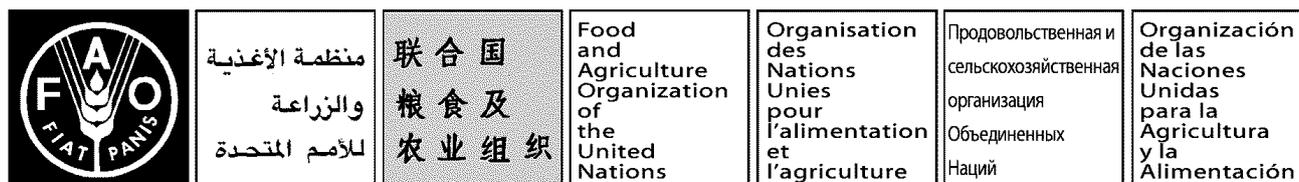
Annex 3 – List of participants

**List of Participants**  
**High-Level Forum on “Climate Change and Food Security in**  
**The Landlocked Developing Countries and Small Island Developing**  
**States in Asia and the Pacific Region”**  
**Ulaanbaatar, Mongolia, 12 March 2014**

No	Country	Name	Title
<b>Landlocked Developing Countries</b>			
1	<b>Afghanistan</b>	H.E. Mir. Amanuddin Haidari	Deputy Minister for Agriculture Affairs
2	<b>Bhutan</b>	Mr. Sherub Gyaltshen	Secretary for Agriculture and Forests
3	<b>Laos</b>	H.E. Dr. Ty Phommassack	Vice Minister for Agriculture & Forestry
4		Mr. Sousath Sayakoummane	Deputy Permanent Secretary, MAF
5		Mr. Bounkhong Khambounheuang	Director General of Department of Livestock and Fishery, MAF
6	<b>Mongolia</b>	H.E. Mr. Khaltmaa Battulga	Minister, Ministry of Industry and Agriculture (MoIA)
7		Mr. Erdenetsogt Odbayar (Moderator)	Interim Director, International Think Tank for Landlocked Developing Countries
8		Ms. Ts. Battsetseg	Officer-in-Charge for Food Security, Ministry of Environment and Green Development
9		Ms. B. Udonbor	Officer in Charge for CAC, MoIA
10		Mr. Enkhtuvshin	World Labor Academia
11		Ms. U. Tuul	Sustainable Development Center
12		Ms. T. Erdenejargal	Ministry of Industry and Agriculture (MoIA)
13		Ms. Khaliunaa Enkhbold	MoIA
14		Ms. Yanjmaa	MoIA
15		Mr. Bindariya	MoIA
16		Ms. B. Delgermaa	Liaison Officer
17		Mr. M. Byambadorj	Liaison Officer
18		Ms. Ts Orkhon	Liaison Officer
19		Mr. D. Khurelbayar	Liaison Officer
20	<b>Nepal</b>	Dr. Pathak Prabhakar	Joint Secretary, Food Security and Environment Division, Ministry of Agriculture Development
<b>Small Island Developing States</b>			
21	<b>Cook Islands</b>	Dr. Teariki Matairangi Purea	Secretary for Ministry of Agriculture Cook Islands
22	<b>Fiji</b>	H.E. Inia Batikoto Seruiratu	Minister for Agriculture, Fisheries & Forests
23	<b>Kiribati</b>	Hon. Tiarite George Kwong	Minister for Environment, Lands and Agricultural Development

24		Ms. Bwebwe Tuare	The Senior Project Officer member of delegation
25		Mr. Tokintekai Bakineti	The Principal Agricultural Officer
26	<b>Maldives</b>	Mr. Mohamed Shareef	Deputy Minister for Fisheries and Agriculture
27	<b>Marshall Islands</b>	Hon. Michael Konelios	Minister for Resources and Development
28		Mr. Henry Capelle	Chief of Agriculture and Quarantine
29	<b>Micronesia</b>	H.E. Akillino H. Susaia	FSM Ambassador Extraordinary and Plenipotentiary to China
30	<b>Nauru</b>	Mr. Calistus Cain	Acting Director of Commerce and Business Development
31	<b>Niue</b>	H.E. O'Love Jacobsen	High Commissioner for Niue in New Zealand
32	<b>Papua New Guinea</b>	Hon. Tomscoll Assik Tommy Jordan	Minister for Agriculture and Livestock
33		Mr. Brown Konabe	Director of the Food Security Branch
34	<b>Samoa</b>	Hon. Le Mamea Ropati Mualia	Minister for Agriculture and Fisheries
35		Mr. Leota Pelesa	Assistant CEO, Animal Production and Health Division
36		Mrs. Elisa Le Mamea Mualia	Minister's Good Lady
37	<b>Timor Leste</b>	Mr. Marcos Da Cruz	Vice Minister of Agriculture
38		Mr. Gil Da Cruz	National Director
39		Ms. Angela Lopes Da Cruz	Minister's Good Lady
40	<b>Tokelau</b>	Hon. Kuresa Nasau	Minister for Natural Resources and Environment
41		Mr. Mika Perez	Director of Economic Development. Natural Resources
42	<b>Tonga</b>	Hon. Sione Sangster Saulala	Minister for Agriculture and Food, Forests and Fisheries
43		Mrs. Losaline Ma'asi	Chief Executive Officer
44	<b>Tuvalu</b>	Hon. Elisala Pita	Minister for Agriculture
45		Mr. Itaia Lausaveve	Director of Agriculture
46		Mr. Falasese Tupau	Assistant Secretary
47	<b>Vanuatu</b>	Hon. Minister David Tosul Butulso	Minister for Agriculture, Livestock, Forestry, Fisheries and Biosecurity
48		Mr. Derek French	First Advisor
<b>Observers</b>			
49	<b>Australia</b>	Mr. Matthew Worrell	Minister Counselor and Australia's Deputy Permanent Representative to the FAO in Rome.
50	<b>Cambodia</b>	H.E. Dr. Mam Annot	Secretary of State, Ministry for Agriculture, Forestry and Fisheries
51		Dr. Ker Monthivuth	Director of the Department of Administration, Planning, Accounting and International Cooperation
52		Dr. Sar Chetra	Deputy Director, Department of Animal Health and Production, Ministry for Agriculture, Forestry and Fisheries

