Regional scale impact assessment of water hazard in Shikoku based on RCM output

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Disaster management policies are important as climate change adaptation measures, and the national government is revising the Flood Control Law to raise standards. Local governments that implement disaster prevention policies to protect citizens are preparing for the largest rainfall in their regions. However, increases in the scale of rainfall due to climate change are not covered, and disaster prevention measures reflecting changes in disaster phenomena and their impacts are in the process.
In order to make disaster management policies as adaptation measures, it is necessary to predict the damage that climate change will cause. This requires the use of climate change projection models downscaled to the regional scale. Downscaled projection model output data should be combined with impact assessment models based on local disaster characteristics and disaster preparedness infrastructure.
We have been holding disaster prevention discussions with local government. Specific examples are shown.
In Sameura Dam, which is the key to flood control and water utilization of the Yoshino-River system, droughts and large-scale floods have repeatedly occurred. Sameura Dam is being reformed to include an additional drainage channel to increase the flood control capacity and operation rule will be reviewed. Although the d4PDF is highly reproducible, April-September when dams are useful for both flood control and water utilization, monthly rainfall does not match the absolute value. Then, the bias correction of monthly rainfall was carried out, and the water storage volume of the dam was estimated simply by comparing with the estimated monthly rainfall necessary to maintain the water level. By comparing changes in dam water storage volume in the present climate reproduction and the future projection of d4PDF, quantitative changes in drought risk were evaluated, and dam water storage volume in the event of large-scale flooding were estimated, and future dam operation was analyzed.
The data scale of d4PDF are so large that it is difficult for dam managers and local governments, who do not have computer resources and are not researchers, to conduct impact assessments. However, by providing bias-corrected monthly rainfall data, it was shown that the impact assessment could be performed according to regional characteristics.
The Kochi plain faces the risk of complex disasters such as flood from mountainous areas, inland flooding in urban areas, and the storm surge. But it is known as a rule of thumb that there is no simultaneous occurrence of a large storm surge and a unique rainfall event leading to a massive flood.
We analyzed complex disaster would be transformed in climate change. In SI-CAT 5 km RCM, the height of storm surge was estimated for flood events of more than 700 m3/s in Kagami River. At present, in the case of a large-scale flood, no storm surge occurs, and in the case of a storm surge, floods are limited to a small scale, so it can be said that the past phenomena are well reproduced.
Future projections show this trend, but it has changed so that medium-scale floods and storm surges occur simultaneously. It was also suggested that there is a low possibility of damage to existing river facilities, but it may affect the removal of inland flood.
In the future, if it is possible to extract cases of torrential rains and typhoons by searching the database, it will be possible for local government to conduct impact assessments by combining with models of past disaster prevention infrastructure development plans.
As described above, in order to make disaster prevention policies as adaptation measures, it is necessary

to conduct impact assessments that focus not only on qualitative trends of increasing flood risks but also on the disaster characteristics and infrastructure of each region. The usefulness of the database was also clarified.

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