Japan's international cooperation for a carbon neutral world

Supporting leapfrog development in natural resource-dependent developing countries

Expectations for leapfrog development

Developing countries as key to a transition to carbon neutrality. With the Paris Agreement, the world reached a consensus on a global transition to carbon neutrality, requiring prompt and substantial reduction of greenhouse gases (GHGs). However, even if emissions reductions by countries currently submitted as Nationally Determined Contributions (NDCs) to the secretariat of the United Nations Framework Convention on Climate Change (UNFCCC) are added up, they do not put the world on a course that allows transition before the end of this century. Toward realising carbon neutral societies, many developed countries are in the process of submitting long-term strategies aiming in the vicinity of 80% reductions by 2050, and the advancement of genuine reductions is expected. Meanwhile, business-as-usual emissions from developing countries, where population increase and economic development are predicted to continue, are expected to exceed the emissions of developed countries by several-fold, making climate stabilisation without emissions reductions by developing countries problematic.

Climate policy in the context of development. Most developing countries have pursued development patterns based on mass consumption of fossil fuel energies, in a similar manner as industrialised countries to date. As such, developing countries seem to be at a loss as to how to make the switchover to carbon neutral development. Large-scale energy use is indispensable to the type of development on which developing countries have set their sights. Priority issues are: securing of energy sources and its expanded use; improved energy access for the poor; and clean energy conversion. The low-carbon transition requirement added on by the Paris Agreement will have major impacts on such energy policies to date. In order to comply with the Paris Agreement, developing countries must adjust their development paths and recreate appropriate energy use and supply technology systems suited to their respective development stages, energy availability and regional environments.

Leapfrog development is essential. At the dawning of a carbon neutral world, societies in all countries will function in harmony with nature based on renewable energies and natural carbon absorption, although circumstances will differ in each country. In Asia, China is preceding "developed nations" in its switch to post-carbon development patterns, while emerging nations in the height of industrial development, such as Thailand, Indonesia, Malaysia and Viet Nam, are exploring transitions that capitalise on natural resources while reducing dependence on fossil fuels. Meanwhile, countries that remain at the very beginning stages of development cannot retrace the footsteps of developed nations and fossil energy-based development, but must search for new development pathways. Some of these countries already have a base in place for a carbon neutral society. They are blessed with natural resources, and the majority of energy is supplied by biomass and hydropower. Thus, they need not pass through fossil energy dependence, but are capable of finding paths to leapfrog directly to carbon neutral societies.

Not only is the leapfrog development of these countries desirable for the entire world, it also offers good suggestions to countries that are rich in natural resources and have undergone industrialisation dependent on fossil fuels. The extent to which developing countries can leapfrog to carbon neutral development holds the key to climate stabilisation.

A new approach in development cooperation for carbon neutrality. While promotion of cooperation (support) between developed and developing countries is established in the Paris Agreement, developed country support for the carbon neutral development of developing countries from here on cannot be a mere shift from the successes in fossil fuel-dependent development to date. Support based on new concepts must be envisioned.

Focusing support on renewable energy use and maintenance and enhancement of absorption capacity. As the carbon neutrality goal was established in the Paris Agreement, ultimately renewable energies must become the major energy source relied upon in all countries of the world. Moreover, carbon neutrality requires not only suppression of carbon dioxide emissions. Also important are the maintenance and expansion of carbon sinks–forests, soil and oceans–and appropriate ways of managing national and local land use to protect these natural resources must be highlighted.

Proper assessment of absorption capacity is required. Global efforts to suppress fossil fuels are assessed in terms of carbon price, extending to trading in the emission credit market. In contrast, while there have been individual measures within REDD+ to examine maintenance of absorption capacity, proper assessment has not been established, mainly due to insufficient scientific data. For this reason, incentives for developing countries to maintain their absorption capacities are not effective, and concerns have risen that natural resources will continue to slowly deteriorate. International debate must be hastened.

Appropriate technology, capacity building and mutual learning. A carbon neutral society is built upon renewable energies as a main energy source. Technologies for the provision and use of renewable energies are fundamentally decentralised, small-scale, adaptable to regional characteristics and community-managed, differing in characteristics from the technologies advanced by developed countries that are centralised, large-scale, standardised and expert-managed. Enhancing access to appropriate technologies that are suited to the differing circumstances of regional conditions and resource availability, simultaneously with capacity building to secure the human resources in local locations, is required. In a carbon neutral age, the appropriate technologies in developing countries may in some cases become leading-edge, resulting in mutual learning based not only on one-way technology transfer from advanced nations, but also enabling learning from developing countries.

