The Contribution of Science and Technology to Disaster Risk Reduction -What should we learn from the past experiences?

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Events in 2015 on Environment and Disaster

“The 3rd UN World Conference on Disaster Risk Reduction” held in Sendai, Japan, in March, adopting Sendai Framework for Disaster Risk Resuction(SFDRR).

SDGs Adoption in the UN General Assembly, in September

COP 21 in Paris from the end of this month.

SDGs

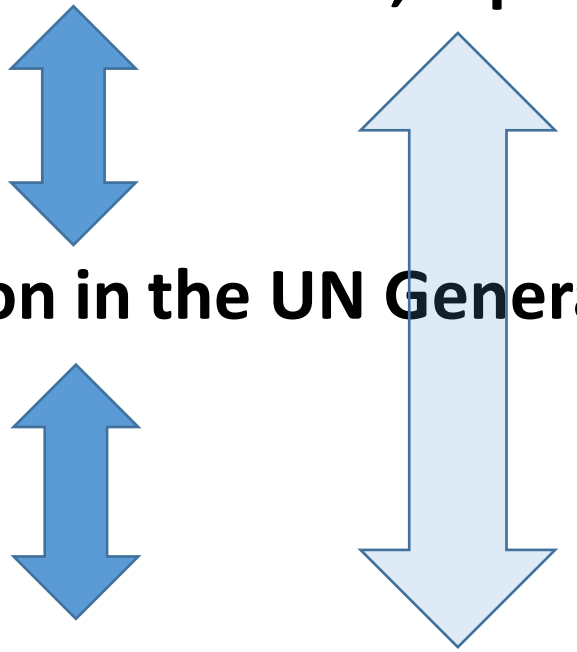
11. make cities and human settlements inclusive, safe, resilient and sustainable

11.5 By 2030, significantly reduce the number of deaths and the number of people affected and substantially decrease the direct economic losses relative to global gross domestic product caused by disasters, including water-related disasters, with a focus on protecting the poor and people in vulnerable situations

11.b By 2020, substantially increase the number of cities and human settlements adopting and implementing integrated policies and plans towards inclusion, resource efficiency, mitigation and adaptation to climate change, resilience to disasters, and develop and implement, in line with the Sendai Framework for Disaster Risk Reduction 2015-2030, holistic disaster risk management at all levels

Events in 2015 on Environment and Disaster

“The 3rd UN World Conference on Disaster Risk Reduction” held in Sendai, Japan, in March



