Burning an ecological treasure to extinction

Kim H. Tan, Athens, US | Opinion | Wed, November 19 2014, 11:02 AM

Peat, gambut in Indonesian, is a unique ecosystem treasure of the country and takes millions of years for Mother Nature to form – yet it is being threatened with extinction within just a couple of years. The usually thick and dense peat forests, presenting a dangerous and mysterious environment, remained undisturbed for years and years.

Obviously, the seemingly treacherous environment, together with known health risks such as malaria, have discouraged people from opening the forests for use as ladang or rice fields. However, the discovery of fossil fuel (oil) during the Dutch colonial era shattered the mystique of the peat forest, providing an initiative for clearing the forests.

Because of social and economic stress in the rapidly developing nation, peat forests are cleared today to make space for plantations producing palm oil, which is in huge demand from US and European industries. Accacia is planted for the pulp, needed by the paper, plastic and rayon industries. Valuable timber is harvested by the logging industry and in the process many important tree species are lost forever, never to be replaced.

The government also bears some responsibility; its past transmigration programs used lands cleared from peat forests. The programs were based on a sustainable self-supporting form of agriculture, requiring transmigrants to plant their own food crops, especially upland rice and lowland rice grown in sawah or flooded rice paddies.

Deforestation and burning on a huge scale are degrading the health of the environment and destroying people's living conditions. As soon as the rainy season ends, people in the peat regions and surrounding areas in Sumatra and Kalimantan are plagued by the black smoke produced by widespread forest fires burning seemingly out of control.

Air transport is disturbed because of very low visibility at major airports in the cities of Medan, Pekanbaru and Palembang, and also in neighboring Singapore. Emission of carbon dioxide (CO_2) also adds to global warming. Even after the forest fires end, the peat continues to smolder underground until all organic matter has completely burned into ashes. The loss is so great that it cannot be measured on the scale of human material wealth.

Instead, let's look at the physical, chemical and biological properties of peat, which is soil composed mainly of organic matter. Peat, with its large absorption capacity, acts as a giant sponge; it is therefore very useful during floods, as large amounts of water can be absorbed. Peat also filters out silt and fine sand from water. The above properties determine the health of the hydrology of the local ecosystem, which is thus debilitated when peat is burnt.

Regarding peat's chemical make-up, its large cation-exchange capacity (CEC) protects fresh water in the area from becoming contaminated with seawater. The CEC adsorbs sodium from the infiltrating sea water, a process similar to the desalinization of seawater.

Furthermore, peat forests are home to a wide variety of plants and animals, determining the unique biodiversity of their ecosystem. For instance, as well as the orangutan, the Proboscis monkey finds shelter

and its particular food only in the swamp forest of Kalimantan's peat regions.

Other examples are the clouded leopard, the pigtail macaque and certain types of hawk. These species and many others are now threatened with extinction, as are many plant and tree species, by massive deforestation and uncontrolled forest fires. These plants and creatures will not survive in an oil palm habitat.

The theory of soil chemistry and the principles of geology suggest that oil is formed from organic matter by a transformative process called metamorphism. The process is very slow, with the matter transforming over millions of years into a series of intermediate products such as lignite (leonardite), bitumen, asphalt, soft coal and so on. The sequence of transformation can be illustrated as follows: dead organic matter -» peat -» lignite
-» bitumen -» coal -» oil. The coal deposits in the mines of Umbilin, West Sumatra, and Tenggarong in East Kalimantan indicate that the process of metamorphism in those areas has only reached the stage of transformation into coal.

Oil fields located in the peat swamps of Riau, Jambi and Palembang in the coastal plains of east Sumatra, and those in the regions of Balikpapan and Tarakan on the east coast of Kalimantan, have contributed to increased prosperity in Indonesia, and especially to the regions containing the oil wells, as reflected by the glitter and glamor of today's Pekanbaru, Palembang, Samarinda and Balikpapan.

But the peat forests themselves are a national ecological treasure, and they are in need of serious attention and proper management.

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