Emphasising the development context. For most natural resource-dependent developing countries, future development is the foremost goal. Energy is the driving force behind development in all areas, including housing, livelihoods, industry and transportation. As such, carbon neutrality must be balanced with national development goals and incorporated into development paths or designed together with development plans. Leapfrog development cannot rely solely on the transfer of technologies and knowledge from developed countries. Rather, countries must create policies on their own suited to their own respective circumstances. To do so, capacity building with a long-term view from human, organisational and institutional perspectives is essential. Also essential are development and diffusion of appropriate technologies, those suited to respective environments based on the size of a country' s economy, population and resources, as well as differences in technologies, finance, business, policy and actors.

Creating a forum for South-South (S-S) cooperation. South-South cooperation between countries that share a broad range of backgrounds and concerns has tremendous potential. Opportunities and venues for knowledge-sharing in the areas of designing development pathways and formulation, implementation and assessment of strategies, as well as capacity-building, potential markets and risks, based on joint research and mutual learning, must be further promoted both regionally and globally.

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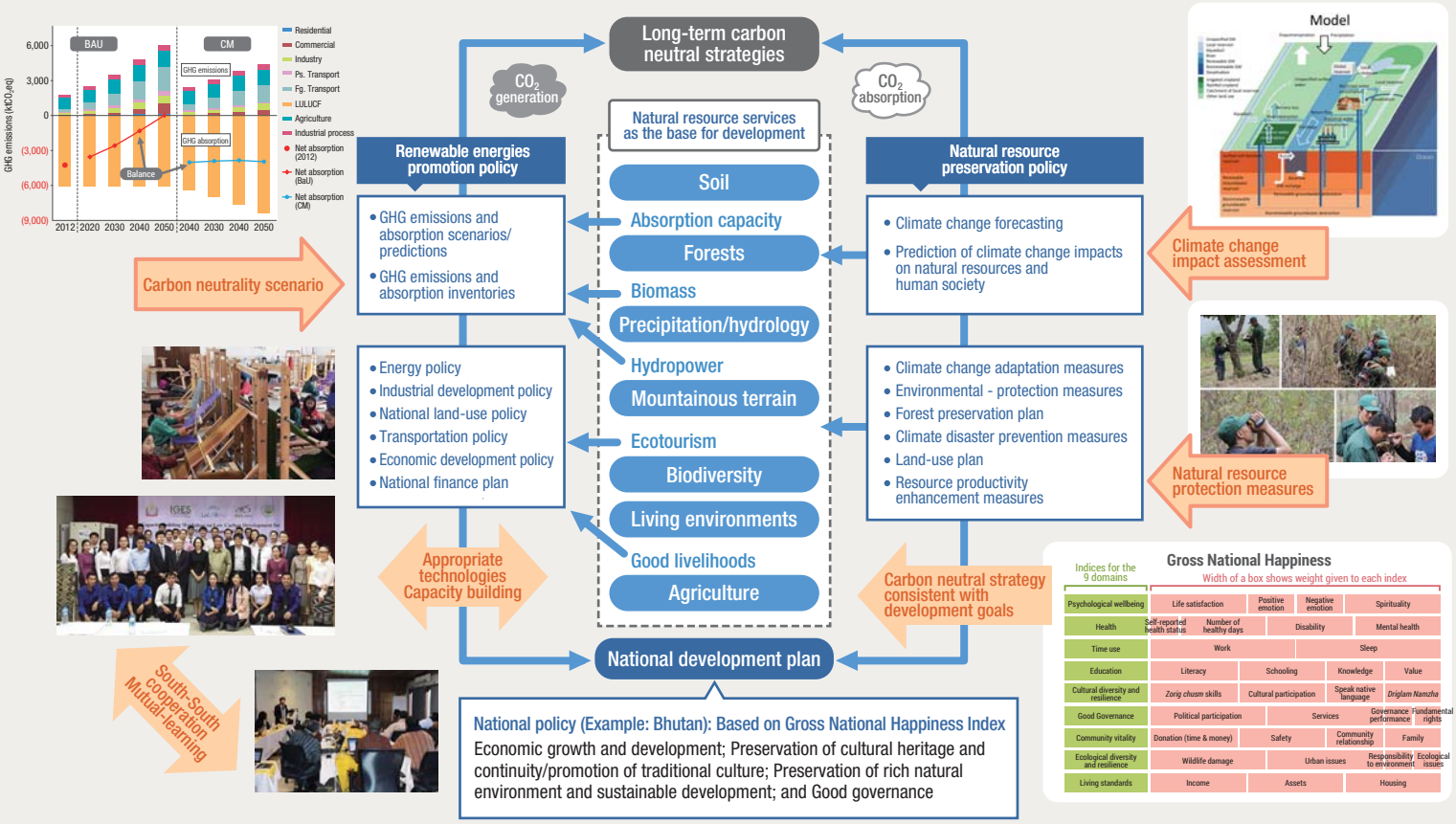
Support for leapfrog development in natural resource-dependent developing countries



