



2018 Final Project Report
for
Academic Consortium for the 21st Century (AC21)
Special Project Fund

Mini Multi-style Workshop on Understanding
Water-Energy-Climate Change Nexus in a
Transitional World

December 25th, 2018

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1. Project Summary

Water and energy are both the foundation of human society and economy. The production and consumption of energy are closely integrated with that of water, and vice versa. In the past few decades, the rising demand to both energy and water has led to several crucial sustainability issues, such as climate change, renewable energy, urbanization, and responsible trading. Meanwhile, the changing natural, economic and political environment across the world would bring much uncertainty to energy and water issues, especially at this transitioning period for all countries.

There are many interesting issues which we shall put forward and discuss. How can our energy and water systems be more sustainable? How resilient are they against natural and social risks and potential disruptions? And how should different stakeholders, such as cities or multi-national companies, prepare themselves to understand sustainability and resilience in such context?

These questions arouse a lot of attention from governments, academia, companies, as well as the general public. To provide some preliminary answers, we applied the special fund from AC21 to support our multi-style mini "workshop" to: 1) try to establish a platform to bring together researchers from (non-)AC21 members of different countries who are interested in energy-water-climate change nexus (EWCN) in different research areas, to extensively exchange research ideas and methods thus discover further collaborative opportunities through multiple ways (online and onsite); 2) record what we has discussed and send out "EWCN highlights" to share these ideas and research results, not only in the academic world, but also among non-profit sectors as well as the general public.

Supported by AC21, we developed different ways to discuss, share and broadcast our understandings on EWCN. We believe that, these efforts would hopefully establish academic communications among universities and research centers from AC21 members and other institutes, facilitate publications, and create various funding proposals, as well as raise the AC21's reputation on both academic and non-academic fields, in the longer term.

2. Online workshop with (non)AC21 members on agriculture adaptation

This is a mini online workshop, held on March-April, 2018. The theme is about Chinese farmers' adaptation measures to climate change.

Climate change is threatening global food production and threatens to exacerbate food insecurity in many parts of the world. Take corn as an example. China is the world's second largest corn producer, and changes in China's corn production may have a significant impact on world food security. As grain producers, farmers are directly affected by the negative economic and environmental effects brought by the decline of grain output. Many studies have confirmed that temperature and precipitation are two important factors that will have a significant impact on grain yield, especially in recent years, rising temperature and increasing drought have significantly reduced corn yield.

In this small online workshop, members including Dr. Maoliang Bu from Nanjing University, Dr. Lijun Pan from Nagoya University, Dr. Anran Luo, from The University of Freiburg, Dr. from Dr. Hongtao Wang and Qiaoying Wang from Tongji University, as well as Dr. Yu Zhou from Waseda University and Dr. Lars Lauven, from Goettingen University, discussed whether and how farmers adopt adaptive measures has a lot to do with farmers' knowledge cognition, as well as their sensitivity and views on climate change. Farmers in areas where climate change is not evident often do not actively adopt adaptation measures, which can exacerbate future impacts.

We believe that, governments play an important role in climate change adaptation and need to positively explore market and non-market strategies conducive to adaptive measures to cope with food security changes.

3. Invited talk recording (1): from Dr. Susmita Dasgupta

Dr. Susmita Dasgupta is a lead environmental economist working in the Environment and Energy Research Group at World Bank. She is one of the few who always pay attention to climate change and adaptation in developing countries. In Dec 2017, she was invited by Dr. Beibei Liu and gave a talk in Nanjing University on how to adopt measures to cope with extreme climate events in developing countries.



Figure 1. Dr. Desgupta's talk in Nanjing (from the video)

Her visit was paid by her institution (the World Bank). And we do think recording her wonderful talk will help to distribute useful knowledge on EWCN.