53		Mr. Chheng Vibolrith	Deputy Director, Department of International Cooperation, Ministry for Agriculture, Forestry and Fisheries
54	<b>Japan</b>	Mr. Yuichi Nishida	Deputy Director, Ministry of Agriculture, Forestry and Fisheries
55	<b>New Zealand</b>	Mr. R. Rajasekar	Senior Programme Manager, Ministry for Primary Industries
56	<b>Republic of Korea</b>	Mr. Ji Wan YOON	Deputy Director, Department of International Cooperation, Korea FAO Association
57		Mr. Hyeong Tae KIM	Assistant Manager, Department of International Cooperation, Korea FAO Association
58	<b>Thailand</b>	Ms. Narumol Sanguanvong	Director of Bureau of Agriculture Foreign Affairs, Ministry of Agriculture and Cooperatives
<b>Associates</b>			
59	<b>Keynote speakers</b>	Mr. Sandagdorj Erdenebileg	Chief of Policy Development, Coordination and Reporting Service
60		Dr. Masaru Iwanaga	President of JIRCAS
61	<b>Press</b>	Mr. Stian Reckler	Reuters
62	<b>FAO</b>	Mr. Hiroyuki Konuma	ADG/RR, FAO RAP
63		Mr. Gavin Wall	Sub-regional Representative for the Pacific Islands and FAO Representative
64		Mr. Sheikh Ahaduzzaman	FAO Representative, Mongolia
65		Mr. Allan Dow	Information Officer, FAO RAP
66		Mr. Simmathiri Appanah	Climate Change and Bioenergy Officer (Acting), FAO RAP
67		Ms. Wiryia Khim	JPO, Natural Resources Management, FAO RAP
68		Mr. Naoki Minamiguchi	Senior Food Security Consultant, FAO RAP
69		Ms. Erdene UsAdiya	Operations Assistant, FAO Mongolia
70		Ms. Uyanga Bold	Accountant, FAO Mongolia



## Welcome Remarks

by

**Hiroyuki Konuma**

Assistant Director-General and  
Regional Representative for Asia and the Pacific

### High-Level Forum “Climate Change and Food Security in the Landlocked Developing Countries and Small Island Developing States in Asia and the Pacific Region”

March 12, 2014

Hon. Ministers, Excellencies, Ladies and Gentlemen,

It is a great honour for me to welcome you all to this very important Forum on “*Climate Change and Food Security in the Landlocked Developing Countries and Small Island Developing States in Asia and the Pacific Region*”. Before I begin, I would like to take this opportunity to thank the Honourable Minister of Agriculture, Mr. Khaltmaa Battulga for agreeing to host this event in this great country. By the same token, I wish to extend my thanks to each and every one of you here for dedicating your precious time to what I anticipate will be a timely, valuable and practical event.

As all here will readily acknowledge, climate change caused by greenhouse gas emissions has become a defining human development issue of our times. It threatens our existence, our choices of lifestyles, and indeed our very freedom. While climate change affects all, it does not do so equally. Nor is our capacity to respond to its challenges at the same level. As is frequently the case, the most vulnerable countries – the Landlocked Developing Countries and Small Island Developing States – find themselves in the worst possible situation. The irony of it all is the LLDCs and SIDS have contributed least to the problems of climate change facing the entire globe. But these are the countries that are facing major disruptions to their economic growth, health status, and the environment. It is frightening to think of some of the forecasts made by the Intergovernmental Panel on Climate Change (IPCC): the Panel concluded that a global temperature increase of 4 degrees Centigrade would completely drown out low-lying island states such as Tuvalu, Kiribati, and the Maldives. Many of the LDCs in Asia are expected to face complete disruptions in the weather patterns, and increased frequencies of floods and droughts. According to IPCC, the worst consequences may not be felt until 2050, but countries are already beginning to witness the adverse impacts of climate change on agricultural production and food security. Such extremes in weather patterns will expose millions of people in LDCs to poverty, hunger and disease. Next, the rising sea level, along with other climatic disruptions, threatens the very survival of the SIDS. In fact SIDS could physically disappear, and the populations will become environmental refugees. These dire predictions demand serious attention, and it is time we act.

With the aforesaid in focus, the United Nations has opened a special office to look after the concerns of LDCs and SIDS. I am very pleased to announce that UN-OHRLLS' Chief of Policy, Mr. Sandagdorj Erdenebileg is here with us to share the thoughts of Mr. Gyan Chandra Acharya, Under-Secretary General and High Representative, on how the UN is endeavouring to address your needs. I am equally pleased to inform you all that we also have with us Dr. Masaru Iwanaga, the President of JIRCAS, who will address us on climate change and food security from his vast knowledge and experience.

FAO, together with several other agencies, has been working on eradicating hunger and malnutrition globally. This Forum would give special attention to the impact of climate change on food security with respect to LDCs and SIDS. While this Forum represents only a small step, yet it portends to hold a huge potential for further development. FAO's attention is not merely confined to agricultural productivity but the multiple dimensions of food security. It concerns food availability, economic and physical access to food, nutrition, and stability. It wouldn't do if we concentrate on agricultural productivity but neglect access to food. This fits in with FAO's campaign to eradicate hunger worldwide.

In this respect, I wish to highlight the new FAO initiative, which we have labeled "Climate-Smart Agriculture" (CSA). This concept has the potential to generate the momentum to optimize and transform agricultural systems to sustainably and equitably produce more while adapting to climate change. CSA is also context specific, and gives the farmers a free hand in developing appropriate interventions which are tailored to meet their needs and specific environmental, social and economic needs. FAO is looking into creating a global mechanism to bring the technical, policy and financial support for countries to adopt the CSA approach.

It would be pertinent to bring to your attention that Articles 4.8 and 4.9 of the United Nations Framework Convention on Climate Change (UNFCCC), LDCs and SIDS are recognized to be most vulnerable to the adverse effects of climate change, and the Convention particularly requires that "Parties shall take full account of the specific needs and special situations of the least developed countries in their actions with regard to funding and transfer of technology". This Forum shall be the platform to lobby for more attention and support for our special needs.

What can we achieve at this Forum? I can perhaps make the point more trenchantly by departing from the usual opening remarks. So imagine that you live in an isolated village in Lao PDR. Your family has been tending the plot of land for generations. It's been tough all along. But recently difficulties have compounded – the weather has become erratic, rainfall less predictable, crop yields tentative, and prices unstable. Now, let us imagine such a scenario persisting into the next decade, and further, with more droughts, more floods, more heat, and your food needs precariously on the line. How will your family survive? Will the whole village even exist? It is that poor farmer's life that we are discussing at this Forum. I cannot imagine a more important meeting on a more crucial issue at the most critical time. So, this is our challenge today – how we can move forward an agenda that will enhance food security, and improve the lives of millions of rural folks who today exist in appalling poverty.

This Forum has set aside a special session, the "Heads of Agriculture Dialogue" where all the countries would have the opportunity to voice out their needs, individually and collectively. That poor villager in Lao PDR should be in our sight when we discuss what are the issues, and how shall we address them. In the past, development agencies were inclined to view at

climate change, food security and the issues of poverty in isolation. Instead, we should discuss them and their inter-linkages for bringing about meaningful and practical solutions.

- We all know that 60% of the population in Asia-Pacific resides in the rural areas.
- We also know we will have to increase food production by 60% by 2050 to feed the expected 9 billion people.
- And we know that agriculture, forestry and land use change contributes about 30% of greenhouse gas emissions.

All the above statistics would have to be taken into our discussion – we need to feed the world while simultaneously mitigating climate change. So, at this Forum we will need to search for the triple solutions: first with policies and programmes to enhance agricultural productivity and rural incomes; second, to develop agricultural systems that are more resilient to climate change, and third for agriculture to be a part of the solution to climate change and not its problem. It is not a daunting task. Many countries in the Asia-Pacific region are already implementing excellent programmes for achieving such a triple-win solution.

Your Excellencies, Ladies and Gentleman,

Let's use this unprecedented gathering of Ministers and Senior Officials to pave the path for a more resilient agriculture system with a lower carbon footprint. And FAO will be your strongest partner in this endeavour.

