



MY MEETING NOTES

Workshop on
Climate Change Adaptation and Disaster Management in Agriculture
11-15th September, 2017
Full Moon Garden Hotel, Katunayake, Sri Lanka



Asian Productivity Organization (APO), Tokyo in association with Ministry of Agriculture, Sri Lanka, and Centre for Integrated Rural Development for Asia and Pacific (CIRDAP), Dhaka, organized this international workshop to share smart innovative technologies and integrated frameworks for effective climate change adaptation in agriculture. Dr. Channappagouda Biradar reflects on his participation at this event.

CONTEXT

Agriculture and food production systems are highly vulnerable to climate change. For example, changes in the frequency, timing, and magnitude of precipitation and temperature directly affect production systems. Similarly, climate change-related disasters like frequent and unpredictable floods and droughts, heat waves, heavy snowfall and glacial melting, and increased incidence of pests and diseases are already causing widespread damage and loss to the agricultural sector. The consequent crop failures and livestock deaths could cause huge economic losses to farmers, contributing to volatility in agricultural markets and higher food prices, thus undermining food security in many developing countries.



Climate change brings new uncertainties, adds new risks, and changes existing risks. Many countries have undertaken initiatives to mainstream adaptation into policy, development planning, and programme formulation. Systematic efforts are needed to

improve the sustainability of food production systems and ecosystem resilience under changing climate conditions. Addressing climate-related risks and uncertainties in agriculture and food security require the development of national integrated frameworks for the sector and identification of priorities in line with other national programmes and strategies. Such initiatives are expected to prevent policy conflicts and result in greater efficiency in the use of financial resources compared with managing adaptation separately.

In this context, Asian Productivity Organization (APO) organized this international workshop with following objectives:

- To study the future scenarios of climate change and associated natural disasters and their potential impact on agricultural productivity and the livelihood of farming/rural communities;
- To share smart innovative technologies and integrated frameworks for effective climate change adaptation on agriculture;
- To review policies, programmes, and plans on developing climate change adaptation measures in agriculture and managing risks of extreme weather events and disasters associated with climate change to enhance sustainability in agriculture and to contribute to achieving the targets of the UN Sustainable Development Goals; and
- To formulate strategic action plans for member countries to integrate climate change adaptation and climate-related disaster risk management measures into national agricultural policy, programmes, and plans for developing sustainable agriculture.

In this international workshop there were 29 participants from 11 different Asia-Pacific countries and 7 resource persons from 4 different countries, apart from representatives from APO, CIDRAP and Ministry of Agriculture (MoA), Sri Lanka.

PROGRAMME

Inaugural Session



The brief inaugural programme started with prayer and a welcome address by Dr. Keerthi Hettiarachchi, Additional Secretary (Agricultural Technology), who commented that the workshop as very apt to Sri Lanka as the country is facing floods and drought very frequently. The workshop was inaugurated in traditional Srilankan style by Mr. B. Wijayaratne, Secretary, MoA, Sri Lanka.

In his welcome message, APO representative Mr. Mitsuo Nakumura thanked the local coordinating organisations – the MoA, National Productivity Secretariat, Sri Lanka and CIDRAP,

Dhaka. He opined that the climate change was the biggest challenge in front of the agriculture sector which is expected to feed 250 billion people is not an exception to this. Mr. Wijayaratne, in his inaugural address, described knowledge as a capital and power which needs to be shared across countries in order to mitigate climate change. He said that there was an urgent need to adapt farming to the changing climate, because even though agriculture has been practised since the inception of civilization, it was now under threat due to repeated natural disasters and climate change. He further elaborated on how Sri Lanka was facing the natural calamities like drought/heavy rain and appraised the audience that agriculture is considered as a priority sector of development in Sri Lanka. During the programme, Additional Secretary (Development) Dr. W.M.W. Weerakoon; CIRDAP representative Ms. Elora Sharmeen; other agriculture ministry officials and resource faculty from different countries were present. This speech was followed by introduction of the participants and a vote of thanks by Mr. P. N.N. Jayanetti, Deputy Director, MoA, Sri Lanka.

Overview of Technical Sessions

The five-day workshop was divided into nine technical sessions which included 13 resource paper presentations, 11 country paper presentations, field visits, group exercises and chalking out of follow-up actions. The resource paper presentations discussed various social and economic dimensions of climate change and disaster management including risk reduction strategies.

