Japan SDGs Innovation Challenge for UNDP Accelerator Labs
[Malawi] ACCELERATOR LAB INNOVATION CHALLENGE

Target SDGs	12
Sustainable development challenge that A-Lab is working on.	Located in Southern Africa, Malawi is landlocked, sharing its borders with Mozambique, Zambia and Tanzania. The country has a population of over 18 million, with 70% living below the poverty line. The country has a high level of unemployment among the productive population which is largely composed of young people (40%). Malawi remains one of the poorest countries in the world despite making significant economic and structural reforms to sustain economic growth. Development challenges are multi-pronged, including vulnerability to external shocks like weather and health, rapid population growth, environmental degradation and energy shortage. Infrastructure development, the manufacturing base, and adoption of new technology are still low with a huge growth potential. In the world, Malawi has one of the fastest urbanization rates at 4.19% per annum. Like all fast urbanizing cities, Malawi's cities – namely Blantyre, Lilongwe, Zomba and Mzuzu – are challenged by accumulation of waste due to high urbanization and limited resources and coordination of their public services. On average, these cities produce a high amount of solid waste estimated at around 300,000 metric tons, of which a very small percentage is collected (12%), processed or treated. Support from UNDP and other donor agencies introduced waste transfer stations in some communities to empower communities to reduce and manage waste that goes to dumpsites and create employment for youth and women through recycling and compost manure making. Challenges of foul smell, poor quality of compost and poor waste collection and management of the transfer stations has left the project unattractive to communities. Waste management privatization has been partially done in most of the city councils although private waste collectors (largely informal) are only filling part of the gap due to technical and operational challenges. Coordination among waste generators (households, institutions), waste collectors and recyclers who create and sell products remains very weak. Technology, innovations and behavior change interventions to create critical mass for shifting civic perceptions and action in reduction and management of waste are inadequate. Lastly, we lack structured markets for organic waste products like composted manure. Opportunities exist however for innovative recycling of waste and biogas production.
Learning questions that A-Lab is trying to answer related to this challenge.	We have narrowed **4 areas** of intervention in addressing our challenge and these include reducing waste generation, improving waste collection at municipal level, improving waste disposal at designated disposal sites and illegal dump

	sites, and turning waste into resources. For each of these areas we have the following learning questions: **1. Reducing waste generation** Can waste generated by households and institutions be turned into energy (biogas) for use at source using low cost technologies? Can we create community composting projects to make use of food waste and sludge readily available in the communities? Can structuring a market for compost manure lead to better management of organic waste and create employment opportunities for community members? **2. Improving waste collection** Can mobile-based apps facilitate coordination between households, institutions, waste collectors, recyclers and city councils? Can behavior change initiatives encourage households and institutions to stop burning waste and start separating waste at source? **3. Improving waste disposal/management** Can a market system approach for private waste collectors and recyclers improve waste management? Can using better models for waste transfer stations encourage community use of these stations and ensure these stations do not pose environmental problems? Can we support Public Private Partnership models for private sector players to partner with municipal/city councils to improve waste collection and disposal? **4. Turning waste into resources** Can financing for innovations help turn waste into products thereby creating jobs for youths? How can we organize the sector to facilitate access to finance? How can we attract local investment into the waste management space? Does the ban on thin plastics provide opportunities to turn plastic waste into alternative products like shopping bags? Are there better technologies/ techniques for composting that can be cheaper, less labor intensive and make composting appealing? Are there low-cost technologies/techniques for recycling paper waste into sustainable cooking materials like briquettes?
Target beneficiaries and stakeholders that A-Lab is serving related to these learning questions and the development challenge.	Given these **4 intervention areas**, we are serving an array of stakeholders in the following ways. **1. Reducing Waste Generation** **General Public** In the spirit of Mottainai (which encompasses the practice of treasuring and using all things as long as possible which includes recycling) Work with households to reduce waste generation and segregate waste at source. In addition, empower

	households to demand well organized services from waste collectors for better service and protect the environment. **Private Companies** Use techniques that result in less waste generation and manage the waste through segregation to be used as raw materials for recyclers. **2. Improving Waste Collection** **General Public** Improve behavioral change strategies and awareness campaigns on proper waste management and segregation at source. **Private Companies (Waste Collectors and Recyclers)** Enhance capacity of collectors to operate and support the city council in collecting more waste through provision of funding for capital expenditure (CAPEX) and other business development services. In addition, provide access to information on waste hotspots for collection and linkages with recyclers for proper disposal. Support recyclers to be able to source raw materials (feedstock) for their operations to be able to produce at scale. **Manufacturing companies** Train companies on better waste management techniques and link them with waste collectors and recyclers. Better waste management techniques through provision of innovative/ efficient devices with necessary training. **City Councils** Increase their capacity through better equipment and Public Private Partnerships (PPP) models with private sector players. In addition, the private sector players will provide the relevant capacity to reach households the city councils are failing to reach. **3. Improving waste disposal/management** **Households** Organize community members, especially women, and youth into cooperatives that can be trained to do composting and earn a living as they improve management of organic waste. **Private Companies** Provide recyclers with a steady source of raw materials. **4. Turning waste into resources** **Private Companies (Waste Collectors and Recyclers)** Build capacity of collectors to operate and support the city council in collecting more waste through provision of funding for CAPEX and other business development services. In addition, provide access to information on waste hotspots for collection and linkages with recyclers for proper disposal. Enhance partnership and technology transfer between Malawian and Japanese private sector.

