

Technical Appendix 11.3: Ecosystem Services Review

Intended for

Bugesera Airport Company Limited

Date

October 2017

Project Number

UK11-24483

NEW BUGESERA INTERNATIONAL AIRPORT

APPENDIX 11.3: ECOSYSTEM SERVICES REVIEW

1. APPENDIX 11.3: ECOSYSTEM SERVICES REVIEW (ESR)

Ecosystem services are the goods and services provided by ecosystems upon which human wealth and individual well-being depend. The environment provides mankind with the food, water and air that are essential for life and with the minerals and raw materials for industry and consumption. Less obviously, it provides the processes that purify air and water, and which sequester or break down wastes. It is also in the environment where recreation, health and solace are found and in which human culture finds its roots and sense of place. Scientists refer to these services that the environment provides as 'ecosystem services', recognising that it is the interaction between the living and physical environments that deliver these necessities^{1,2}. For the ESR, ES are depicted within four service subset categories: Provisioning; Regulating; Cultural; and Supporting. Supporting services (e.g. soil formation, primary production and genetic exchange) are those that underpin the other three categories of services. Therefore, supporting services are not assessed separately within this section.

The overall aim of the ecosystem service concept is to bring a holistic approach to environmental decision-making by valuing the environment in terms of the benefits people obtain from ecosystems. It is practical and pragmatic, focussing on goals that provide greatest environmental benefit at least cost to society and the natural environment with the aim of avoiding taking decisions with unintended secondary consequences that may be costly, increase risk or be detrimental to ecosystems and human wellbeing. The evaluation of the effects, both desirable and undesirable, of approaches to landscape management on the delivery of ecosystem services allow for a broader assessment of the true costs and benefits of actions and policies.

The IFC Performance Standards divide ecosystem services into two priority types:

- Priority 1: Those services on which project operations are most likely to have an impact and, therefore, which result in adverse impacts to Affected Communities; and
- Priority 2: Those services on which the project is directly dependent for its operations (e.g. water).

In addition, where Affected Communities are likely to be impacted, they should participate in the determination of priority ecosystem services in accordance with the stakeholder engagement process as defined in IFC Performance Standard 1. Table 1 screens the ecosystem services that are relevant to the Project Area of Influence and categorises them according to either priority 1 or priority 2.

¹ UK National Ecosystem Assessment (UKNEA), 2011. The UK National Ecosystem Assessment: Synthesis of the Key Findings. UNEP-WCMC, Cambridge.

² IFC Performance Standards, January 2012.

Table 1-1: Ecosystem Services Review

Ecosystem Service	Priority Type	Relevance to Study Area
Provisioning		
Crops	Priority 1	Subsistence crop cultivation is the main type of agriculture in all villages with people being dependent on it for food, supplemented by buying food from markets. In the case of 17 villages (almost 50% of the total number in the survey), food production from subsistence agriculture is insufficient to meet the needs for farming households. The main crops farmed in all villages are beans, maize, cassava and banana with other crops, farmed in certain villages, being include sweet potatoes, soya beans and sorghum. See Chapter 18: Socio-Economics
Livestock	Non-priority ecosystem service	Livestock farming not widespread in area.
Capture fisheries / Aquaculture	Priority 1	Six villages are involved in capture fisheries and/or aquaculture using Lake Kidogo; one village (Kurugenge) undertakes capture fishing on the Akagera River and one village (Mwesa) uses the Mwesa wetland (eight villages in total). The numbers of village residents employed/engaged, primarily, in fishing varies from approximately 60 men in Uwimpunga Village to 10 men or fewer in the other seven villages. See Chapter: 18 Socio-Economics Chapter
Wild foods	Non-priority ecosystem service	No specific information is available on the use of wild foods. However, given the largely cultivated nature of the Project Area, wild foods (except fish) are unlikely to be a Priority ecosystem service.
Timber and other wood fibre	Priority 1	Priority 1 – For main sources of energy for cooking at the national level, 95% of households depend either on firewood (82%) or charcoal (13%). Firewood is more likely to be used in rural areas (93%) than in urban areas (31%), while charcoal is more likely to be used in urban areas (63%) than in rural areas (3%). The 2010 ESIA survey states that the majority (98.1 %) of the households reported that they use firewood as their main source of fuel. See Chapter 18: Socio-Economics
Hunting	Priority 1	It is likely that unofficial hunting of bush meat for food takes place in the Proposed Project Area.
Freshwater	Priority 1 and 2	Priority 1 – Only six villages have households with indoor access to potable water. For approximately half the villages (21), potable water is located between 0.5 and 2 km from the village. For the rest, it is located within 0.5 km. Five villages do not have access to potable water within 2 km: Amizero, Byimana, Kivumu, Mwesa, and Rurimpyisi. However, non-potable water is accessible between 0.5 km and 2 km. Most water sources are in valleys or low-lying areas. See Chapter 18 Socio-economic Chapter