Session I: Future scenarios of climate change and natural disasters and their impact on agricultural productivity and the livelihood of farming communities

The first presentation was on Effects of disasters and CC on food security in ASEAN region by Dr. Venkatachalam Anbumozhi from India. He shared the information on region-wise loses between 2003 and 2013 in terms of crop and livestock production and quoted from his studies that by 2050 there will be decrease in yield and increase in price of food grains if the same environmental trend continued. Further, he listed the proactive and reactive measures to be adopted to reduce the impact of Climate Change (CC) on food security and emphasised the need for active support from the government and for bringing private sector into action to mitigate CC impact.



The second presentation was 'Impact of CC on Agricultural Productivity, Sustainability, and Food Security in SAARC Region' by Dr. Ashfaq Ahmad Chatta, Program Chair (CC) of SAARC. His presentation laid emphasis on how crop yield and production stability would be affected due to CC. In his talk, he narrated how SAARC countries were most vulnerable to CC and disasters, despite being negligible contributors to CC. He quoted crop models that predicted that by 2050, average yields in South Asia would decline from 2000 levels by about 50% for wheat, 17% for rice, and 6% for maize; as a result food insecurity may increase, especially in

South Asia. In his presentation, he also elaborated on the DFID-funded project Agricultural Model Intercomparison and Improvement Project (AgMIP) in Pakistan – A Case Study, along with its findings in two phases. He demonstrated the links between agriculture sustainability and climate change-associated disasters.

Box 1: Asian Productivity Organization

The Asian Productivity Organization (APO) is a Tokyo-based nonpolitical, nonprofit and nondiscriminatory regional intergovernmental organisation established on 11 May 1961. APO membership is open to countries in Asia and the Pacific which are members of the United Nations Economic and Social Commission for Asia and the Pacific (UN ESCAP). The current membership is 20 economies, comprising Bangladesh, Cambodia, Republic of China, Fiji, Hong Kong, India, Indonesia, Islamic Republic of Iran, Japan, Republic of Korea, Lao PDR, Malaysia, Mongolia, Nepal, Pakistan, Philippines, Singapore, Sri Lanka, Thailand and Vietnam. These countries/economies pledge to assist each other in their productivity drives in a spirit of mutual cooperation by sharing knowledge, information, and experience. The APO basically comprises the Governing Body, the NPOs, and the Secretariat, which is headed by a Secretary-General.

Its vision and mission are as follows:

Vision: To be the leading international organisation on productivity enhancement, enabling APO economies to be more productive and competitive by 2020

Mission: To contribute to sustainable socioeconomic development of Asia and the Pacific by enhancing productivity



Fig 1: Five key roles of APO

For more details: visit <http://www.apo-tokyo.org/about/>

The third presentation was on 'Future Scenarios of CC and Associated Natural Disasters on the Livelihoods of Farming Communities: Experience of Thailand' by Prof. (Dr). Attachai Jintrawet of Thailand. He elaborated on various crop (rice) production models developed in Thailand, including the methodology. In his presentation, he urged the participants to involve the younger generation in trainings and workshops related to climate change and agriculture. He

called upon them to understand the need to work as a team with concerned stakeholders for effective outcome.

Session II: Disaster Risk Reduction in Agriculture

Disaster Risk Reduction (DRR) aims to reduce the damage caused by natural hazards like floods, droughts, cyclones and earthquakes, through adopting preventive measures. Development of CC- and disaster-resilient agriculture can help to reduce the impact of natural hazards on food production systems, food security and livelihoods of farming communities. In this session also there were three presentations on different aspects.

The first presentation was on 'Building the Resilience of Agri-food Supply Chains against Natural Disasters' by Dr. Venkatachalam Anbumozhi. He threw light on *ex-post* and *ex-ante* risks involved in supply chain and how risk financing could overcome these risks. He explained how improved agrifood supply chain resilience could be achieved by DRR, climate change adaptation and disaster risk financing, along with strengthened risk



governance at national level and business capacity development with regional cooperation and coordination. He also shared micro and macro areas of disaster impacts on agriculture food supply chains. He listed measures such as business continuity plan, investment in higher level of protection at workplace, and creation of redundancy (multiple sourcing, duplication of production locations etc.) for higher supply chain resilience in agriculture.

The second presentation was by meteorologist Dr. Malith Fernando from Sri Lanka on 'Early Warning Systems and Their Role in Preparedness for Climate- induced Disaster Risk Reduction'. He elaborated on various models used to forecast the southwest monsoon rainfall in Sri Lanka and brought out the overall projected picture of climate events in country. He also discussed the importance of early warning systems in DRR.

