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Market Base Solutions for Climate Change

- Role of Insurance for Adaptation -

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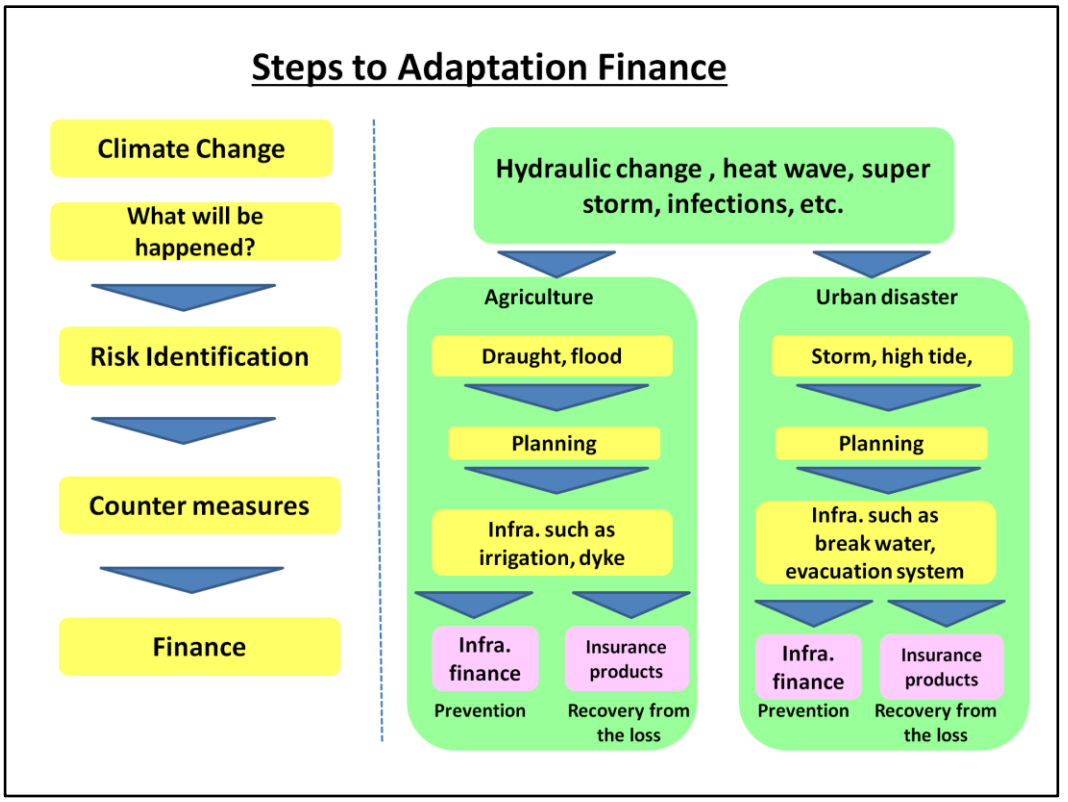
Mr. Takashi Hongo is a Senior Fellow at Mitsui Global Strategic Studies Institute(MGSSI). Before joining MGSSI, he served for Japan Bank for International cooperation (JBIC). He led the drafting the Environment Guideline for JBIC's financing which was renowned as the most advance and practical environment guideline for the public finance. And also he initiated various carbon related financial instruments such the "GREEN + J-MRV" by using these experiences. Recently he focused harmonization of the decentralized Asian Carbon Market including Bilateral Carbon Offset Mechanism (BOCM) and reforms of the financing for the low carbon economy using MRV such as Performance Base Incentive Scheme. He has knowledge contribution for International Energy Agency (IEA), International Renewable Agency (IRENA), IPCC, UNEP and UNEP FI, OECD, ICAO, GLOBE International, ADB and APEC in addition to Japanese government and local authorities through various committees.

This article focus on the role of insurance products to support the recovery from the damage caused by extremely weather under climate change. This introduces WIIA (Weather Index Insurance for Agriculture) and a commercial base pilot projects in Thailand by Sonpo-Japan under the cooperation of BAAC in Thailand (BAAC) and JBIC in Japan. Hongo initiated the study and support the development of WIIA.
WIIA can not prevent or reduce the disaster by climate change but can reduce the economic damage and support the recovery from the disaster. WIIA is effective but should combine with disaster prevention measures such as infrastructure.