SDGs Adoption in the UN General Assembly, in September

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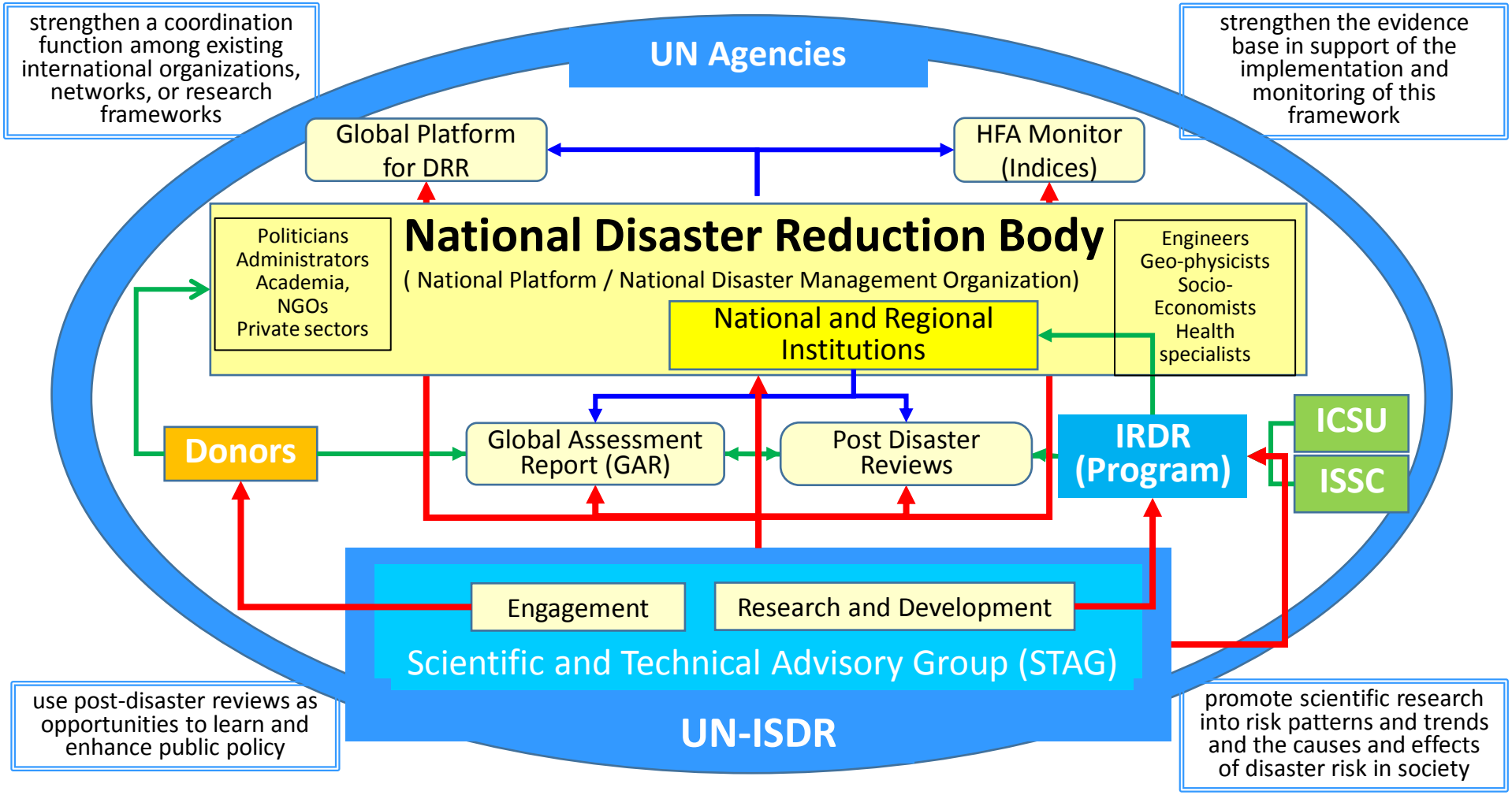
Tokyo Conference on International Study for Disaster Risk Reduction and Resilience

Tokyo Statement
-Towards a new science and technology to consolidate disaster risk reduction and sustainable development-

1. Our assessment of the present status
2. Our key directions for addressing problems through solidarity towards building resilience
3. Our findings and recommendation
4. Our proposals for concrete initiatives to be taken in cooperation with national and international stakeholders

New Approach to Strengthen and Support Decision-making on DRR



Enhancing the scientific and technical work on disaster risk reduction through the mobilization of existing networks of scientific and research institutions at national, regional and international levels.

4＋2, Tokyo Statement

(functions)

- **Assessment** of current state of data availability and scientific knowledge on disaster risk and resilience.
- **Synthesis** of scientific evidence.
- **Scientific advice** to decision-makers.
- **Monitoring and review.**

(cross cutting)

- **Communication and engagement** of poicy-makers and stakeholders
- **Capacity develoment**