Session III: Measures for Building Climate-Resilient Agriculture

As increasing climate variations and frequency of natural disasters bring new uncertainties, risks and changes to the existing agricultural production risks, building resilience is critical if the agriculture sector is to adapt to CC. Building resilience is a total system response, and needs to be at the centre of preparation strategies to tackle current uncertainties induced by CC. This session, chaired by Dr. W.M.W. Weerakoon, Additional Secretary, Ministry of Agriculture, had four presentations on different aspects of building resilience in agriculture and allied sectors.

The first presentation was 'Seasonal Rice-yield Forecast to Handle Climate Variability' by Prof. (Dr). Attachai Jintrawet. He shared the lessons learned from a new R&D agenda on a seasonal rice yield/production forecast system in Thailand and showed how an integrative and inclusive approach used to handle short-term variability for resilient and sustainable rice production

systems in Thailand. In this, he stressed upon the need to combine three Ps – Policy, Plan and Programme – to handle the climate variability. He stated that the 3Ps should aim towards efficient resource utilisation, poverty reduction (job creation), and environment-friendly production and consumption systems for sustainable development. He called upon the participants to work together to handle climate variation and change through systemic implementation, inclusiveness, investment and adoption of IT tools by agricultural researchers to improve understanding, predicting capacity and managing limited and complex agricultural resources. Further, he opined that, while everyone knew their teacher, doctor, dentist, etc., no one could trace the farmer who produced food for all; he emphasised the need to make the farmer ‘traceable’.

The second presentation, by Dr. Ashfaq Ahmad Chatta, was on ‘Building Resilience and Adaptation to CC in the Crop Sector’. In this presentation, he shared various adaptation strategies followed like rice-wheat cropping system across the Punjab region of Pakistan; weather-based insurance (Pradhan Mantri Fasal Bima Yojana) in India; building climate-resilient communities in the mountains of Nepal; Vulnerability Assessment and Adaptation Programme for Climate Change within the Coastal Zone of Cambodia; Urea Deep Placement (UDP) in Bangladesh; Sustainable Intensification of Rice Production in Vietnam etc. He elaborated on different Top-Down Approaches (tools) and Bottom-Up Approaches (tools) for climate-resilient production. He opined that lately there had been great focus on increasing agriculture production through use of synthetic toxic chemicals, but by ignoring the good side of farmers’ traditional practices and without giving importance to post-harvest management. Now it was time to rectify those mistakes to realise sustainable agriculture production.



The third presentation was on ‘Building Resilience and Adaptation to CC in the Livestock Sector’, by Ms. Maheshika, a faculty member of the Sri Lanka University. In her presentation, Ms. Maheshika talked about the contribution of the livestock sector, and the drivers and challenges of the livestock industry. She expressed the view that although livestock was said to be the reason for the changing climate, CC was impacting the livestock production system substantially, especially the smallholder system. She discussed various aspects of impact of climate change on livestock industry and issues as well as various approaches in climate-resilient livestock production.

The fourth presentation was on ‘Building Resilience and Adaptation to CC in the Fisheries Sector’, by an oceanography expert, Dr. K. Arulanathan from Sri Lanka. His presentation focused on climate change and its threats on the fishery habitat, and discussed the national

climate change adaptation strategy. He elaborated on various adaptation measures to be taken by fishing communities. The last presentation of the session was delivered by APO representative Mr. M. Nakamura on food production technologies for all weathers. He elaborated on the concept of Plant Factory with Artificial Lights (PFAL) practiced in Japan, its mechanism, advantages as well as demerits. He opined that PFAL, with its high productivity, minimal resources and negligible emission of environmental pollutants, can become a key component in urban agriculture to solve the food, environment and social 'tri-lemma' of issues in urban areas; however, right now it is just the beginning of PFAL technology.

Session IV: Integration of climate change adaptation and climate-induced disaster risk reduction into national agricultural policy, programmes, and plans for developing sustainable agriculture



Disaster risk reduction (DRR) is the concept and practice of reducing disaster risks through systematic efforts to analyse and reduce the causal factors of disasters. Though technology development is needed in order to reduce the risks associated with disaster, governance and financial systems are other factors to be considered on priority for effective mainstreaming of activities as each decision and action makes us more vulnerable or more resilient to

disasters. This session, chaired by Dr. Ashfaq Ahmad Chatta, had two presentations.

In a presentation delivered on the first day by Dr. Anbumozhi, he had discussed on how Climate Change Adaptation (CCA), Disaster Risk Reduction (DRR), and Sustainable Development Goal (SDG) agendas were converging with each other and listed the various barriers to achieving the SDGs. He opined that CCA and DRR need early warning systems and analytical capacity to estimate vulnerability; this needs mainstreaming of policies related to CCA and DRR, overcoming barriers of knowledge gap, capacity gap and finance gap.