Also this article play up the role of planning for preventing and mitigating climate change risk. Well designed plan will reduce the cost of adaptation and urge the private to avoid or minimize climate change risk. Science, particularly satellite observation, may help to reduce the cost of adaptation and support the development adaptation financial products.



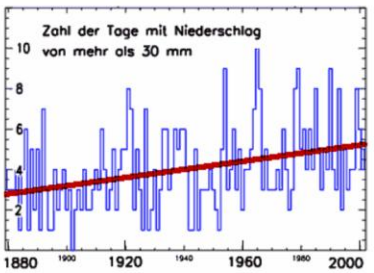
When we consider the finance mechanism for adaption, we have to know what kind finance demand is there first. Demand for finance comes form counter measures and counter measures are prepared when risks are identified. This means the first thing we have to do is to know what will be happened by climate change and identify the risk to be prevented and mitigated.

Various types of change such as hydraulic change, extremely strong storm, and heat wave, would be caused by the climate change. We had better to focus on agriculture and urban weather disaster as major risks on our economy and life. Adaptation plan is very crucial for risk management. Counter measures consists of two approaches, say prevention of disaster and recovery from the damage. Prevention by infrastructure is essential but we can not prevent extremely large scale events. We learnt the limitation of infrastructure from the Great East Earthquake in Japan. Hard infrastructure such as long and high break water reduced the impact but it could not prevent all impact and we understand soft infrastructure including evacuation system and evacuation drill were effective.

A practical is firstly we should assume the magnitude and frequencies of disaster and set counter measures which are the combination of hard infrastructure for preventing and mitigating disaster and soft infrastructure including evacuation from the disaster and recovery from the economic damage.

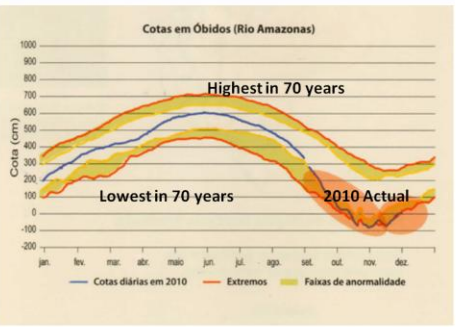
Climate Change Impact on Hydraulic Cycle : Precipitation

Germany



Source: Wetterstation Hohenpeißenberg

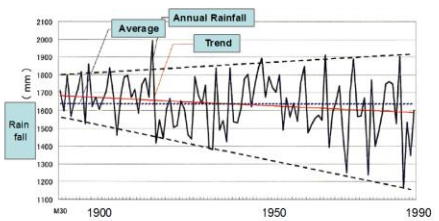
Amazon River



Source : Agencia Nacional del Aguas (Brazil)

