China, People's Republic of: Innovative Carbon Capture through enhanced Fecal Sludge Management

Project Name	Innovative Carbon Capture through enhanced Fecal Sludge Management
Project Number	52290-001
Country	China, People's Republic of
Project Status	Proposed
Project Type / Modality of Assistance	Technical Assistance
Source of Funding / Amount	
Strategic Agendas	Environmentally sustainable growth Inclusive economic growth
Drivers of Change	Governance and capacity development Knowledge solutions Partnerships Private sector development
Sector / Subsector	**Water and other urban infrastructure and services** - Urban sanitation
Gender Equity and Mainstreaming	Effective gender mainstreaming
Description	The technical assistance (TA) will support the development of carbon sequestration and safe carbon sink plans resulting from enhanced tree irrigation through improved fecal sludge management (FSM) practices. A market assessment funded by the Sanitation Financing Partnership Trust Fund (SPF) under the Water Financing Partnership Facility (WFPF) has recommended enhanced fecal sludge management practices that can result in reusing treated sludge for the safe irrigation of trees in the Beijing Capital Region (BCR) and other water-stressed cities in the People's Republic of China (PRC). As a result of improved irrigation practices, improved tree growth will function as carbon sink, improving carbon capture.

Project Rationale and Linkage to Country/Regional Strategy	Both water shortages and increased energy consumption are serious climate mitigation issues in PRC. The Government is responding by investing in carbon dioxide (CO2) mitigation measures and although carbon capture technologies hold promise, trees remain the best carbon sink. Trees need water and water starved areas in Northern China, including BCR, face energy-intensive and expensive alternatives to meet increasing water demand. About two thirds of PRC cities (400 cities) are facing different degrees of water stress. Beijing (21.7 million) and Hohhot (2.5 million) are among the top 10 most affected cities. In addition, 9 of the 14 main coastal cities including Qingdao (9.6 million) have serious water shortages. Over the last 20 years, PRC actively pursued centralized wastewater management for densely populated cities. Sewerage coverage went from less than 15% in 2000 to over 90% in 2015. However, peri-urban areas still rely on onsite sanitation and septic tanks are mandatory for all buildings to reduce solids content to the sewerage system. Huanwei Sanitation Company, a state-owned enterprise (SOE) of the Beijing Municipal Government (BMG), operates fecal sludge collection and treatment facilities in many China's cities, including Beijing, Hohhot and Qingdao. Fecal sludge is highly mineralized compared to treated wastewater sludge due to longer retention time in septic tanks and is ideal for watering and nurturing trees. Cities are struggling to dispose treated sludge, a by-product of the wastewater treatment process, in a sustainable and cost-effective manner. Several cities are exploring incineration and other energy-intensive, high carbon footprint methods to reduce land disposal cost most landfills reaching full capacity. Sludge reuse for trees' irrigation in Beijing would result in CO2 emission reduction over 40,000 mtCO2 per year through: (i) 70% reduction of nearly 2,000 mtCO2 per year equivalent from the traditional collection, treatment and disposal of sludge; (ii) 70% reduction of approximately 2,000 mtCO2 per year equivalent from trees' irrigation using existing water resources; (iii) around 3,600 mtCO2 equivalent from offseting the use of fertilizers; and, (iv) about 33,000 mtCO2 per year equivalent sequestered through faster trees growth and increased trees' survivability of 30%. Over 27% of PRC is under threat from desertification, affecting about 400 million people. Causes include large populations living in dry lands, climate change and limited water resources. To combat desertification, the government initiated in 1978 the Three-North Shelterbelt Project, also known as the Great Green Wall. The plan is for 100 billion trees to cover over 4,500 square kilometers of area along the northern part of PRC. In 2015, PRC announced at the COP21 in Paris, climate resilient policy at the highest level of the State through the Intended Nationally Determined Contribution (INDC) to increase the volume of forest stock by approximately 4.5 billion cubic meters over 2005 levels by 2030. With about half of the trees already planted and several successful tree barriers, the effort is now to plant trees in peri-urban locations: Beijing plans to plant 300 million trees; Hohhot 1 billion trees and Qingdao is preparing a strategic plan, resulting in additional carbon emissions reduction and more opportunities for using sludge in irrigation. The market assessment confirms that using treated sludge for watering trees in PRC's water stressed cities is a bankable proposition with interest from the private sector. The results present innovative carbon sink methods using advanced technologies to demonstrate the use of sludge as a resource instead of a waste. However, the proof of the concept requires additional studies to guarantee the public health safety for the use of sludge and to optimize the business proposition. The market assessment concluded with a final stakeholders' workshop in April 2018 with representatives from the State Forest Administration, Beijing Drainage Group, Beijing Forest Bureau, Beijing Water Research Institute and Huanwei Sanitation Company. The assessment concluded that a pre-feasibility program is required to (i) showcase cost-efficient, private sector-driven solutions that reduce sludge energy footprint, sequester carbon, reduce land erosion, improve air quality, help moderate extreme heat, and combat desertification; (ii) define the institutional framework among the stakeholders; and (iii) finalize a business plan to enable PPP.
Impact	Green Investment and growth increased. Volume of forest stock increased approximately 4.5 billion cubic meters over 2005 levels by 2030.
Outcome	Fecal sludge management practices in the PRC enhanced
Outputs	Business model demonstrated Safeguard procedures defined
Geographical Location	Beijing

Summary of Environmental and Social Aspects
Environmental Aspects
Involuntary Resettlement
Indigenous Peoples
Stakeholder Communication, Participation, and Consultation
During Project Design
During Project Implementation

Responsible ADB Officer	Jenny, Hubert M.
Responsible ADB Department	East Asia Department

Responsible ADB Division	Public Mgt, Financial Sector and Regional Coop Division, EARD
Executing Agencies	*Asian Development Bank* *6 ADB Avenue,* *Mandaluyong City 1550, Philippines*

Timetable	
Concept Clearance	03 Dec 2018
Fact Finding	26 Nov 2018 to 26 Nov 2018
MRM	-
Approval	-
Last Review Mission	-
Last PDS Update	03 Dec 2018

Project Page	https://www.adb.org/projects/52290-001/main
Request for Information	http://www.adb.org/forms/request-information-form?subject=52290-001
Date Generated	05 December 2018