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Ecosystem Service	Priority Type	Relevance to Study Area
		Priority 2 – Water will be extracted from Lake Kidogo for use during construction. See Chapter 12: Water Resources
Genetic resources	Non-priority ecosystem service	No significant genetic resources reported in the Project Area
Biochemicals, natural medicines, and pharmaceuticals	Priority 1	No specific information is available on the use of wild foods. However, collection of medicinal plants is likely to take place. Bugesera has 15 health centres (one per sector) and a hospital at Nyamata. Despite the number of health centres the mean walking distance to a health centre in Bugesera District is 74.5 minutes. See Chapter 18: Socio-Economics
Regulating		
Air quality regulation	Priority 1 and 2	Priority 1 – clean air used by local communities Priority 2 – construction and operation phases will use the air to dispose of emissions See Chapter 9: Air Quality
Global climate regulation	Priority 1 and 2	Priority 1 - The Project Area currently stores carbon in soils and trees Priority 2 - Construction and operation phases will use the air to dispose of carbon emissions See Chapter 9: Air Quality and Chapter 17: Resource efficiency
Regional/local climate regulation	Priority 1	The Project Area currently regulates micro-climates through its topography and vegetation
Water regulation	Priority 1	The Project Area currently regulates hydrology and water tables See Chapter 12: Water Resources
Erosion regulation	Priority 1	Priority 1 – Vegetation cover within the Project Area reduces erosion due to disturbance. See Chapter 13: Geology and Soils
Water purification and waste treatment	Priority 1	In the Bugesera District, 58.4% of households dispose sewage in the bush, while 21.8% of sewage is disposed using other/unspecified modes. Most households in the villages do not have direct access to wastewater treatment. See Chapter 18: Socio-Economics

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Ecosystem Service	Priority Type	Relevance to Study Area
Disease regulation	Priority 1	Naturally functioning ecosystems generally self-regulating against disease/pathogens. However, Malaria is the main illness affecting all villages and spread by a natural water-borne parasite (mosquitos). See Chapter 18: Socio-Economics
Pest regulation	Priority 1	Naturally functioning ecosystems generally self-regulating against pests
Pollination	Priority 1	The Project Area currently supports pollinators and pollination is important for local crop production
Natural hazard regulation	Priority 1 and 2	Vegetation cover, unimpacted soils and natural drainage important in flood alleviation See Chapter 12: Water Resources and Chapter 13: Geology and Soils
Cultural		
Sacred or spiritual sites	Non-priority ecosystem service	Not relevant – no sacred sites present, no cultural heritage sites found within the Project AoI
Areas used for religious purposes	Non-priority ecosystem service	Not relevant – religious centres focussed on buildings, not natural environment
Recreational value	Non-priority ecosystem service	Not relevant –no major recreational activity taking place
Ecotourism areas	Non-priority ecosystem service	Not relevant – no major ecotourism activity taking place