

## **Indonesia's blue carbon**

Last May, 350 experts from around the world gathered in Manado, North Sulawesi, to participate at the International Blue Carbon Symposium (IBCS). Experts predict that in the next 20 years, most of the global blue carbon-absorbing ecosystems will have disappeared and their annual capability for carbon sequestration will also decrease. In order for this ecosystem to maintain its current carbon sequestration capability, there should be 4-8 percent carbon emission reduction by 2030, or 10 percent by 2050.

Ironically, these coastal habitats suffered have been degraded at a rate of approximately five to 10 times more than the damage found in tropical forests. Climate change is a global issue caused by increased levels of greenhouse gases due to burning of fossil fuels, carbon emissions from land clearing, forest fires as well as agricultural activities including livestock. It is also due to the reduced capability of natural ecosystems to absorb and store carbons through photosynthesis, known as green carbons.

There is also blue carbon, which is absorbed by marine and coastal ecosystems and covers more than 55 percent of the global green carbon. Blue carbon sinks include mangroves, marshes and sea grass, and they play a similar role to tropical rain forests, as biodiversity hot spots or centers of biodiversity, and as providers of high-capacity carbon sinks. Only a portion of the carbon sinks are permanently stored in this marine environment, while the large remainder will follow a recycle pattern and be released to the atmosphere over decades.

Currently, coastal ecosystem preserves carbon at a rate equivalent to approximately 25 percent annual increase in atmospheric carbon. The recovery of this blue carbon ecosystem will bring impacts to its ecosystem services, such as the increased dissolved oxygen level in coastal waters, the restoration of fish stocks and the improved protection of the coastal areas from extreme weather and storms. Indonesia is home to the coral triangle region, which accounts for 52 percent of the world's coral reefs, its mangroves cover approximately 3.15 million hectares, or 23 percent of the world's mangrove systems and are capable of absorbing 122.2 million tons of carbon per-year. Indonesia is also the site of 3.30 million hectares of sea grass, the world's largest, with a capability to absorb 16.11 million tons of carbon per year.

The degradation of this coastal habitat is often out of sight and also neglected due to its underwater location. In order to recover the blue carbon sink ecosystem, several steps must be taken. First, a blue carbon market-based climate policy mechanism should be introduced. This mechanism will bring carbon funds to the fore. Through the Nusantara Carbon Scheme, the carbon registration effort, verification and certification of carbon sink Indonesia may be ready to enter the carbon market for funding compensation. For example, the value of one ton of carbon in the carbon market varies between US\$5 and \$15. The Indonesian blue carbon potential is approximately 139 million tons per year and an average price of \$10 per ton, Indonesia may accumulate \$1.39 billion annually from blue carbon trading alone.

Second, adopt an effective management system to protect at least 80 percent of the existing sea grass, brackish marshes and mangrove forests.

Third, introduce the capacity development and training programs on blue carbon ecosystems in order to reduce destruction and to support the recovery of blue carbon absorption capability.

Fourth, ensure food security and livelihoods based on integrated ecosystem approach to prepare people living in the coastal areas ready for adaptation due to natural system changes.

The above mentioned steps should be taken seriously considering the impact has begun to occur in the marine environment due to climate change, i.e. sea level rise, ocean acidification, increased frequency, intensity of extreme weather and decline in fisheries resources. Indonesia is an archipelago with its blue carbon potential of absorbing 139.77 million tons of carbon per year. This number may continue to expand through the planting of mangroves in the barren coastal areas. The Indonesian coastal communities should gain the most benefit from this endeavor.

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