Thank You.

**Welcome Remarks**

**by**

**H.E. Mr. Khaltmaa Battulga**

Minister of Industry and Agriculture of Mongolia

**High-Level Forum “Climate Change and Food Security in the Landlocked Developing Countries and Small Island Developing States in Asia and the Pacific Region”**

March 12, 2014

Excellency, Director General of United Nations Food and Agriculture Organization  
Mr. Hiroyuki Konuma,  
Honorable Ministers,  
Ladies and Gentlemen,

Good morning. I am pleased to participate and honored to give a speech to the opening Forum of “Climate change and Food Security” summit from the Asia-Pacific Landlocked Developing Countries and Small Island Developing States.

It is special that this Forum is being held during the 32<sup>nd</sup> United Nations Food and Agriculture Organization Regional Conference in Ulaanbaatar.

Today’s Forum is both of great importance and well-timed because while all countries worldwide are facing difficulties with climate change, it is the landlocked countries and small island states which are experiencing the greater negative impacts from climate change.

Exchanging information and sharing knowledge and experience is very important in order to implement effective policies to adapt to climate change, to limit its damage and negative influence and in so doing to ensure food security.

As a country with an arid climate, Mongolia is facing huge negative impacts with average climate temperature increasing by 2.1°C over the last 70 years, and precipitation decreasing by 7% along with accelerated desertification, melting glaciers, deteriorating grazing capacity and evaporating lakes and rivers.

Additionally, as a country bordering two neighbors, remote from the world market and with high freight costs, we face many challenges and barriers not only on economic development but also on trading with different countries, especially on providing safe quality food imports.

Mongolia shares these challenge with other landlocked countries, and accordingly the State of Mongolia has collaborated with other landlocked developing countries within the framework of the UN and has played a leading role since 2009 on the initiative of “International Research Center for the Landlocked Developing Countries” by donating 540 million tugrugs for their operation.

I would like to express my appreciation to the UN Food and Agriculture Organization Asia and the Pacific Regional team for organizing the Forum, and to the International Research Center for the Landlocked Developing Countries for the support in the preparation.

Today's Forum will focus on climate change and food safety and will be sure to address this issues with a good outcome.

I have no doubt that today’s Forum will be very successful and I am sure that through our cooperation, we can find useful solutions and ways to solve the difficulties faced in providing food security.

Thank you for the attention.



**Climate Change & Food Security in the LLDCs and SIDS  
In Asia and the Pacific Region  
Ulaanbaatar, Mongolia 12 March 2014**

Keynote Address

**The Impact of Climate Change on the Development Prospects of the LLDCs and SIDS  
Mr. Sandagdorj Erdenebileg - Chief of Policy Development, Coordination and  
Reporting Services United Nations – OHRLLS, New York**

I wish to thank the organizers for the opportunity to speak at this important gathering. Climate change and food security are of great concern to the international community, especially in the Landlocked Developing Countries (LLDCs) and Small Island Developing States (SIDS) which are groups of countries in which large populations remain vulnerable to the effects of adverse weather patterns, including declining agricultural productivity. I speak on behalf of the United Nations Office for the Least Developed Countries, Landlocked Developing Countries, and Small Island Developing States (UN-OHRLLS), an office that was established to undertake advocacy work in support of the most vulnerable countries, in partnership with the relevant parts of the United Nations as well as with the civil society, media, academia and foundations.

This meeting is very important considering that millions of people in the LLDCs and SIDS are vulnerable to climate change as a result of depleting glaciers, increasing coastal erosion, frequent floods, droughts, and periods of higher temperatures associated with global warming. Large swathes of the population remain vulnerable to the destructive forces of tropical monsoons. In addition, high population density, high dependency of agriculture on monsoons, and the extreme poverty add to the challenges. Densely populated low-lying areas of mega deltas are at severe risk to sea level rise. In terms of food security, Asian countries were so greatly alarmed by the huge increases in the price of rice during the 2007-08 food price crises. This is because rice and wheat are the staple food of most of Asia and majority of Asia's poor people spend a large portion of their incomes on these two commodities. In addition, global market for rice is particularly thin, making international price volatility more pronounced than for most other staple foods.

**Part I: Introduction to the LLDCs**

There are 31 countries on four continents that the United Nations recognizes as Landlocked Developing Countries (LLDCs). These countries share common handicaps which include geographical remoteness; dependence on transport systems in neighbouring countries, diminished competitiveness on international markets and predominantly natural resource-based economies with a limited export base. LLDCs are beset by daunting economic

challenges affecting growth and development. Taken together, LLDCs are among the poorest developing countries - 16 of them are classified as least developed. Socio-economic indicators such as life expectancy, economic growth rate and gross domestic product (GDP) per capita show that LLDCs have fared badly compared to transit neighbours. LLDCs' share of world trade remains small, about 1.2 percent. In 2010, trade volume of the LLDCs was just 61 percent that of coastal economies.

Transport costs for LLDCs are typically higher than for their transit neighbours and continue to rise. In 2010, they were 45 percent higher than representative coastal economies. And due to landlockedness, the level of development in a typical landlocked developing country is about 20 percent lower than what it would be, if the country were non-landlocked. As you will later see, LLDCs are also greatly impacted by climate change.

## **Part II: LLDCs, Climate Change and Food Security**

LLDCs are among countries severely affected by climate change because they have fewer resources to adapt: socially, technologically and financially. Due to a number of factors, the economies of the LLDCs are highly vulnerable to climate change, desertification and land degradation. First, most LLDCs lack institutional and human capacity to tackle these challenges; second, many are too dependent on climate-sensitive resources (e.g. agriculture, livestock, forestry, water, fisheries); third, most LLDCs command non-diversified economies which are dependent on a few primary agricultural and/or mineral commodities and finally, many LLDCs are located in dryland regions where the impact of climate change, desertification and land degradation are more pronounced. It is for these conditions that world leaders stressed in the Outcome Document of the Rio+20 Conference that desertification, land degradation, and drought are challenges of a global dimension, and continue to pose serious challenges to the sustainable development of all countries, in particular LLDCs.

Allow me now to briefly discuss how climate change has impacted LLDCs, followed by their food security concerns.

## **Part III: Climate Change and the LLDCs**

Drylands cover nearly 40 percent of the earth surface, 72 percent of which are in developing countries. Landlocked developing countries alone account for 60 percent of the total drylands worldwide. Of the 29 countries where at least 20 percent of the population lives on degraded lands, 14 are LLDCs. In fact, LLDCs account for more than 70 percent of proportion of the populations living on degraded lands in the world. In addition, the rate of deforestation is alarmingly high, given that nearly 70 percent of the 400 million people living in LLDCs are rural based, and rely heavily on the land resources for their livelihood. LLDCs are located in ecologically sensitive areas. In Africa, the Sahara desert impacts countries such as Chad, Burkina Faso, Ethiopia, Mali, and Niger. LLDCs in Southern Africa, such as Botswana, Zambia, Lesotho, and Zimbabwe are near the Kalahari. In Asia, Kazakhstan, Kyrgyzstan, Mongolia, Tajikistan and Uzbekistan are impacted by several dryland regions and deserts, including Gobi and Kyzyl-Kum Deserts.

