

## Parallel and integrated processes of climate-impact-socioeconomics for climate research

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The need to take mitigation measures in order to hold the increase in global average temperature below 2 degree C above pre-industrial levels are recognized in international negotiations of the United Nations Framework Convention on Climate Change (UNFCCC). According to the fifth assessment report (AR5) by the Working Group (WG) I of Intergovernmental Panel on Climate Change (IPCC) which was published last September, attaining the temperature goal with a probability of 50% will require cumulative CO<sub>2</sub> emissions from all anthropogenic sources to stay approximately 300 GtC from the present. If the current level of anthropogenic CO<sub>2</sub> emission, 10 GtC yr<sup>-1</sup>, continues, the cumulative emissions will reach this upper limit in only 30 years. If we will seriously pursue the goal of temperature increase below 2 degree C, global CO<sub>2</sub> emission should be turned to decline as soon as possible, and to be reduced at nearly zero by around the end of this century.

A great deal of research on climate change impacts and mitigation measures exist; however, large uncertainties remain in their overall pictures. So far, nobody can grasp clearly risks for human society and ecosystem associated with global warming exceeding "2 degree C", and risks for socioeconomics due to severe emission reductions of greenhouse gases. Furthermore, the risks will be realized in different ways by country, region, generation, and social attribution, and therefore, either if no specific response measures are conducted or if strong measures are conducted, a part of people in the world will have benefits and another part of people will make a loss. Climate change impact is not just an issue on benefits and losses of each person; but it relates to issues how we feel distress on risks for ecosystem, developing countries, and future generations. It relates to different value judgment among people.

Climate research plays a role to provide scientific information to help the societal decision making process of such an uncertain, complex and ambiguous risk problem. To pursue it, there has been a serious international activity to promote interaction across the three research communities, that is, climate, impact and socioeconomics (corresponding to the WG I, II and III of IPCC, respectively). I will look back the idea of parallel and integrated processes of the three research communities, that was attempted during the discussion of Representative Concentration Pathways (RCP) around 2010, from the present where IPCC AR5 was released, and discuss its progress and future prospects.