Japan

Changing Pattern of Annual Rainfall in Japan



Source : Prof.Koike, Tokyo Univ.
At JBIC seminar

Gap between "rain" and "drought" are widening

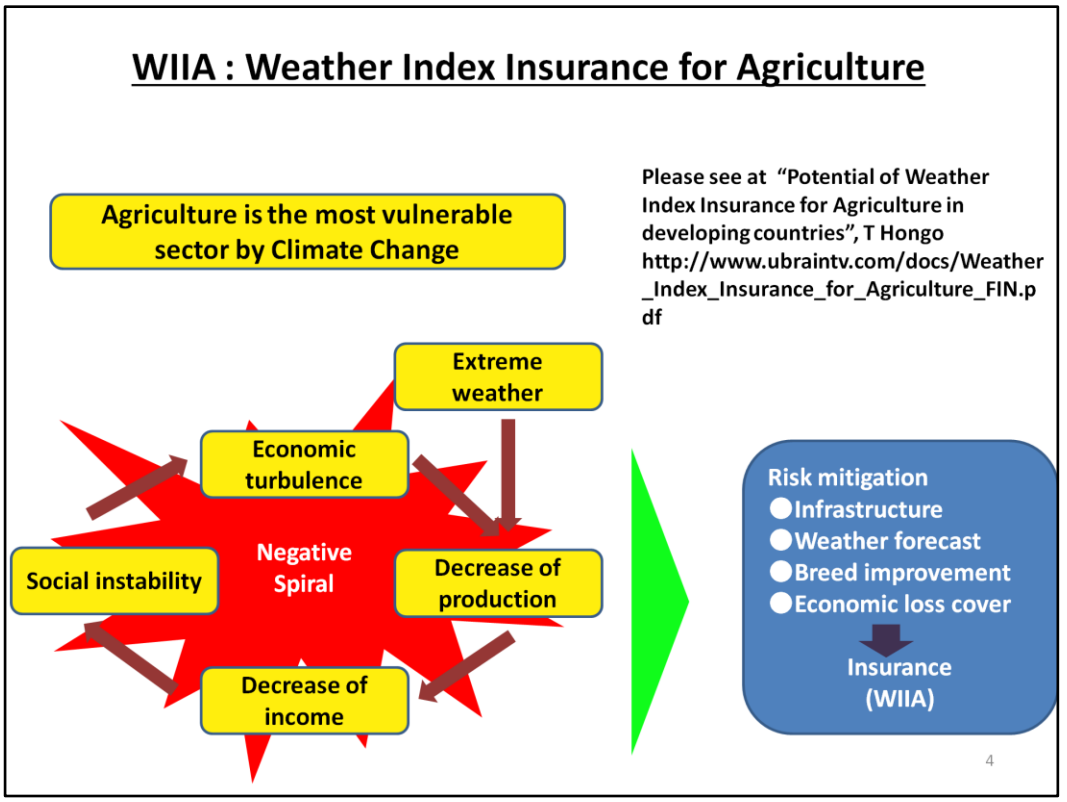
Serious impact on agriculture

3

Climate change typically provide impacts on hydraulic cycle.

In Germany, annual precipitation is in the upward trend and in Japan it is slightly in the downward trend but its amplitude by year is explicitly expanding. Water level in Amazon River has an annual cycle but at the dry season in 2010 water level was recorded as the lowest in 70 years observation history. It is said that water level of Mekong River at the dry season becomes lower than before.

Agriculture sector is very fragile by the change of hydraulic cycle and we should pay attention on its impact.



Weather Index Insurance for Agriculture (WIIA) supports the quick recovery from the economic damage in agriculture by extremely weather but it is not the measures to prevent the drop of agricultural product.

Agriculture sector is very fragile to the change of weather and, generally speaking, prevention measures like irrigation and flood management have not well prepared in developing country. Economy of developing countries , particularly in the rural area, depends on agriculture and the drop of the production provides serious impact on local economy. Once such extremely weather continue a few years, economic damage cause social instability and it will provide negative impact on agriculture system. This is negative spiral caused by climate change. WIIA may cut this spiral and keep the agriculture economy and its related social system.

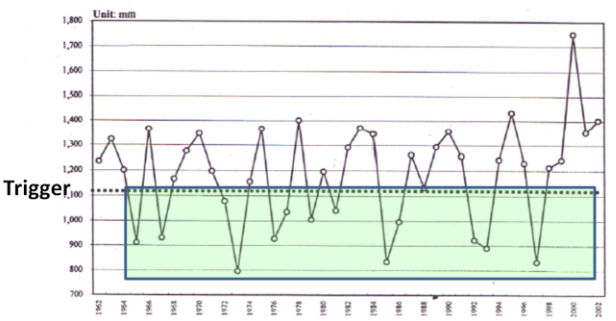
Insurance may cover many different loss including property, ships and cargos, and sales and production. When covered accident occurs, insurance will pay after the confirmation of the accident. Insurance policy holders shall claim and then investigator asses the accidents and damages. However, its assessment is a big burden in case of agricultural loss because extremely weather provide impacts on big number of policy holders once event occurs. Index, for instance, amount of precipitation, could be a trigger to make insurance payment. By the index base insurance, policy holder may receive payment quickly and prepare for the next cultivation.

Case Study : WIIA in Thailand by Sonpo Japan Insurance

Why Khon Caen?

- ✓ Highly dependence on agriculture
- ✓ Depend on natural water supply
- ✓ Availability of weather and agriculture data
- ✓ Local partnership

