Inception Workshop to initiate a research work on "**The Economics of Solid Waste Management and Drainage: Sustainable Approach to Making South Asian Cities Climate-Resilient**"

March 2 – March 3, 2017

Bharatpur, Nepal

Most fast-growing cities in South Asia face increased waterlogging and water contamination from improperly managed solid waste. Extreme weather events, including floods and droughts, are expected to further aggravate the operation of water supply, drainage, and sewerage infrastructure. Protecting cities requires reducing waste and improving waste collection, investment in drainage, replacing riverside and wetland dumping with engineered landfills, and identifying sustainable mechanisms to finance waste management.

Amongst the many threats from climate change in South Asia, responding to flooding and extreme rain events is a priority for cities. The effects of climate-driven heavy rainfall and storm surges are exacerbated in urban centers because of inadequate drainage systems. Exposed cities are at risk from immediate costs from losses in life, assets and productivity and by the disease outbreaks from waterlogged drains and contaminated drinking water. To enable waste to be managed under circumstances of extreme or frequent flooding and heavy rainfall, cities will need to become more resilient. This research would help to increase the resilience of municipalities in three ways: a) identifying ways to reduce the quantity of waste per capita, b) enabling cities to improve their revenue collection so as to finance improved solid waste and drainage management systems; and c) enabling municipal staff to adapt to climate change by making better system-level decisions based on tools such as GIS and hydrological modeling.

The research will identify ways to reduce and re-use waste and increase revenue collection. Furthermore, it reduces the carbon footprint of the cities and so contributes towards a mitigation solution (Bangladesh Climate Change Strategy and Action Plan (BCCSAP), for example, by promoting city waste management it is planning to 'ensure liveable cities while lowering GHG (methane) emissions") as envisaged in the INDCs of Bangladesh and Nepal.

This study undertakes hydrological modeling and economic analysis of solid waste and drainage management systems in two cities in South Asia: Bharatpur in Nepal and Sylhet in Bangladesh to: i) identify the extent to which waste segregation and improved solid waste management can obviate the need for additional physical investments, ii) understand what incentives and systems can be used to induce households and other establishments to consistently segregate waste, so as to reduce the collection burden on municipalities and enable more comprehensive and cost effective composting and recycling arrangements, iii) identify how improvements to solid waste management systems can be financed in a sustained manner, and iv) assess the staffing and financial requirements for cities to sustainably implement such changes. In order to learn from private sector initiative, we extend this study to Kawasoti in Nepal as an additional city for understanding what incentives and systems can be used to induce households for segregating household wastes for reducing, reusing and recycling arrangements, for newer cities in Nepal.

The project will inform management and policy decisions in the cities because of improved evidence on and capacity to examine the:

- solid waste drivers of water-logged drains and how these are likely to change with climate changes;
- efficacy of different waste reduction approaches; and
- viability and distributional implications of different financing strategies.

The GIS and drainage modeling exercise and strategies to use economic incentives will help familiarize city governments with the use of these methods and their utility for making the cities climate smart. Beyond the two plus one cities, the research will reach out to a broader group of stakeholders to influence how cities think about and plan for waste management in the context of climate change. Research outputs include peer-reviewed publications, technical reports, and policy briefs. Other communications products that are planned include newspaper clips, blogs, audio visual clips for social media (YouTube/Facebook), and workshops for stakeholders, to disseminate research findings.

On this backdrop, the South Asian Network for Development and Environmental Economics (SANDEE), in collaboration with the Asian Center for Development (ACD), Bangladesh, and Integrated Water Modeling (IWM), Bangladesh is organizing a two-day inception/consultation workshop in Bharatpur, Chitwan. The three-year research on ""**The Economics of Solid Waste Management and Drainage: Sustainable Approach to Making South Asian Cities Climate-Resilient,**" falls under the wider theme of "Climate Change and Cities (CCC)." The main objectives of this workshop are to:

- Exchange ideas on the joint research between SADNEE, ACD and IWM
- Develop a mechanism to coordinate the field level work among the municipalities, private contractors who manage solid wastes, and the research team
- Develop a protocol and methods for surveying Bharatpur to generate data for modeling drainage network

Tentative Program

Date/time	Activities	Speakers
Day 0: March 1		
16:45 pm	Bangladesh Team Arrives KTM	
Day 1: March 2		
10:30 AM	Travel to Bharatpur (arrive Kathmandu airport before 1 hour)	
12:00 - 13:00	Lunch	
13:00 - 18:00	**Consultation Meeting**	
13:00 - 13:15	Introduction	Team
13:15 - 13:45	Background of the research project and proposed activities (Nepal)	E. Somanathan, Mani Nepal, SANDEE
13:45 - 14:15	Background of the research project and proposed activities (Bangladesh)	AK Enamul Haque, ACD

14:15 - 14:40	status of city drainage and solid waste managemnt in Sylhet City	Chief Engineer, Sylhet City Corporation
14:40-14:55	Status of city drainage and solid waste management in Bharatpur	Chief Executive Officer, Bharatpur
14:55 - 15:10:	Status of City drainage and solid waste management in Kawasoti	Chief Executive Officer, Kawasoti
15:10 – 15:20	Support to cities from Solid Waste Management Technical Support Center	SWMTSC
15:20 – 15:30	Existing policies on SWM in Nepal	MoFA& LD
15:35 - 16:00	Tea/coffee break	
16:00 - 17:00	Drainage Network Modeling: Data needs & Proposed survey activities	IWM
17:00 - 18:00	General Discussions	All
18:30 onwards	Dinner	
Day 3: March 3		
9:00 - 1:00	Site visits for understanding drainage and SWM issues	
1:00 - 2:00	Lunch	
2:30 - 4:00	Discussion on drainage network survey	IWM
4:00 - 4:30	Tea-break	
4:30 - 6:00	Planning meeting	Research Team (SANDEE, ACD, IWM) & invited members
Day 4: March 4	Return to KTM/Dhaka	

Note: The survey expert, NDI Engineer and Municipality rep will do two-day field visit while others will be in the workshop.