Description of the problem to Japanese partners who may wish to work with A-Lab.	**In the 4 highlighted areas of interventions, we need to work with a diverse group of experts who can transfer skills, knowledge, technology and technical knowhow.** **1. Reducing waste generation** **Manufacturing Companies** Share methodologies, techniques and knowledge on how manufacturing companies in Japan have reduced waste generation in their operations. The Japanese companies can share recycling devices. **Academics** We are eager to learn from academia on the research that has been conducted when Japan was experiencing the challenges that Malawi is experiencing now in managing waste, and what behavior change interventions can work for different tiers of society in a short period of time. The critical areas for behavior change in Malawi are seeing waste as value/resource, separating waste, stopping open burning and stopping illegal dumping. Knowledge based support in developing innovative approaches or new models of work for changing perceptions to increase use of waste to produce biogas that can ably serve households cooking activities. Currently for example there is negative perception in turning sludge into gas for cooking. **2. Improving waste collection:** **Private Firms** Expertise on how to use novel technologies and data like AI and data science in improving waste collection in the cities. Application of digital technology to effectively run the waste management system, any technology, systems and devices to provide a marketplace. Advisory on financing the waste management industry in Malawi. Most of the players will need to raise funding locally from banks and other investors hence the need for advisory services. Japanese private sector to advise on the development of waste management services in Malawi. Establish knowledge transfer opportunities/programmes between our private sector players to and Japanese SMEs working in waste, that can create partnership for business opportunities in Malawi and neighboring countries. **Civil society** Collaborate with Malawi's civil society through training and approaches on how to lobby for improved legislation and policy to create an enabling operating environment for all players particularly private waste collectors. Support in creating a framework for mobilizing and organizing various players in the sector to have a holistic market system approach so that the market/value chain is structured. The main aim is to get advice on how to have stakeholders discuss about waste. Also, to learn how the civil society in Japan is able to re-enforce civic initiatives in managing and reducing waste. **Think Tanks** We are eager to learn the model of managing waste transfer stations that Japan is successfully using. If this knowledge is transferred, we could ably support our city councils to replicate this model

	Learn how PPP models in Japan are structured and run in the waste management and the circular economy sector. **3. Turning waste into resources** **Private firms** One of the municipal/city councils has plans of collecting waste in bulk, processing it and exporting it. The city council and private players can benefit from knowledge or expertise in structuring PPP models to successfully run the operation. In addition, expertise in canvassing the export market will add value. Transfer of low-cost technology (plant/machinery) that can be used for testing small scale recycling as a market test for Japanese companies or for testing potential of recycling business in Malawi. **Manufacturing Companies** Low cost technologies and techniques for turning household waste into biogas. **Civil Society** Case-studies from Japanese civil society / NGOs that have run relevant campaigns in turning waste into resources. For example, we have learnt that some NGOs in Japan were instrumental in diverting dumping of oil residues into lake by innovatively turning the oil into soap. **Academics** Japanese academia to share research findings on various technologies, techniques and data on turning waste into resources. For the Malawi Lab, partnerships with local universities has been a source of interesting solutions in the various frontier challenges we are working on.
Research done on current market solutions that informs this work as needing innovation.	It is estimated that between 280,000 and 320,000 Metric tons of solid waste remains uncollected each year in the four cities of the country alone. Much of this uncollected waste is disposed of indiscriminately in open spaces, waterways and along roadsides. The most common methods of disposal at household level are burning, dumping in open space and burying. Against this background, we consulted with city councils, waste collectors, recyclers and households first to understand the drivers of the problem of the unmanaged waste and brainstorm on possible solutions. The main drivers of the problem are lack of awareness on waste management (29%), limited innovations in waste management (24%), outdated policies (21%), lack of collaboration (14%) and lack of financing (13%). The outputs of these workshops were used to hold a design workshop to co-create solutions. The solutions that were designed included turning waste into biogas and composting, collaboration mobile app, behavior change, financing for waste innovations and a marketplace for waste. We further conducted a primary research using an online polling platform (SurveyMonkey) to understand how participants manage waste and results indicate that most of the waste is not separated (67%) and is not made available to recyclers (44%) due to use of rubbish pits and burning. Households disposing of waste outside their homes are relying more on private waste collectors than city and district councils. This translates to a huge opportunity in promoting recycling initiatives which require collaboration between households, private waste collectors and city and district councils to be effective.