Figure 1.1: Long-term Trend of Annual Rainfall in Khon Kaen, 1962-2002

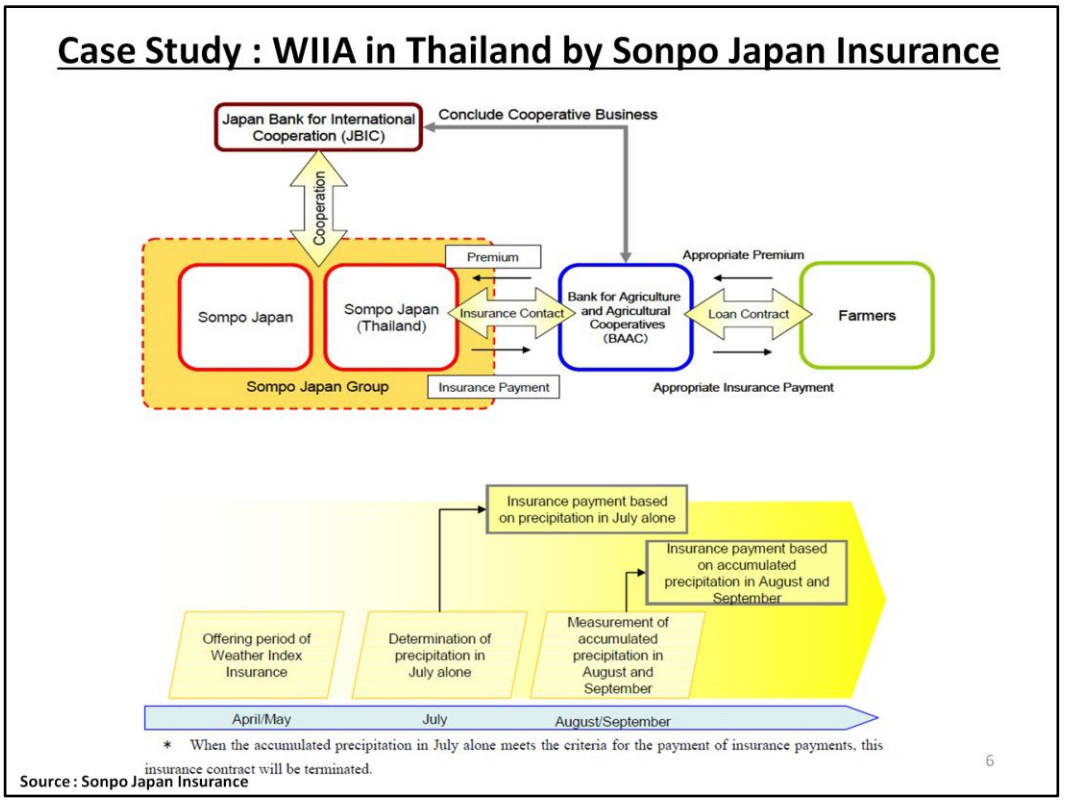


Source Data are from the Khon Kaen Meteorological Station.

Source : JBIC report

Thailand is a leading exporters of rice. Around 80% of rice is harvested on October and November and its production depends on the rain during summer. When rain fall in July and August is short, production amount is likely to be decreased so much. As we observed, rain fall pattern is changing and frequency of heavy rain and drought is increasing.

Sonpo-Japan started the first commercial base pilot WIIA in 2010 in Kohn Cane, where is located in East Northern area and famous as a rice cultivation area. WIIA is contracted by farmers and the decrease of income of policy holders will be compensated by WIIA. Trigger for payment is amount of rain fall in June and August because it was observed that production amount has high co-relation to the rain in these 2 months. Monitoring points of rain fall are located within the area and disclosed. If rain fall is below the thresholds (trigger), insurance will pay to insurance policy holders automatically and no individual assessment are needed. Its payment is quicker and more transparent than the assessment base insurance.



WIIA is marketing and implementing jointly by Sonpo-Japan and Bank for Agriculture and Agricultural Cooperation (BAAC) of Thailand.

Sonpo-Japan is a developer of insurance products and undertake the insurance payment as well. They participated a study group organized by Japan Bank for International Cooperation (JBIC) and decided to develop WIIA based on the study outcome.

BAAC have cooperation agreement with JBIC for the supporting the development of WIIA by providing information of production, co-relationship of production and rain, arranging the weather database etc. Now they sell insurance products to farmers together with agricultural loans.

Farmers borrow loans in spring and make repayment after harvest even though its harvest are not good by the short of rain fall. If they buy insurance products, loss of the income caused by short rail fall in summer are compensated. It looks like “waiver of a part of repayment when production are damaged”.

Detail of insurance and payment condition are improved every year in order to meet the demand from farmers.