Let me now discuss a few country experiences, starting with the host country, Mongolia.

According to the United Nations Convention for Combating Desertification, approximately 70 percent of Mongolia is under the threat of desertification and land degradation. Five percent of Mongolia is currently severely affected by desert while 18 percent is heavily affected by desertification. A further 49 percent is lightly to moderately impacted by desertification. Average temperatures for Mongolia in the last 100 years are estimated to have increased by 1.66 degrees Celsius. This is more than the global temperature rise of between 0.5 and 0.6 degrees Celsius. Desertification is further reinforced by unsustainable land use patterns, including large herds of livestock and rapid expansion of the extractive industry.

Located in dry regions where hyper-arid, semi-arid and arid conditions prevail, LLDCs are the most water stressed countries in the world. Some studies indicate that freshwater availability in drylands is projected to decrease further from the current overall average of 1,300 cubic meters per person per year. It is important to underscore here that the lowest threshold of 2,000 cubic meters is set for human well-being and sustainable development. Let me now consider the explicit climate change impact on the food security in the LLDCs.

Climate change impact in Mongolia is evident. Despite intentions at the start of the 2013 farming season to increase wheat-growing land, below-average rains from March to mid-June, reduced plantings to 276, 000 hectares, some 7 percent below area sown in 2012. Furthermore, excessive rains from July to August and hail in early August reduced yields in wheat producing areas, such as Arkhangai and Bulgan. As a consequence, last year's wheat production was officially estimated to be 20 percent below the 2012 record level.

Manmade causes have contributed to environmental degradation elsewhere in the region. For instance, irrigation systems have resulted in increasing soil salinity across Central Asia. As can be seen from the following table, soil salinity, and soil erosion affects all Central Asian Landlocked developing countries. Soil salinity is a severe problem in Turkmenistan where more than 90 percent of the irrigated area is affected. Soil erosion is also a severe problem in Kyrgyzstan and Tajikistan where more than 25 percent of the area is affected.

Country	Salinity ( % of area affected)	Erosion ( % of area affected)	% of irrigated area (affected by salinity)
Kazakhstan	7.9	2.8	33.0
Kyrgyzstan	0.5	28.2	11.5
Tajikistan	4.9	25.9	16.0
Turkmenistan	14.9	1.4	95.9
Uzbekistan	14.1	2.9	50.1
Central Asia	9.0	4.8	47.5

Source: IFPRI 2008

Additionally, soil fertility is low and declining in many irrigated parts of Central Asia. The Central Asian Countries Initiative for Land Management estimates that: (i) for the past decade, Uzbekistan has experienced sharp declines in cotton yields because soil organic matter has declined by 30 to 40 percent; (ii) close to 60 percent of arable land in Kyrgyzstan is seriously affected by water and wind erosion including most rain-fed cultivated areas; (iii) rain-fed crop cultivation in Tajikistan occurs on slopes of up to 25 percent without conservation measures; (iv) almost 80 percent of Uzbekistan comprise of deserts and semi-

deserts, including the Kyzyl-Kum, the largest desert of Central Asia; (v) more than 52 percent of Uzbek's arable lands and 73 percent of grasslands are presently undergoing degradation.

#### **Part IV: LLDC and Food Security**

The International Food Policy Research Institute, a reputable agricultural research and policy center based in Washington D.C., observes that around the world, one out of 8 individuals go to bed hungry every day. Food security situation is particularly bad for nineteen countries which suffer from levels of hunger described as either "alarming" or "extremely alarming" on the Global Hunger Index. LLDCs such as Burkina Faso, Burundi, Central African Republic, Chad, Ethiopia and Zambia are among the countries experiencing "alarming" or "extremely alarming" hunger situation

Climate change has disproportionate and profound effects on the economies of the LLDCs. There are several reasons as to why climate change threatens food security for many of the LLDCs. Because:

- LLDC economies are largely agro-based, characterized by limited productive capacities and concentrated on one or a few bulky primary agricultural and mining commodities.
- As already noted, LLDCs are geographically disadvantaged (landlocked and drylands) and are further characterized by a lack of human, institutional, capital and financial resources to deal effectively with climate change, desertification and land degradation.
- Many of the LLDCs are net importers of major cereal crops (wheat, rice, maize). Food and fossil fuel price hikes translate into severe shocks that hurt their economies.
- LLDCs have large poor and vulnerable populations - people with few assets and low income earning potential. They include smallholders and landless people in the countryside and marginalized ethnic and Indigenous

#### **Food Security in Asian LLDCs**

Food insecurity in Central Asia is dire, and populations in this region are severely impacted by fluctuations in food prices. In this region, more than 5 million people out of a combined population of 62 million have no access to staple food products. For the LLDCs of Central Asia, the primary concern is the relatively high level of poverty in Tajikistan where it stands at 47.2 percent,) and in Kyrgyzstan where it is at 31.7 percent.

According to FAO, Tajikistan is only able to cover 31 percent of its food consumption needs, while Kyrgyzstan, Uzbekistan, and Turkmenistan cover around 50 percent of theirs; the share of household income devoted to food remains very high. It is 80 percent in Uzbekistan and around 58 percent for Tajikistan and Kyrgyzstan, and as much as 42 percent in Kazakhstan. In the developed countries, households spent around 15-30 percent of their incomes on food.

The 2007/08 National Risk and Vulnerability Assessment in Afghanistan found that nearly a third of the population were unable to get enough food. Another 37 percent (8.5 million) were on the borderline of food insecurity. Each year, nearly 400,000 people are seriously affected by natural disasters such as droughts, floods, earthquakes, or other extreme weather conditions. In Kazakhstan, a combination of factors, including declining soil fertility, drought, and poor quality of seeds, caused wheat production to fall from 3,000 kg per hectare in 2011 to 800 in 2012. Since 2001, land under wheat cultivation has increased by almost 42 percent yet wheat yield has declined by 30 percent over the same period.

Countries in South Asia face serious food security just like their Central Asian counterparts. For example, in Nepal, the agricultural sector is the largest employer and a major source of livelihood, especially for the rural poor. The sector employs more than 65 percent of the total population, and it accounts for around 33 percent of the country's GDP. However, recurring climate change-related events such as flash floods, landslides, intense rains, droughts, hailstorms, cold and heat waves, soil erosion and mass movements have generated significant and growing challenges.

In Bhutan, rising food prices are a major cause of concern since domestic production of total cereals is only able to meet about 60 percent of the total cereal demand. FAO reports that food insecurity in Laos affects more than 10 percent of households, with additional 50 percent being at risk of food insecurity should late or erratic rainfalls, floods or agricultural pests affect them. In Nepal, declining agricultural production has depressed rural economies and increased widespread hunger and urban migration. Almost 50 percent of the population is undernourished, and nearly half of all children under 5 are chronically malnourished. Chronic malnutrition has debilitating effects, such as blindness, brain damage, and infectious diseases, which often can result in lifetime damage.

Please allow me now to briefly highlight the climate change and food security problems that confront a second group of countries – the Small Island Developing States (SIDS).

