**Ecosystem Type: AGROECOSYSTEM**

**Category: Clean Air**

1. **Materials**

***Supplier*** – Agroecosystems, such as shade-grown coffee, provide materials that reduce levels of greenhouse gases because of their ability to sequester carbon dioxide (Polzot, 2004). Potential carbon sequestration by agroecosystems is 1.2-3.1 billion tons of carbon per year (Lal, 2011).

***Driver*** – not applicable

***Demander*** – not applicable

1. **Nutrition**

***Supplier*** – not applicable

***Driver*** -not applicable

***Demander*** - not applicable

1. **Energy**

***Supplier*** – not applicable

***Driver*** – not applicable

***Demander*** – not applicable

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

***Supplier*** – Wastes from livestock in agroecosystems can be used to fertilize crops, rather than flowing into a nearby waterway or emitting gaseous elements into the air (Zhiping and Dawson, 2004). Further, aquaculture agroecosystems can filter and trap domestic waste water resources (Coates et al., 2013). The species of aquaculture habitats absorb and utilize the wastes for their own productivity, rather than the wastes being available to transpire back into the atmosphere.

***Driver*** – not applicable

***Demander*** – Agroecosystems have been strategically placed in locations to address runoff and better manage wastes that could affect clean air (Sandor et al., 2007). These ecosystems are also demanded for their ability to mediate harmful dust storms by trapping sediments from eroding and being swept into the air during high wind events (Solowey et al., 2013).

1. **Mediation of Flows**

***Supplier*** – The flow of materials within agroecosystems can help maintain clean air. The integration of various plants and animals, along with smart land management can improve the use of materials and wastes created by agroecosystems. For example, wastes from livestock can be used to fertilize crops, rather than flowing into a nearby waterway or emitting gaseous elements into the air (Zhiping and Dawson, 2004).

***Driver*** – not applicable

***Demander*** – Agroecosystems have been strategically placed in locations to address runoff and better manage wastes that could affect clean air (Sandor et al., 2007). These ecosystems are also demanded for their ability to mediate harmful dust storms by trapping sediments from eroding and being swept into the air during high wind events (Solowey et al., 2013).

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

***Supplier*** – Potential carbon sequestration by agroecosystems is 1.2-3.1 billion tons of carbon per year (Lal, 2011). If managed properly, agroecosystems were also found to mitigate nitrous oxide—a greenhouse gas that is typically generated from agricultural practices (Mutuo et al. 2005). They also support clean air because they can control the biophysical process of cycling water (Coates et al., 2013). Agroecosystem plants can uptake water from the soil through its roots, which transpires back into the atmosphere, making oxygen available for the surrounding habitats.

***Driver*** – not applicable

***Demander*** – Agroecosystems have been strategically placed in locations to address runoff and better manage wastes that could affect clean air (Sandor et al., 2007). These ecosystems are also demanded for their ability to mediate harmful dust storms by trapping sediments from eroding and being swept into the air during high wind events (Solowey et al., 2013).

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

***Supplier*** – not applicable

***Driver*** – not applicable

***Demander*** – not applicable

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

***Supplier*** – not applicable

***Driver*** – not applicable

***Demander*** - not applicable

**Sources:**

Lal, R. (2011) Sequestering carbon in soils of agro-ecosystems. *Food Policy, 36*(Supplement 1), S33-S39. <https://doi.org/10.1016/j.foodpol.2010.12.001>.

Mutuo, P.K. et al. (2005) Potential of agroforestry for carbon sequestration and mitigation of greenhouse gas emissions from soils in the tropics. *Nutrient Cycling in Agroecosystems, 71*(1), 43-54. <https://doi.org/10.1007/s10705-004-5285-6>. [abstract only]

Polzot, C. L. (2004) *Carbon Storage in Coffee Agroecosystems of Southern Costa Rica: Potential Applications for the Clean Development Mechanism.* Unpublished master’s thesis, York University, Toronto, Ontario, Canada.

Sandor, J.A. et al. (2007) Biogeochemical studies of a Native American runoff agroecosystem. *Geoarchaeology, 22*(3), 359-386. DOI: 10.1002/gea.20157.

Zhiping, C. and Dawson, R. (2004) Modeling circulation function in agroecosystems. *Ecological Modelling, 181*(4)*,* 557-565. <https://doi.org/10.1016/j.ecolmodel.2004.06.041>.