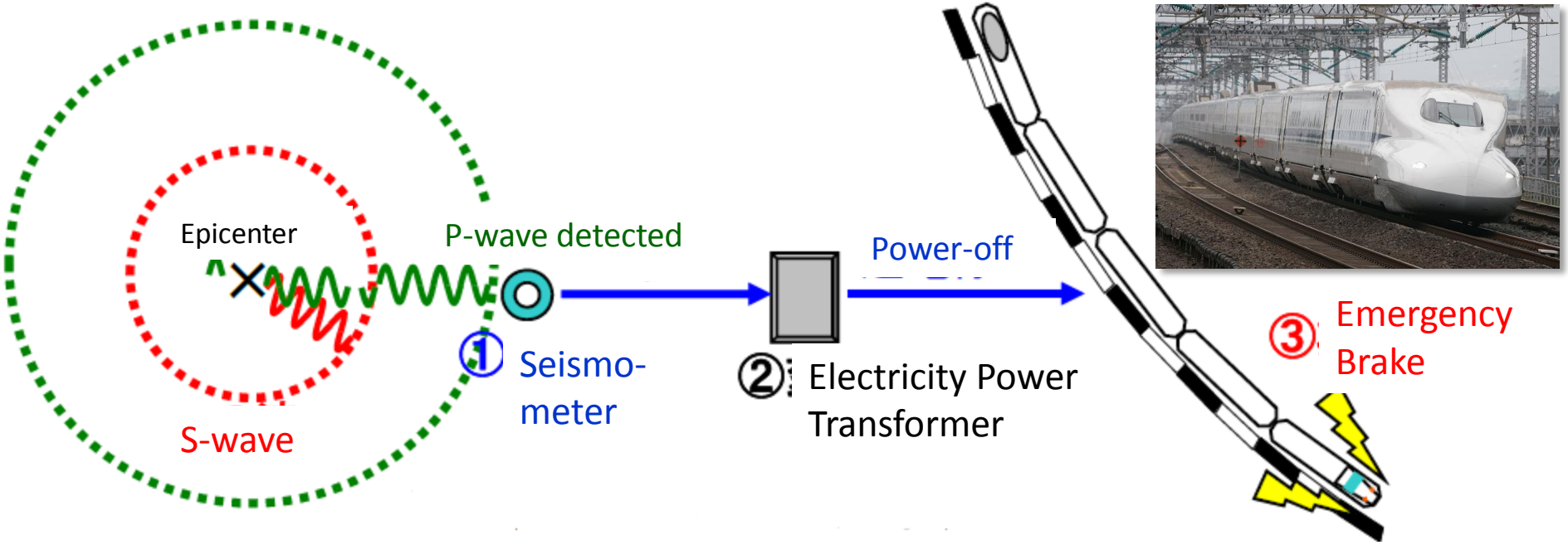
Applying Science and technology for Disaster Risk Reduction.

- SFDRR stresses ST is important for DRR.
- We have many examples in which ST played important roles for DRR.
- ST has its shadows as well.

Example 1: ICT and new technology saved Shinkansen in March 11, 2011.

Tohoku Shinkansen (Bullet Train) immediately stopped by primary-wave sensors located along the coastline.

No derailment, No fatalities, No injuries.



27 Shinkansen were in service between Tokyo and Shin-Aomori.
2 Shinkansen were running at maximum speed 270km/h near Sendai.
P-wave detected, electricity immediately cut off, 9-12 seconds before the first S-wave.
Emergency brake. Maximum S-wave reached 70 seconds after the first detection, Shinkansen was already slowed down below 100km/h. Safe Stop!

Example 2: Toni-hongo, after the disaster

Example 2: Toro, Seawall

Tsunami hit Japan - Miyako City, Iwate Prefecture -

Tsunami easily surmounted the Great Seawall.

Photo originally provided by Taro-cho Fishery Cooperative;
Courtesy of Cabinet Office, Government of Japan

Lessons from the disaster

- Disasters can be beyond assumption
- From disaster prevention planning to disaster reduction planning.
- Disasters cannot be prevented by man-made facilities, such as water breaks or sea walls.
  - The combination of disaster prevention facilities, town and village planning and evacuation facilities is most important
  - People's life must be saved, and the properties are protected as much as possible.
- The disaster reduction planning should be applied to the recovery plans of damaged areas and the preventive plans of areas where large scale natural disasters are expected.

Lessons from The East Japan to the West Japan

Example 3: Tsunami Evacuation Tower in the farmland

Example 3: Two story building with roof area cost 2 million dollars.

Example 3: The location of tsunami evacuation buildings

Fukushima in Sever Situation

- **80 thousand people are still away from their hometowns due to high radiation level.**
- **Therefore, it takes a long time for all the affected areas to be recovered.**
- **A long-term reconstruction plan was designed for Fukushima, appling the backcasting method.**
- **Through this accident, we recognize that the technology we create brings about huge risks to us. Therefore, we have to apply those technology carefully and sometimes have to determine not to use the technology because we can’t control it.**
- **The Government of Japan expressed to seek for the future without nucear plant. Therefore, SCJ considers it is most important as energy policies to accelerate the supply of renewable energy with enough amount and in stable manner.**

Conclusion

- **Science and technology can play very important roles to reduce disaster risks.**
- **It is also important to reduce disaster risks caused by global environmental changes.**
- **However, we have to know the disaster risks increased by the development of science and technology.**
- **Therefore, some of the science and technology should be refrained from the application.**