### **Part V: Climate Change, Food Security and the SIDS**

OHRLLS has the most comprehensive list of SIDS consisting of 38 UN Member States and 19 Non UN Members which are members of regional commissions. For the most part, SIDS confront similar challenges in achieving sustainable development given their small markets and narrow resource base, meaning that they cannot benefit from economies of scale. They are also great distances from major markets and face high costs for energy, infrastructure, transportation, communications and servicing. Amongst the greatest concern for these countries are the constant threats from climate change, including sea-level rise. Many SIDS have little or no resilience to natural disasters from which they remain extremely vulnerable.

Collectively, SIDS contribute less than 1 percent to global greenhouse gas emissions, however they bear the greatest burden to the multiple impacts of climate change. For instance, according to the 2013 Global Assessment Report by the United Nations Office for Disaster Risk Reduction, in the case of a one-in-250 year cyclone, the top 10 countries in terms of losses in relation to the value of urban produced capital are all islands, 6 of which are SIDS. Given their small size, individual hazard events like cyclones may affect an entire territory and economy. Disasters can potentially destroy decades of capital investment and hard-fought development gains, often followed by slow and costly recovery.

To illustrate the impact of climate change on the SIDS, and their inability to cope, cyclone Ivan of 2004 resulted in damages estimated at US\$900 million in Grenada. This was more than twice that island's GDP. And Cyclone Evan that hit the South Pacific in 2012 resulted in total losses equivalent to one third of Samoa's annual economic output.

SIDS face serious threats pertaining to sea-level rise, saline intrusion into freshwater aquifers, ocean acidification, coastal erosion, increased frequency of devastating cyclones and resulting economic and social shocks will inevitably be felt more and more by the rest of the international community as the impacts of climate change continue to grow.

But the SIDS deserve global attention for they contain some of the most diverse ecosystems in the world, making them very sensitive to climate change. While being just 3 percent of the earth's surface, they are home to some 20 percent of all plant, bird, and reptile species in the world. The Secretariat of the Convention on Biological Diversity states that 95 percent of bird, 90 percent of reptile, 69 percent of mammal, and 68 percent of plant extinctions have occurred there.

Clear warnings regarding climate change impact on the SIDS continue to be sounded. For example, the World Bank through its 2012 report, *Turn Down the Heat*, warns that if current commitments and pledges are not fully realised, a warming of 4°C could occur as early as the 2060s. Such warming and associated sea-level rise of 0.5 to 1 meter or more by 2100, will see a tipping point leading to further warming of 6°C and sea-level rise in the proceeding centuries. A similarly warning is found in UNEP's 2012 *Third Emissions Gap Report* which warns that to stay below the 2°C limit which has been called for by SIDS, global emissions will need to peak before 2020 and then drop sharply thereafter. In these scenarios, SIDS will be severely affected especially given that these groups of countries continue to stress the dire consequences of exceeding 1.5 °C to prevent serious threats to their development and in some cases, survival.

An important lens through which to view climate change and indeed food security for SIDS is from the perspective of the oceans. While oceanic systems have a major impact on the entire planet, SIDS, perhaps more than any other group of countries, have a high interaction with the oceans. On average, almost 30 percent of SIDS population lives in the zone less than 5 meters above sea level. The populations of the Marshall Islands and Tuvalu live entirely within this 5 meter zone. In the case of the Maldives, the extremely low elevation of the coral islands that make up the country, places residents and their livelihoods under threat from climate change and sea-level rise. The highest land point is only 2.4 metres above sea level, while more than 80% of the total land area is less than 1 metre above sea level. Some 42% of the population and 47% of housing structures are within 100 metres from the coastline, placing them under severe threat from inundation.

Pacific SIDS are stewards of vast ocean areas and globally important fisheries. According to the Food and Agricultural Organisation, most catches of the principal market tuna species consumed in the world are taken from the Pacific, amounting to 70.5% of the total catch of principal market tuna species in 2008. But many Pacific SIDS have already begun to experience the impacts of climate change on food security.

In Fiji, sea level rise and flash floods are already affecting low-lying farms and coastal communities and is having a direct impact on food and cash crops, threatening food security and affecting the economy. In Palau, sea level rise and saltwater intrusion means the soils are more saline in coastal growing areas, making it difficult to grow food crops. Increasing sea surface temperature is also having a negative impact on important food species. In Papua New Guinea focus is being placed on the issue of drought, which has caused major food shortages in recent years in parts of the country. The Marshall Islands, any reduction in rainfall is likely to put the nation at a high risk of drought. A period of two to three weeks of no rainfall can cause serious water shortages, for the people of Funafuti in Tuvalu who depend heavily on rainfall to supply all their water needs.

When considering the costs of adaptation to climate change, it is crucial that SIDS continue to receive ample assistance from funds set up on the basis of tackling climate change, and likewise SIDS should pursue these sources of finance vigorously. In particular, the Green

Climate Fund will be operational in 2014 and should contribute towards the ultimate objectives of shifting towards low-emissions and climate resilient development in SIDS. Likewise, the Global Partnership for Oceans launched by the World Bank in 2012 aims to raise US\$1.5 billion for the world's oceans and is committed to mobilize at least US\$300 million in catalytic finance.

The 2013 *Report of the Secretary-General on Oceans and the Law of the Sea* identified the strong need for capacity building with regard to ocean acidification and in view of the scientific and technical complexities of this problem, both policymaking and policy adoption and implementation can prove very challenging for developing countries, in particular SIDS. Ocean acidity has increased by 26% since the beginning of the industrial revolution and the rate of acidification is expected to accelerate in the coming decades in any 'business as usual' scenario for CO<sub>2</sub> emissions.

## **Part VI: Pathways to Food Security in the LLDCs and SIDS**

With food security under threat from climate change, the agricultural sector provides compelling opportunities to adapt proactively to maintain food production and secure farmers' livelihoods, while also reducing greenhouse gas emissions. There is a lot of ongoing work in this area. Unfortunately time may not permit to offer a comprehensive review of all the processes.

Here are a few policy recommendations that can improve food security in the LLDCs and SIDS:

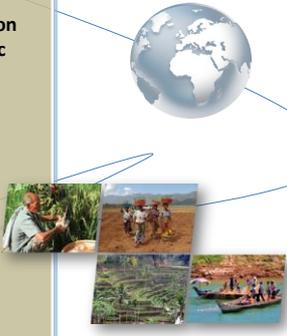
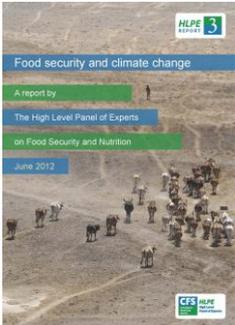
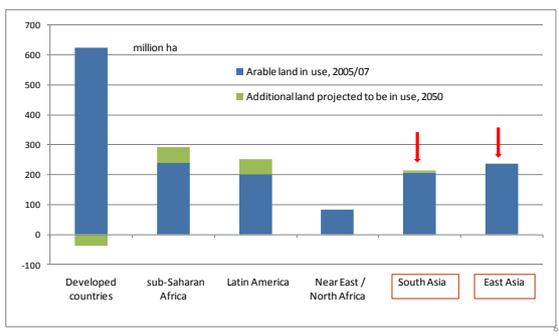
- a) The promotion of what is called Climate-Smart Agriculture - defined by FAO as agriculture that sustainably increases productivity, resilience and reduces or removes Greenhouse gas emissions, and enhances achievement of national food security and development goals.
- b) It is also critical for LLDCs and SIDS to be supported to develop and implement the strongest possible National Adaptation Plans (NAPAs) for climate change, and National Action Plans (NAPs) to fight desertification and manage natural resources.
- c) There is a need for LLDCs and SIDS to build diversified economies that are resilient to economic shocks and capable to produce a range of value added goods which are competitive on the world market.
- d) International efforts should be undertaken to pool resources for special climate disaster risk insurance fund that targets the most vulnerable countries.
- e) Establish and equip research institutions for measuring and evaluating desertification, land degradation and other climate change causes.
- d) Develop human and institutional capacities to effectively deal with these challenges.