Dr. Agastin Baulraj, Professor of Economics from India, delivered two talks in this workshop. In his talk 'Disaster Risk Management in Agriculture in an Era of Climate Uncertainties', he listed various disaster losses occurred across the region in recent past and enlisted ideal measures. In the second talk on Day 4, he discussed different agriculture insurance tools for supporting small Asian producers and agribusiness SMEs for developing climate change resilience.

Panel Discussion

There was a panel discussion on Day 4 about the 'Contribution of CC-resilient Agriculture to Achieving Targets Set under UN-SDGs' and Dr. Anbumozhi acted as chief panelist along with other resource persons. Dr. Anbumozhi initiated the discussion by throwing light on the learnings of this workshop. Later participants expressed their ideas on climate-resilient agriculture and its contribution to the socioeconomic development of individuals as well as nations. I elaborated how food security, climate change and disaster form a Virtuous Circle for



Sustainable Development. I made it clear that adaptation to CC should be considered as a short-term measure while mitigation of CC should be our long-term target to make development more sustainable. Resource persons also discussed different dimensions of climate-resilient agriculture. The house consciously agreed with the fact that all the UN SDG are interlinked and climate-resilient agriculture has a direct relation with SDGs such as Affordable and Clean Energy (7th), Responsible Consumption and Production (11th), Climate Action (13th), Zero Hunger (2nd) etc. The house finally concluded that linking CC mitigation with funding locally and globally along with location-specific resilience policy and capacity building of stakeholders for risk reduction as well as mitigation will go a long way in achieving sustainable development of agriculture.

Session V: Challenges and Successful Experiences in Mainstreaming Climate Change Adaptation and Disaster Risk Reduction to Achieve Targets Set under the UN-Sdgs: Sharing of Country Experiences by Participants

As an effort to provide platform for sharing of information/experience among the participant countries, an opportunity was provided to their country paper with an allocation of 25 minutes to each country. A total of 11 participants from two countries presented on Day 2 and participants from nine countries presented their papers on the morning of Day 4.

Session VI: Site Visits

The participants were taken to Rice Research and Development Institute (RRDI) on Day 3. RRDI, located at Bathalagoda, is responsible for overall research on rice. Dr. (Ms). Bentota A.P., Director of the institute briefed the visitors about institute activities and rice research development in Sri Lanka. From her presentation, it was understood that the Institute played a major role in the country's rice sector by releasing new high-



yielding rice varieties and introducing improved rice production and protection technologies to help farmers realise the yield potentials of the area. The research and development program at RRDI focuses on increasing farm productivity from the current 4.3 t/ha to 5.0 t/ha within the next five years while reducing cost of production and improving grain quality of rice. She stated that RRDI was working to strengthen research and development activities with respect to varietal improvement; soil fertility and its sustainability; pest, disease and weed management; post-harvest, grain quality and production technologies; including addressing the issues of changing climate and repeated natural disasters. Later Dr. Keerthisena R.S.K., Additional Director of Institute, took the participants across the different labs and paddy fields.

After that, we visited the Bathalagoda Wewa (tank) located near RRDl. The history of this tank was an ideal example of how ancestral civilisations were also working for disaster mitigation, water conservation and irrigation. According to Mr. Parker, a historian who was involved in the restoration of the Bathalagoda Wewa around 1890, its antiquity is proved by the dimensions of the bricks found at its southern sluice, its flood escape and a building which may have been close to the southern end of the embankment. After visiting the site, we could understand that it was a beautiful ecological system which had been rejuvenated and maintained and it had historical significance too. Further, we were told that this tank played a very important role in Sri Lankan rice development through continuous supply of water to the requirements of RRDl.

Session VII. Group Exercise

The participants were divided into four teams to enhance their learning experience through capturing the salient lessons and insights they learnt from this workshop, through sharing good practices among themselves based on the resource paper and country paper presentations, discussions over the past three days, field visit(s), and their own back-home observations and experience, and to have detailed deliberations on the specified themes (Box-2). Four resource persons acted as facilitators to each group. They identified issues and challenges in the assigned thematic area, prioritised them, and proposed workable action plans and roadmap, and listed



responsible organisation(s) for the five most important issues and challenges as given in Box-3. The group exercise provided an opportunity for one-to-one interaction among participants. This exercise lasted around three hours on the 4th and 5th days of the workshop. The issues identified by different teams suggest regional variations in the effect and impact of CC as well as disaster management. Further, the outcome of team presentations was pointing towards disintegrated approaches due to lack of coordination, political unwillingness, inaccessible information at grassroots level and financial crunch as measure challenges.