Case Study : WIIA in Thailand by Sonpo Japan Insurance

Measurement of precipitation

Source : JBIC report

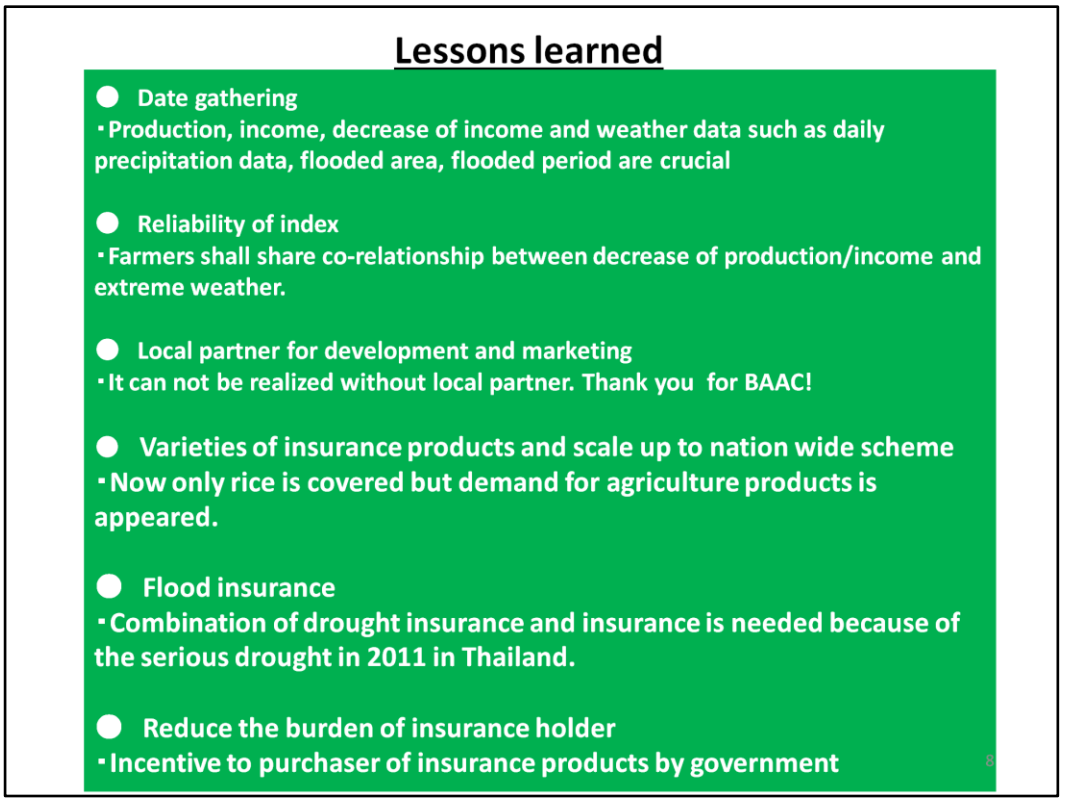
Insurance payment briefing

Source : Sompo Japan Insurance

Insurance products, particularly in agriculture sector, has not been widely used.

One of the barriers for the development is in-sufficient data, including weather data and production and income. However, Kohn Cane has long history to observe weather condition and access to these data are supported by BAAC. BAAC is a prestigious public bank in Thailand and their support was very effective.

Other barrier is reputation of the products. As noted above, farmers are not familiar with agricultural insurance. One of the reasons why this product is used well is an alliance with BAAC. BAAC and Sonpo Japan co-work for introduction of WIIA. Many explanatory meetings were held.

