**Ecosystem Type: WETLANDS**

**Category: Food, Fuel, and Materials**

1. **Materials**

***Supplier*** – Wetlands are suppliers of materials for food, fuel, and materials. For example, wetlands provide fertile soils and sources of clean water to allow agricultural practices to occur (Ramsar, 2014). Additionally, wetland plants provide a unique tangling of root systems that improve photosynthetic and transpiration rates of upland crops susceptible to flood events (Iijima et al., 2016). On the other hand, wetlands provide foraging sources to allow for animal farming (Gala and Young, 2015). In India, fish production relies upon wetland ecosystems to supply a stable environment that enables growth in reproduction (Bassi, Kumar, Sharma, and Pardha-Saradhi, 2014). Wetlands even supply plants that are used by some communities as toothbrushes and glue, like those in the Niger Delta (Adekola and Mitchell, 2011). Overall, wetlands provide a variety of materials that can be used as hubs for food, but also for basic hygiene and utility.

***Driver*** – no literature review available at this time

***Demander*** – not applicable

1. **Nutrition**

***Supplier*** – Wetlands supply nutrition to support human need for food. For example, anthropogenic wetlands like rice paddies are popular resources that supply food to more than 50% of the world’s population (Ramsar, 2014; Pester, Knorr, Friedrich, Wagner, and Loy, 2012). In developing regions, such as India, over 61% of total fish production comes from wetlands (Bassi, Kumar, Sharma, and Pardha-Saradhi, 2014). In the tropics of Africa, wetlands are depended on to provide food and water to the poor people living around them (Adekola and Mitchell, 2011). There are a range of different wetlands that provide food besides rice paddies, including coastal grazing marshes, aquaculture in large floodplains, and the cropping of small seasonal wetlands (Ramsar, 2014). Terrestrial fauna can live in these wetlands and are additional resources for human consumption.

***Driver*** – literature review not available at this time

***Demander*** - not applicable

1. **Energy**

***Supplier*** – Wetland species provide fuel energy for human use. Grains and timber grown by wetlands can be used to generate fuel (Adekola and Mitchell, 2011). A common use of wetlands for fuel is the drainage of peat soil for palm oil (Verhoeven and Setter, 2010). Palm oils are increasingly being used for energy as an alternative for fossil fuels (Verhoeven and Setter, 2010). Peat soils, themselves, are also sources of energy. One study found that over 1.94 million people in the European Union receive heat energy from peat (World Energy Council, 2013).

***Driver*** – no literature review available at this time

***Demander*** - not applicable

1. **Mediation of Waste, Toxics, and Other Nuisances**

***Supplier*** – Since wetland ecosystems supply plant and animal species that filter wastes and adsorb pollutants, they are critical for protecting water resources for food, fuel and materials. Wetland species can trap nutrients, salts, and bacteria found in water (Qasaimeh, AlSharie, and Masoud, 2015; Westbrook, Brunet, Phillips, and Davies, 2011; Functions and Values of Wetlands, n.d.). Using wetlands as a buffer to food resources can help protect agricultural goods from being destroyed from poor water quality. For example, wetlands that buffered rice paddies in eastern India helped protect the crop from polluted floodwater that occurred after a cyclone hit (World Wetlands Day, 2017).

***Driver*** – Land cover changes affect the ability of wetlands to mediate wastes that disrupt the production of food, fuel, and materials. When wetlands are altered for human use, nutrient and salt loads increase for downstream sites (Westbrook et al., 2011). If a farm is located south of a wetland, it may see the effects of any changes made to the ecosystem.

***Demander*** – not applicable

1. **Mediation of Flows**

***Supplier*** – Wetlands supply species that can mediate the flow of water to protect food, fuel, and materials. Although wetlands cannot prevent flooding, they can lower flood peaks and dissipate downward momentum of floodwaters (Gala and Young, 2015; Functions and Values of Wetlands, n.d.). This can be critical for lands that supply materials for human consumption.

***Driver*** – Transforming wetlands into agricultural and development lands decreases the ability for wetland species to control the flow of water. If a wetland buffer is converted to agriculture to increase food production, there can be consequences for crop growth especially during flood events.

***Demander*** – no literature review available at this time

1. **Maintenance of Physical, Chemical, and Biological Indicators**

***Supplier*** – Wetlands supply terrestrial and aquatic species that filter water and trap nutrients, such as nitrogen, phosphorous, and dissolved organic carbon (Ross, 2016; Qasaimeh, AlSharie, and Masoud, 2015; Westbrook, Brunet, Phillips, and Davies, 2011; Functions and Values of Wetlands, n.d.). These nutrients decrease the health and quality of the water that is used for the production of food, fuel, and materials.

***Driver*** – no literature review available at this time

***Demander*** – not applicable

1. **Spiritual, Symbolic, Religious, and Social Experiences**

***Supplier*** – no literature review available at this time

***Driver*** – no literature review available at this time

***Demander*** – not applicable

1. **Physical and Intellectual Interactions w/ Biota, Ecosystems, and Land/Seascapes**

***Supplier*** – no literature review available at this time

***Driver*** - no literature review available at this time

***Demander*** - not applicable

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