The way Japanese science/technology /methodologies could advance A-Lab's work on this problem.	We believe Japanese science/technology/methodologies can help advance our work in the following key four ways: **1. Tech and Skills Transfer** Lab partners will benefit from support on technology and skills as well as devices for experimentation and demonstration. Some of the innovations like waste to energy, plastic waste products and compost manure (which is key in organic agriculture) will be improved with better technology and testing to improve the final products. Malawi's city councils will also learn behavior change insights from Japanese cities, which rank highly among the top cleanest cities in the world with no public littering despite having a large population. **2. Testing and Scaling** Innovations around converting plastic waste into usable products like rooftiles, bricks and pavers are in a nascent stage hence they need support to move from ideas into proofs of concept in preparation for commercialization. The solutions will need scale-up strategies to be able to reach mass market and achieve the necessary change in the society. **3. Business Development Services** Advisory and training in business modelling and structuring will help private waste collectors, innovators, start-ups and recyclers in coming up with sustainable business models in the sector. They need skills in go to market strategies, developing and delivering growth plans, unique value propositions, supply chain management, cost models and many more. **4. Technology support** Most of the specialized garbage trucks circulating in Malawi are used car imports from Japan. At times city councils and private operators find it challenging to maintain these vehicles due to lack of updated technology in-country. Working with Japanese private sectors will help us access appropriate technology and technical know-how on upgrading and maintaining them.
Experimental and/or exploratory component.	A-Lab Malawi will work with Japanese private sector and academia to test proposed technologies and techniques for turning household waste into biogas and compost on a small scale before mass deployment. The Lab will also explore different business models for the private waste collectors, innovators, start-ups and recyclers to test what works for sustainable operations. The lab is keen to learn how a market can be structured for some of the recycled products. Use of mobile app and data to assist both city council, households and private players in collaborating to better manage waste. Application of behavior change initiatives will help us understand which initiatives have the potential to promote separation of waste as well as appropriate disposal. We are exploring PPP models that can support both the city councils and the private sectors in waste collection and disposal. If successful, the lab can use its

	network (90 labs) and can export the model to other countries especially within the Sub Saharan Region.
Description of A-Lab portfolio.	We have ''waste management/circular economy'', ''youth'', ''Energy'' and ''COVID-19'' as our frontier challenges. Now we are sourcing solutions for Energy including clean cooking fuels/technologies both for urban and rural populations. We have already identified academia and private sector players (with biogas digester prototypes). We have also identified lack of waste management for face masks as an emerging challenge. Face masks became mandatory and the public is wearing disposable medical masks more than cloth masks. Finding technologies that translates waste into Energy or working on changing people's perceptions to view waste as a valuable source for Energy will add value to our work on Energy. Finding solutions for city councils to manage municipal waste will simultaneously help us address waste challenges brough in by COVID-19. Under challenge for Youth, we are looking unto unlocking solutions for unemployment, therefore working on innovative financing initiatives with Japanese private sector might provide employment opportunities for the youth. Working on waste therefore gives us opportunities to find solutions in different aspects of the other three challenges we are also working on. UNDP Malawi has a large portfolio on resilience and climate change, this work will feed into other initiatives under this portfolio so that efforts can be augmented. The work also has linkages with other projects within the country office like the **Growth Accelerator Program** which provides funding to de-risk post revenue SMEs which can ably scale-up the budding operations under the Lab's waste challenge. Another relevant project is **Malawi Innovation Challenge Fund (MICF)** that is involved in providing matching grants for larger scale SMEs that have innovative products targeting specific issues. UNDP will advocate this work by working with government line ministries through policy change advocacy.
Information publicly available on A-Lab's work on this. And previous or ongoing experience country office have working with Japanese partners.	**Links for Waste management initiatives in-country background information:** 1. https://www.faceofmalawi.com/2020/08/18/chilima-shocked-with-poor-waste-management-in-mzuzu-city/ (current situation) 2. https://www.nyasatimes.com/mzuzu-city-council-to-export-waste-to-south-africa/ (potential solution) 3.https://www.manaonline.gov.mw/index.php/national/environment/item/9040-mzuzu-city-council-to-privatize-waste-management-services 4. https://blogs.worldbank.org/nasikiliza/investing-in-waste-management-to-create-job-opportunities-for-malawis-youth 5. https://www.nyasatimes.com/ccjp-hailed-for-promoting-urban-governance-at-lilongwe-city-council/ (Waste Transfer Station in Lilongwe or composting)

	Country Office Experience with Japanese Partners UNDP Malawi has Partnered with the Government of Japan around resilience; through the Africa Adaptation Programme which was implemented from 2010 to 2013 with a budget of US$ 3,881,575. The project delivered mechanisms for improving climate-related planning at national and district level; strengthened technical, legislative and non-state institutions to support effective, co-ordinate adaptation; implemented and tested adaptation measures and a climate investment plan which includes a range of financing options, and lessons for sharing nationally and internationally. More recently, UNDP Malawi has partnered with Government Japan to support the most affected vulnerable groups who were affected by cyclone Idai. With funding from Japan amounting to 2,321,090, the project will construct 200 climate resilient houses for the worst hit communities with least capacity to recover, will rehabilitate livelihood restoration infrastructure and will train government officials, contractors and artisans in resilient reconstruction. Japan is the global lead in reconstruction, and this partnership will further leverage on Japan's experience in managing crises and recovery and will support Malawi towards resilient reconstruction.