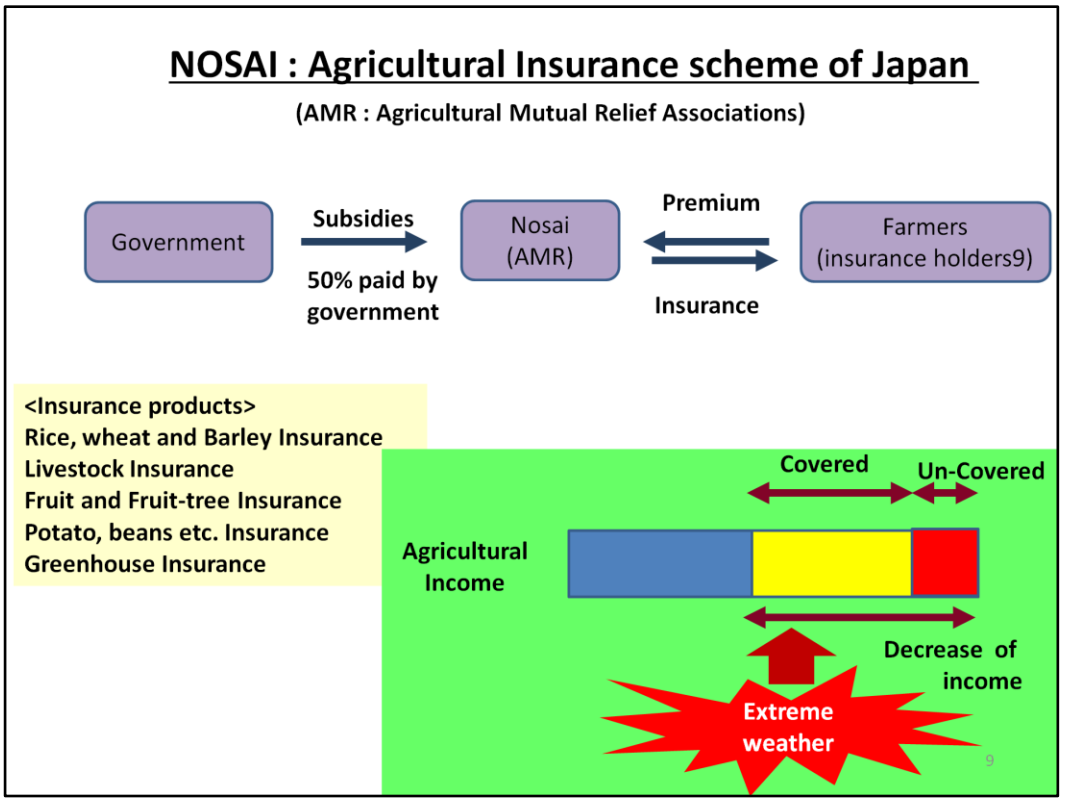


Lots of lessons we learnt from this commercial base pilot projects. But the most important one is “Not theory, but action”.

It is very clear that WIIA has a great potential to mitigate the economic damage by climate change. But still it is developing phase and public and international support such as data gathering and cost reduction are needed. If a half of insurance premium would be funded by the government, cost for insurance policy holder is going to be reduced and used more.

When WIIA is globally used, then risk of taking insurance may be over the capacity of single insurance company. International re-insurance is available but climate change risk may be much bigger. International mechanism which undertake the risk should be set up in the future.

WIIA is very practical and can reduce the total cost for adaptation. However, we have to remind that WIIA aims to reduce the economic damage by extremely weather and can not prevent the disaster itself.



WIIA is a private driven safety net system for climate change measures.

Public base safety net system is implementing too. An example is Nosai in Japan. Nosai is a government base implementation system to mitigate the loss and damage at agricultural production, livestock, equipments like green house. This is a risk haring scheme with government and farmers.

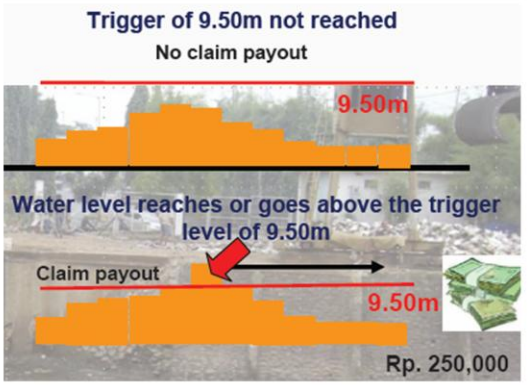
✓Decrease of income are compensated by Nosai but not 100%.

✓Premium is subsidized by the government.

WIIA and Nosai can be used for effective and efficient risk mitigation measures for agriculture under climate change.