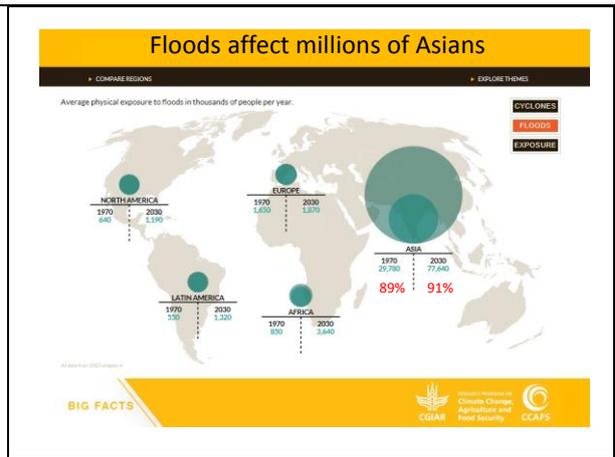
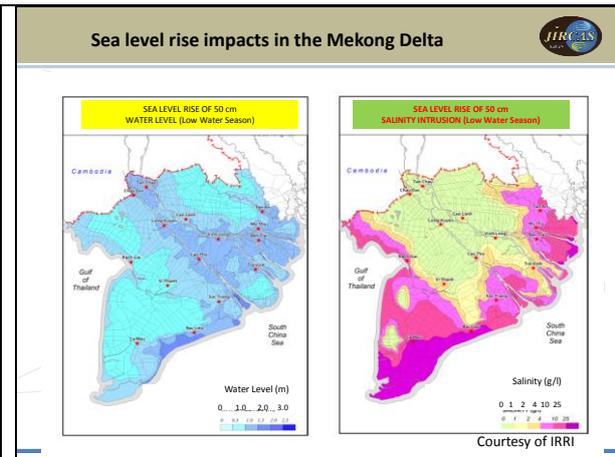
This is an historic year for the LLDCs and the SIDS. The Second UN Conference on the LLDCs, which will comprehensively review the 10-Year Almaty Programme of Action is planned to take place 3-5 November in Vienna, Austria. On the SIDS side, the United Nations General Assembly designated 2014 as the International Year of the SIDS. In addition, the Third International Conference on SIDS is scheduled to be held in Apia Samoa in September. During these Conferences, the strategies to further sustainable development of the LLDCs and SIDS will be discussed. Our Office and the LLDC group are actively involved in the discussions related to the Post-2015 Development Agenda, in which climate change and food security have become even more prominent concerns.

UN-OHRLLS is committed to helping LLDCs take the full advantage, and benefit from all these processes. It is against this backdrop that we are in the process of publishing a comprehensive report titled: “The Impact of Climate Change, Desertification and Land Degradation on the Development Prospects of Landlocked Developing Countries”. Parts of this presentation are based on this report. I welcome you to take an advanced copy that has been made available.

I thank you.

# Annex 7 – Keynote Address by Dr. M. Iwanaga, JIRCAS

 <p><b>Impact of Climate Change on Food Security: Asia-Pacific Perspectives</b></p> <p>Masa IWANAGA President, JIRCAS A member of UN's CFS-HLPE</p> 	<p><b>Outline</b></p> <ol style="list-style-type: none"> <li>1. Food security challenges and climate change</li> <li>2. Asia-Pacific specific challenges</li> <li>3. Solutions through technology development             <ul style="list-style-type: none"> <li>– Incentive-led technology adoption by farmers</li> <li>– Farmer participatory approach</li> </ul> </li> </ol>																					
<p><b>Food Security Challenges</b></p> <ul style="list-style-type: none"> <li>• Increasing demands             <ul style="list-style-type: none"> <li>– Population increase/urbanization</li> <li>– Changing diets (e.g. more meat consumption)</li> </ul> </li> <li>• Supply constraints             <ul style="list-style-type: none"> <li>– Stretched natural resources base</li> <li>– Limited land expansion possibility</li> <li>– Declining yield increase</li> </ul> </li> <li>• C.C. has major and multiple implications on food security</li> <li>• How effectively achieve a food secure world in the face of the mega-challenge of climate change?</li> </ul>	<p><b>High Level Panel of Experts (HLPE) of UN Committee on World Food Security (CFS)</b></p>  <ul style="list-style-type: none"> <li>• Review existing assessments and initiatives on the effects of climate change on food security and nutrition</li> <li>• Focus on             <ul style="list-style-type: none"> <li>– the most affected and vulnerable regions and populations,</li> <li>– the interface between climate change and agricultural productivity,</li> <li>– the challenges and opportunities of adaptation and mitigation policies and actions for food security and nutrition.</li> </ul> </li> </ul> <p><a href="http://www.fao.org/cfs/cfs-hlpe">www.fao.org/cfs/cfs-hlpe</a></p>																					
<p><b>Why is Asia-Pacific more vulnerable to CC?</b></p> <ol style="list-style-type: none"> <li>1. Huge population and serious poverty</li> <li>2. Frequent extreme weather events</li> <li>3. Large coastal zones</li> <li>4. Diverse agro-ecosystems</li> <li>5. Large dry and semi-dry areas</li> <li>6. Current and future dependence on livestock</li> </ol>	<p><b>Limited Scope Exists for Expansion of Arable Land in Asia</b></p>  <table border="1"> <caption>Arable Land in Use and Projections (million ha)</caption> <thead> <tr> <th>Region</th> <th>Arable land in use, 2005/07</th> <th>Additional land projected to be in use, 2050</th> </tr> </thead> <tbody> <tr> <td>Developed countries</td> <td>~620</td> <td>~0</td> </tr> <tr> <td>sub-Saharan Africa</td> <td>~280</td> <td>~100</td> </tr> <tr> <td>Latin America</td> <td>~250</td> <td>~100</td> </tr> <tr> <td>Near East / North Africa</td> <td>~100</td> <td>~0</td> </tr> <tr> <td>South Asia</td> <td>~220</td> <td>~180</td> </tr> <tr> <td>East Asia</td> <td>~250</td> <td>~150</td> </tr> </tbody> </table> <p>Source: Bruinsma, 2011</p>	Region	Arable land in use, 2005/07	Additional land projected to be in use, 2050	Developed countries	~620	~0	sub-Saharan Africa	~280	~100	Latin America	~250	~100	Near East / North Africa	~100	~0	South Asia	~220	~180	East Asia	~250	~150
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### Research and development for C.C.