The following research is required on carbon neutral development policy.

1. Recognition of current situation of countries' natural resources that are central to carbon neutrality and ascertainment of climate change impacts
2. Climate change adaptation policies and long-term land-use planning for protection of natural resources
3. Industrial policies and appropriate technologies to enable leapfrog development
4. Long-term strategies for creation and implementation of carbon neutral scenarios consistent with development plans

Joint research, capacity building, mutual learning based on South-South cooperation and international cooperation are essential.

This project is part of Japan's international cooperation to achieve carbon neutral development through research activities in cooperation with Asia's natural resource-dependent nations

A first for modern society. Creating a carbon neutral society based on the leapfrog approach is uncharted territory–a challenge that has yet to be experienced in modern society. It would require an instantaneous switch in the source of our energy, the lifeblood of all activities in modern society, from fossil fuels to renewable energies, and the harnessing of the full power of nature to absorb carbon dioxide to stave off climate change. This venture into the unknown requires concentration of the world's vast knowledge and wisdom. When it comes to coexisting with and utilising nature, today's industrialised nations are not necessarily "advanced". On the contrary, countries that have ingeniously made use of natural resources in the past could be considered "advanced", and many of them have already built the carbon neutral societies that industrialised nations now aim to achieve. However, in order to maintain these societies, sufficient grounding in scientific knowledge related to climate change and carbon neutral societies is required. Meanwhile, knowledge on the scientific technologies and policies for a carbon neutral transition in industrialised nations is indispensable to future policy formulation in these countries. The developing country support established in the Paris Agreement should take place based on mutual learning of such knowledge.

Research-related approach. The Low Carbon Asia Research Network (LoCARNet), launched based on a proposal by Japan at an ASEAN+3 Environment Ministers Meeting in 2011, has to date leaned towards knowledge exchanges on climate change mitigation research topics, focused mainly on reducing fossil energies based on industrialised nation development patterns. However, from here on, attention must be shifted to knowledge sharing and collaboration for policy support to realise a "carbon neutral Asia" based on reducing emissions and expanding absorption. At this time, the range targeted by the network is to be expanded to encompass expansion of carbon sinks and land-use policy. Further, as climate change impacts the natural resources that yield hydropower, biomass and absorption capacity, the network should also include adaptation measures.

Bhutan as a model for leapfrog development. This project has involved research over a three-year period on the feasibility of carbon neutral development in Bhutan, an exemplary carbon neutral (in fact, a carbon-negative) nation in Asia, in cooperation with the National Environment Commission of Bhutan. Hydropower and biomass account for most of Bhutan's energy, and absorption is ensured by preservation of rich forests and soil. The country also carries out an advanced form of governance based on appraisal of policies and budgets according to high-level targets in the Gross National Happiness (GNH) Index. Bhutan's carbon neutrality policy combined with its development plan are a good example for many developing countries to work toward leapfrog development.

Promotion of South-South cooperation. In order to expand knowledge and appropriate technologies for leapfrog development in cooperation with Asian nations, this project held a trilateral workshop in November 2018 for Lao PDR, Cambodia and Bhutan. Further, the outcomes of research in Bhutan have been disseminated worldwide, including a presentation in July 2018 at a meeting of low-carbon researchers from European nations.

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