Flood insurance by GIZ : Jakarta

Source : GTZ

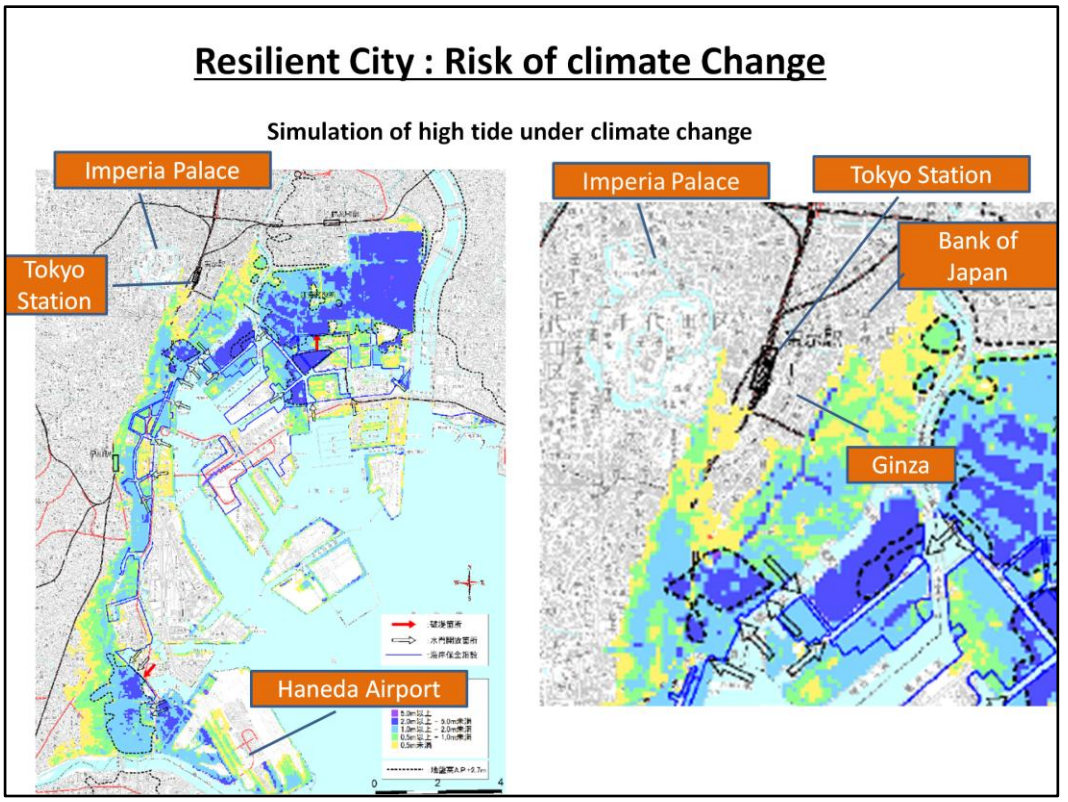


City is fragile under climate change too. Flood and high tide is typical risk in the megacity in Asia because most of megacity are located along coast line or big river and newly developed area at these megacities are rather low land where is not a best place for commercial and residential area. One of the reason why these area were used is they are less expensive area in terms of land acquisition.

A pilot project were implemented by GiZ of Germany. It covers flood risk at lower area in Jakarta City, Indonesia. This is index base insurance too and its trigger is water level of the river, say if the water level at the observation point is higher than 9.5m, then policy holders may receive payment without assessment. Many of the people lived there are not familiar with insurance products and does not know the detail of insurance conditions well so they adopt card style in stead of written contract. People who would like to use flood insurance buy a insurance card (max 2 cards per family) which show the payment amount and trigger of the payment. They show it when water level is over the trigger. Access to the flood insurance is quite unique.

However, this pilot program has not been developed to commercial one because frequency of flood is so high and same area are affected every year.

We learn the necessity of the combination of the hard infrastructure preventing flood.