- Adaptation and **mitigation**
- Sources of agricultural GHGs (IPCC Report)
  - 26 to 32% (2005) of entire GHG emission
  - Reduction of GHG emission (mitigation) is a must
    - Paddy fields (rice)
    - Livestock: 15% of total global GHG emission

**How to create incentives for farmers?**

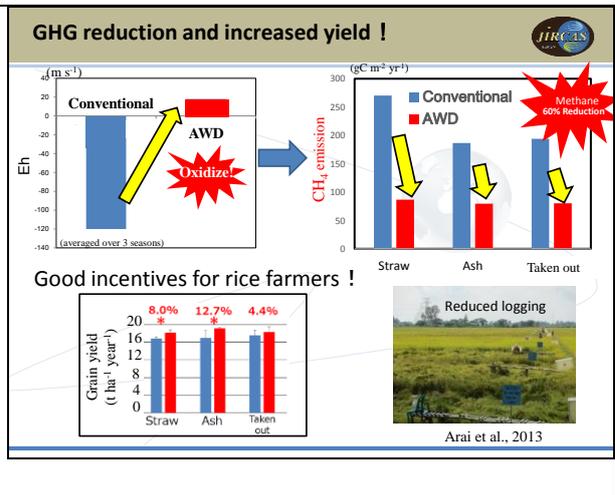
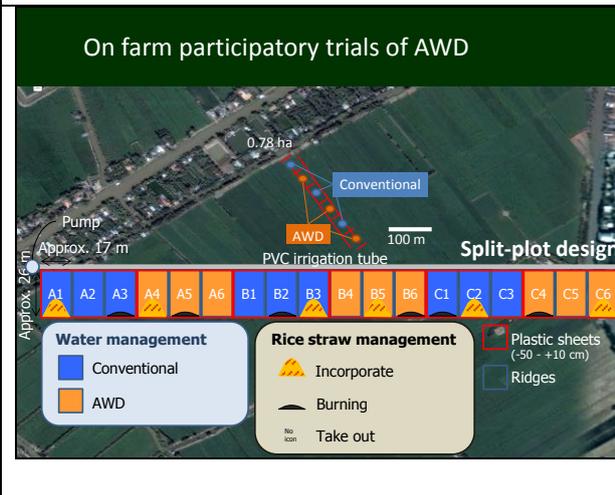
- Three examples from our research in Vietnam

### Alternate wetting and drying (AWD)

- Irrigate when water is 15 cm below soil surface
- Less CH<sub>4</sub> (methane) emission

Incentives for farmers!

- 15-30% less water
- Increased yield !





Farmers and community participation

Ventilated Hood System to analyze methane production from ruminants in Khon Kaen University, Thailand and Can Tho University, Vietnam



TMR: Rice straw + rice bran + cassava waste + brewer's grains

**Conventional feeding**  
Rice straw 1 : Pangola hay 9  
CH<sub>4</sub> production: 68.7 L/day  
Daily gain (DG): 0.015kg/day

**TMR (Total mixed ration) feeding**  
CH<sub>4</sub> production: 56.0 L/day  
Daily gain (DG): 0.303kg/day

Cai et al., unpublished

CDM project for introduction of biogas digester

- CDM (Clean Development Mechanism) project in Vietnam
- Use of biogas digester (BD)
- 301 families in 3 districts in Can Tho City
- GHG emission reduction by substituting fossil fuel and non-renewable firewood with pig-produced methane
- Formal recognition and registration of this project by UN's CDM Board in 2012



Pigpen  
(Excreta)



Biogas digester



Cooking

Participatory monitoring of GHG reduction

Farmers record daily use (hours) of biogas



Results (hours) by 301 families, June 1~August 31, 2013

Use	No use	Less than 2	2-4 hrs	> 4 hrs	Total
Day	849	2,678	16,251	7,884	27,662
(%)	3.1	9.7	58.7	28.5	100.0

The above monitoring results will be used for obtaining CER credit (\$).

Summary

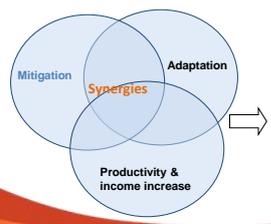
1. Climate change is one of the largest uncertainties in achieving global food security.
2. Asia and the Pacific region are highly vulnerable to extreme weather events and C.C.
3. A wide range of technologies that can mitigate and/or adapt to C.C. are being developed.
4. Clear benefits and farmer participation are the keys to the adoption of new technologies by farmers.
5. Regional collaborations that tackle C.C. must be enhanced.