Funded by AC21, Environmental Management and Policy Analysis Center (EMPA) and International Environmental Global Institutes (IGES), we cooperated with a professional video production company, to make the high quality video materials which promoted the barrier-free communication among scholars and the general public. Inspired by the AC21 special fund project, we initiated an Energy, Environmental and Climate Change (EECC) Salon Series, to invite experts, industrial leaders and lay person who have interests and experience in this field to share their ideas. We believed that, to some extents, we are all “blind men”, who only touched pieces of a huge elephant. We want to bring more pieces together to enlighten the world. These videos will be uploaded as the supporting materials of the international course titled Environmental Policy Analysis as well as the MOOC with the same name, which will be online next April



Figure 2. AC 21 Logo in our videos

4. Invited talk recording (2): from Dr. Billy Pizer

Dr. Billy Pizer is a professor of Environmental Economics and Policy, coming from Duke University Sanford School. He aims to research how public policies promote clean energy making full use of private sector investments, how environmental regulation and climate policy affect costs and competitiveness during producing process, and how to design market-based environmental policies meeting the needs of different stakeholders.

In April 2018, He was invited to Nanjing University to discuss how price variation and limits in tradable performance standards helps to achieve efficiency in the establishment of carbon market in China's power sector.

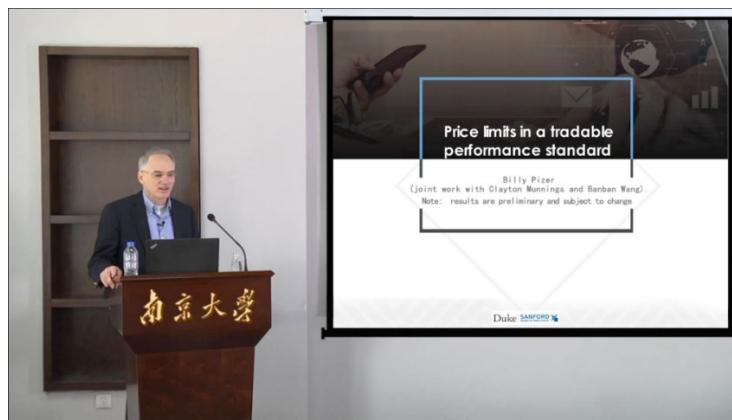


Figure 2. Dr. Pizer's talk in Nanjing (from the video)

His visit was paid by his own institution. As the organizer of the onsite visit, we used fund from AC21, EMPA and IGES, for not only providing a good environment, but also cooperating with video production company to make high quality video, which promoted the barrier-free communication among scholars and the general public, as well facilitated better dissemination to more teachers and students who are interested in this topic. This video is included in the EECC Salon Series.

We will continuously invite experts, industrial leaders and other person from AC21 and non AC21 members to join in the EECC salon.

5. Onsite meeting: Dr. Hongtao Wang, Tongji University

The onsite meeting was held in Nanjing on September 18th 2018. Dr. Hongtao Wang from Tongji University was invited to visit Nanjing University and discussed the adaptation of

megacities to climate change in developing countries.

Urban areas are increasingly at risk of climate change, which is expected to have negative impacts on human health, the economy and ecosystems. These risks require cities to respond, and policymakers need to plan comprehensively and effectively for current adaptation spending to improve their resilience. Studies have shown that the sample of megacity in developing countries spends more on health and agriculture, while the sample of megacity in developed countries spends more on energy and water.

Dr Hongtao Wang and Dr Beibei Liu discussed the ratio of per capita expenditure of different cities. Urban spending in developing countries accounts for half of GDP, and per capita spending is significantly lower than in developed countries, suggesting that wealth, not the number of vulnerable groups, is the driver of adaptation. Therefore, for developing countries, more quantitative measures of economic input of adaptation measures are needed in the future, which can most intuitively help policy makers analyze weights and make reasonable plans.

They discussed the future cooperation opportunities on this topic.

6. Onsite meeting with Dr. Lingxuan Liu (Lancaster University)

On Dec 22th, 2018, Dr. Lingsuan Liu from Lancaster University visited Nanjing University and discussed the potential cooperation with Dr. Beibei Liu, and proposed possible chances to cooperate with other AC21 members.



Figure 3. Dr. Liu's visit to Nanjing (Dec. 2018)

7. Timeline of Activities

March-April, 2018	Online workshop with (non)AC21 members on agriculture adaptation
April, 2018	Invited talk: Dr. Billy Pizer
April-July, 2018	Post production of invited talk from Dr. Desgupta and Dr. Pizer
September, 2018	Onsite discussion: Dr. Hongtao Wang
December, 2018	Onsite meeting: Dr. Lingxuan Liu
December, 2018	Final report

8. Acknowledgement

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