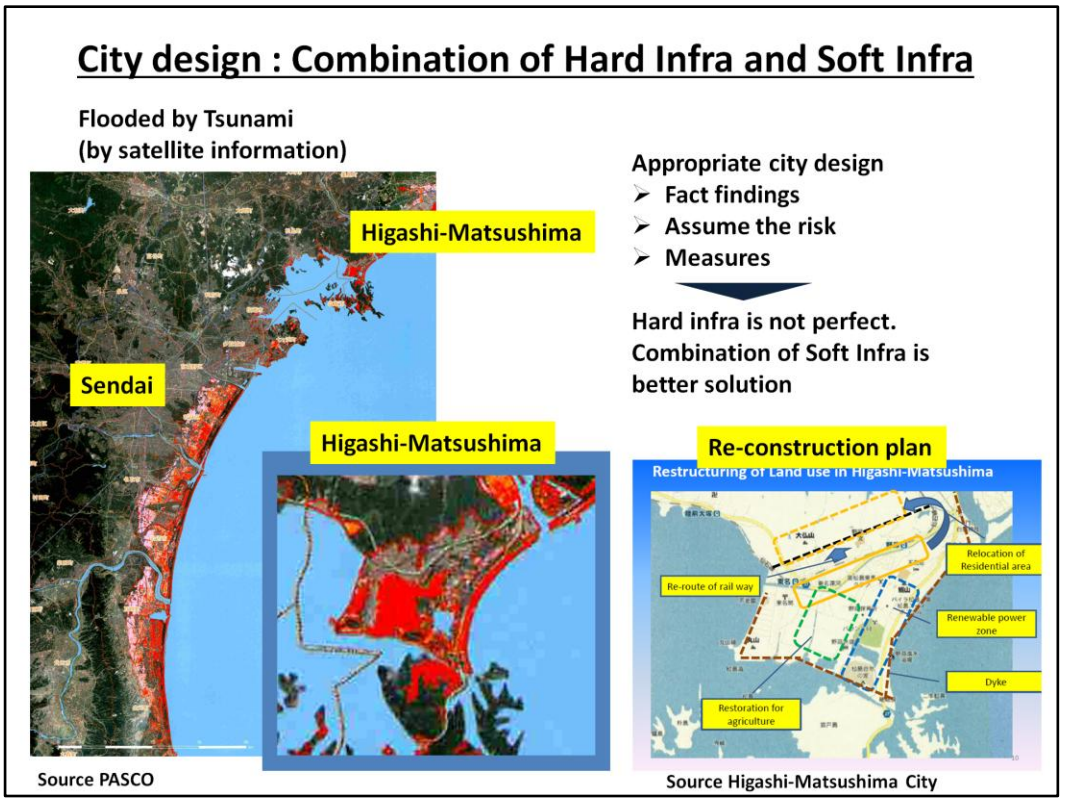


Combination of hard infrastructure, such as dyke, break water, irrigation system, for preventing disaster and insurance products as soft infrastructure for supporting the recovery from the disaster are practical manner for climate change adaptation. Government shall determine the frequency and magnitude of disaster, as their assumption, for the prevention and mitigation.

The fist step for constructing counter measures for the urban disaster is the identification of risk, such as flood, high tide and heat wave. Once we assume the risk, we should proceed to planning phase. Hazard map is a basement of counter measures. It takes time to construct hard and soft infrastructure for preventing and mitigating climate change risk therefore people who live and work there should know what risk is, how big it is, and how often it comes to save by themselves.

Also this is useful to avoid unsustainable development of city and industry area. Generally speaking, private investors try to review all potential risk before investment decision making to avoid the loss of investment. However, information of climate change risk is limited and miss decision may be made.

Above is the study of the climate change risk in Tokyo. A Japanese government study group disclosed several scenario about inundation of central Tokyo when one time 50 years typhoon come to Tokyo bay after sea level rise. High tide will come near to imperial palace and Tokyo station and many subway station will be inundated.



Hazard map is an indispensable instrument for planning and investment but it seems taking time and being costly for preparing. One of the fast track to prepare it is using satellite technology.

Satellite can observe wide area at the same time and preciseness of its data is improving year-by-year. It may distinguish the small items, such as less than 1m and precisely calculate the height of ground. Cost of satellite lunching is still expensive but reducing by the international competition. Now small satellite becomes a new market too. Export finance (as a public finance) is available and a kind of regional cooperation to share the satellite is possible.

Left side photos are by satellite after the Great East Earthquake. Red area were inundated by Tsunami and zoomed up the Higashi-Mastushima City. Coast line area and ex-bay area were inundated. After the disaster the city draw a city reconstructing plan with zoning including removing the residential and commercial area from lowland to hillside. Satellite observation shows the high risk area clearly.

Planning is very crucial for reducing the burden of climate change adaption and it make the additional cost of adaptation clearly.

Conclusion

- **The first step for Adaptation finance is to identify the risk and then to prepare planning for prevention and mitigation against disaster.**
- **Insurance products are useful to speed up the recovery from the disaster More support from public and international group is expected.**
- **All investment including private investment contains adaptation factor. To show the climate change risk, for instance, by hazard map, is crucial for reducing the adaptation cost.**
- **Don't miss the potential of science like satellite technology**

For more information ;

"Reforms of Financing" by Takashi Hongo
http://www.ubraintv.com/watch.php?id=569
http://www.ubraintv.com/docs/Weather_Index_Insurance_for_Agriculture_FIN.pdf

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