Box- 2: Identified themes

Team #	Team 1	Team 2	Team 3	Team 4
Theme area	Climate Change Adaptation (CCA)	Climate-related Disaster Risk Reduction(DRR) in Agriculture	Development of Climate Change-Resilient Agriculture	Integrating CCA and DRR Measures into National Agricultural Policy, Programmes and Plans

Box- 3: Issues identified by teams under different thematic areas			
Climate Change Adaptation (CCA)	Climate-related Disaster Risk Reduction(DRR) in Agriculture	Development of Climate Change-Resilient Agriculture	Integrating CCA and DRR Measures into National Agricultural Policy, Programs, and Plans
Drought	Crop damage	Political willingness at decision-making level	Isolated policies on CC, DRM and agriculture leading to inadequate implementation of SDGs
Salinity	Reduction of yield	Less opportunities for farmers in decision making in agriculture planning – low or no representation	Financial constraints to get required climate outcomes
Flood	Shortages of fodder	Funds for research and co-adaptation program	Inadequate and credible climate information (forecasting system) including emerging transboundary issues
Landslide	Inefficient warning system	Gap between information on adaptation and farmers' priorities and information reaching the farmers. Additionally the issue of changing the attitude of farmers	Lack of knowledge and skills in handling CC & DRR- +
Pest and disease infestation	Runoff water/ Excess water	Knowledge and technology transfer barriers. Technological issues in practicing precision agriculture	Lack of location-specific profitable innovative strategies for CCA & DRR
# These issues listed are drawn by the team presentations in the workshop and not the opinion of organisers			

VALEDICTORY PROGRAMME

The workshop was concluded with a valedictory programme attended by Dr. Keerthi Hettiarachchi, Additional Director (Agri. Tech); APO representative Mr. Nakumura and other organisation representatives and resource persons. They distributed certificates to participants. Mr. Nakumura thanked the Ministry of Agriculture for successful organisation of workshop and called upon the participants to carry



out the follow-up actions as discussed in the workshop. The resource persons expressed their satisfaction about the participants' learnings and urged the representatives of different countries to work in coordination for better exchange of technology and knowledge by using this platform. Dr. Keerthi Hettiarachchi expressed his gratefulness to APO for providing an opportunity to host the event. On behalf of participants Dr. Channappagouda Biradar from India extended gratitude to organisers, APO and the Sri Lankan core team behind the workshop.

MY IMPRESSIONS

The workshop through speeches, expert resource papers, country papers, panel discussions and group exercise explored the latest trends, knowhow and practices related to mitigating climate change, disaster management, risk reduction and adaptation mechanisms in agriculture and allied sectors. The participants received valuable information from the different sessions and discussions. It is worth mentioning that the participants were actively involved in discussions in all the sessions and engaged keenly in the group exercise. In the valedictory session, a CD containing all presentations was given to participants and they were also uploaded on the CRISP website.

FINAL REMARKS

Generally young researchers and field extension functionaries rarely get opportunities to participate in workshops of this nature. However, this meeting offered an opportunity for several young participants working in agriculture and related fields to understand the local impacts of global issues like climate change on the poorest of poor and the innovative ways adopted by different countries to reduce such impact.

Climate change and disaster risk management has many implications on extension and advisory services. We need to focus on recycling of by-products of agriculture/ livestock rearing (e.g. cow dung and urine) by effectively converting them into biogas. There is awareness among field functionaries about climate change and disaster management, but extension services need to be strengthened to convert this awareness into knowledge and skill in order to address issues at the ground level. The workshop emphasised the need to involve NGOs and the private sector in combating major challenges encountered during disaster management. The deliberations also discussed the contribution of agriculture and animal husbandry to greenhouse gases and how extension and advisory services could help in its mitigation.

Though CC is global issue, it has local solutions. So percolation of CC-related information to grassroots level is very important. In order to facilitate better information exchange, workshops of this kind should have representation from the farming community also. Further, as a follow-up measure to convert learnings into field applications, international organisations need to come forward with a little funding to carry out need assessment exercise, success story documentation and sharing the learnings, which will go a long way in knowledge and technology transfer to grassroots level.

My sincere thanks to the Asian Productivity Organization, Tokyo; National Productivity Council, New Delhi and Karnataka Veterinary, Animal and Fisheries Sciences University, Bidar, India for facilitating this learning experience.

The Country paper and resource paper presentations can be accessed from following link

<https://drive.google.com/open?id=0B5kxYtiQX26IMkVOT0tJMFFHSkk>

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