Thank you for your attention

Contact at miwanaga@affrc.go.jp



# Annex 8 - Presentation by Ms. W. Khim on FAO's Climate Smart Agriculture

<h2 style="text-align: center;">Climate-smart agriculture at FAO</h2> <h3 style="text-align: center;">FAO activities and current status of CSA alliance</h3> <p style="text-align: center;">High-Level Forum on "Climate Change and Food Security in the LLDCs and SIDs in Asia and the Pacific" Ulaanbaatar, Mongolia, 12 March 2014</p> 	<h2 style="text-align: center;">What is CSA?</h2> <h3 style="text-align: center;">CLIMATE-SMART AGRICULTURE 3 pillars</h3> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>SUSTAINABLY INCREASING PRODUCTIVITY AND INCOME</p>  </div> <div style="text-align: center;"> <p>ADAPTING AND BUILDING RESILIENCE TO CLIMATE CHANGE</p>  </div> <div style="text-align: center;"> <p>REDUCING AND/OR REMOVING GREENHOUSE GASES EMISSIONS</p>  </div> </div> 
<h3 style="text-align: center;">FAO and CSA</h3> <p style="text-align: center;">...how to address the multiple demands placed on agriculture</p> <h4 style="text-align: center;">CLIMATE-SMART AGRICULTURE Encompassing 3 pillars:</h4> <div style="display: flex; align-items: center;">  <div style="margin-left: 20px;"> <ul style="list-style-type: none"> <li>creates synergies between food security, adaptation and climate change mitigation</li> <li><b>Main objective:</b> Pathway towards <b>enhanced food security</b> and <b>development goals</b></li> <li>climate change mitigation is a potential secondary co-benefit, especially for low-income, agricultural-based populations</li> </ul> </div> </div> 	<h3 style="text-align: center;">Key FAO publications on CSA and Knowledge Portal</h3> <div style="display: flex; flex-direction: column; align-items: center;"> <div style="display: flex; align-items: center; margin-bottom: 10px;"> <div style="background-color: #4CAF50; color: white; padding: 5px 10px; margin-right: 10px;">2010</div> <div style="border: 1px solid #ccc; padding: 5px; margin-right: 10px;">"Climate-smart" Agriculture: Policies, Practices and Financing for Food Security, Adaptation and Mitigation</div>  </div> <div style="display: flex; align-items: center; margin-bottom: 10px;"> <div style="background-color: #FF9800; color: white; padding: 5px 10px; margin-right: 10px;">2012</div> <div style="border: 1px solid #ccc; padding: 5px; margin-right: 10px;">3 FAO papers on CSA developed for the Vietnam Conference</div>  </div> <div style="display: flex; align-items: center;"> <div style="background-color: #9C27B0; color: white; padding: 5px 10px; margin-right: 10px;">2013</div> <div style="border: 1px solid #ccc; padding: 5px; margin-right: 10px;">Climate-smart Agriculture Sourcebook</div>  </div> </div> <p style="text-align: center;"><a href="http://www.climatesmartagriculture.org/en/">http://www.climatesmartagriculture.org/en/</a></p> 
<h3 style="text-align: center;">FAO's work on CSA is linked to other important FAO Climate Change initiatives</h3> <div style="display: flex; flex-wrap: wrap; justify-content: space-around; text-align: center;"> <div style="width: 20%;">  <p>Climate change adaptation (CCA) and Disaster Risk Reduction (DRR)</p> </div> <div style="width: 20%;">  <p>Mitigation of Climate Change in Agriculture (MIICCA)</p> </div> <div style="width: 20%;">  <p>FAO's Forest and Climate Change Programme</p> </div> <div style="width: 20%;">  <p>FAO's Fisheries and Aquaculture Programme</p> </div> <div style="width: 20%;">  <p>Sustainable Crop Production Intensification</p> </div> </div> 	<h3 style="text-align: center;">Selected FAO success stories on CSA</h3> <ul style="list-style-type: none"> <li><b>The Three Rivers Sustainable Grazing Project</b> <ul style="list-style-type: none"> <li>A pilot project in the Qinghai province of <b>China</b></li> <li>Yak- and sheep-herding households select management options related to grazing intensity, grass cultivation and animal husbandry</li> </ul> </li> <li><b>The Economics and Policy Innovations for Climate-Smart Agriculture (EPIC) Vietnam (Northern Mountains)</b> <ul style="list-style-type: none"> <li>Conservation land management practices for maize systems in the uplands and barriers to their adoption</li> <li>Diversification of productive activities into other crops (such as coffee and tea)</li> </ul> </li> <li><b>Sustainable Forest Management in the Philippines</b> <ul style="list-style-type: none"> <li>Promoting assisted natural regeneration for effective low-cost forest restoration, as a means to halt further forest degradation while increasing carbon sequestration and contributing to climate change mitigation.</li> </ul> </li> </ul> 

## Selected FAO success stories on CSA

- **The Three Rivers Sustainable Grazing Project**
  - A pilot project in the Qinghai province of **China**
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## Nature and objectives of the CSA Alliance

### Goal of the Alliance

•Catalyze coordinated and effective initiatives for action on the ground to address food security and climate change challenges through CSA. The Alliance will be:

- A food security focused, agriculture-driven and action-oriented coalition;
- An all-inclusive platform for dialogue and debate, advocacy and inspiration for a CSA vision.

### Membership

• The Alliance will be a self-governed voluntary consortium open to governments, international and regional organizations, institutions, civil society and private organizations



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Annex 9 – Closing Remarks by DG

**High-Level Forum on “Climate Change and Food Security in the Landlocked Developing Countries and Small Island Developing States in Asia and the Pacific Region”**

**Closing Remarks by FAO Director-General**

**José Graziano da Silva**

*Ulaanbaatar, Mongolia, March 12, 2014*

Your Excellency, Mr. Khaltmaa Bhattulga, Minister of Industry and Agriculture of Mongolia,

Excellencies,

Distinguished Guests,

Ladies and Gentlemen,

It is my privilege to bring to a close this High-Level Forum on Climate Change and Food Security in the Landlocked Developing Countries and Small Island Developing States in Asia and the Pacific Region.

Let me begin by thanking the Government of Mongolia, and in particular Minister Bhattulga, for hosting this Forum.

I also wish to convey my personal gratitude and appreciation to every Minister and senior Government official who has traveled a long way to represent their country in this Forum.

I can see several Ministers and Vice Ministers present here. This is a good indication of the relevance that the topic before us has for your countries.

Our discussions today highlighted the precarious position that you are being exposed to. Not due to any fault of your own, but because of climate change.

In Small Island Developing States, the fact that you are surrounded by water poses a threat because of the sea level rise due to climate change.

In Landlocked Developing Countries, the lack of access to water and waterways to transport your production has become a heavy burden to your development.

Under these conditions, it is no surprise that the issue of food security is closely linked to climate change.

I was told that the two excellent keynote presentations by Dr. Erdenebileg and Dr. Iwanaga underpinned your discussions.

They highlighted the importance of increasing awareness among the global community of the special situation of the Landlocked Developing Countries and Small Island Developing States.

And they underscored the need to pursue adaptation measures to alleviate the impact of climate change on food security.

We welcome the interventions from you all on the clear paths needed to respond to these issues.

You have all pointed out that, in the face of new constraints such as climate change, there is a greater need to revise and renew the strategy to revitalize the agriculture sector in order to achieve food security.

Beyond that, I am grateful for all the insightful ideas and useful suggestions on how to achieve food security in the face of climate change.

Allow me a few moments to highlight the link between them and how FAO is addressing it.

Agriculture and fisheries are dependent on specific climatic conditions.

Climate change causes temperature increase over the long-term, and the increased frequency and severity of droughts and floods.

These factors make it more difficult to grow crops, raise animals, and catch fish in the ways we have done in the past.

The conditions in Landlocked Developing Countries and Small Island Developing States are already vulnerable and climate change can only worsen them.

We must also bear in mind that agriculture and livestock production contribute to greenhouse gas emissions.

Fortunately, sustainable solutions are available that can improve the productivity while reducing greenhouse gas emissions.

They include more efficient crop varieties, improved nutrition for ruminant livestock, better management of livestock waste, organic soil management, and conservation agriculture, to name a few.

It is in our interest to adopt management systems that combine adaptation and mitigation, which will lead towards improving local and global food security.

FAO possesses the technical expertise relevant to climate change adaptation in agro ecosystems, forests, inland waters and coastal and marine ecosystems. Our job is to share it with you. And to serve as a bridge between your own experiences.

In 2007, FAO recognized the critical importance of climate change for food security, and introduced guidelines for incorporating actions to mitigate and adapt to climate change.

FAO is helping governments include adaptation and mitigation measures in their national programs.

But FAO is not pushing for “one size fits all” solutions that experience has shown do not work. Instead, FAO is adopting a different approach, which involves governments and local communities in identifying and implementing site-specific solutions.

Ladies and gentlemen,

I find it refreshing to have learned about your deliberations on effective policies and actions to minimize the negative impacts of climate change on food security.

They have truly resulted in an excellent set of recommendations for adaptation and mitigation actions to ensure the resiliency of the agriculture sector.

You have given us your priorities, which clearly resonate with our Revised Strategic Framework and the Program of Work FAO has proposed.

We will respond to your needs both at the national and regional levels.

Even if we are isolated small islands or landlocked countries, we are still part of the globalized world.

We need to work together in order to ensure food security. A food secure country guarantees a food secure world.

I now declare this Forum closed.

Thank you.