TC Document

I. BASIC INFORMATION FOR TC

Country/Region:	REGIONAL
TC Name:	A digital social innovation approach to reducing food loss and waste
TC Number:	
Team Leader/Members:	Carlos Guaipatin (IFD/CTI), team leader; Marieke Goettsch (IFD/CTI); Santiago Nicolás Cañete (IFD/CTI), Miguel Lage (IFD/CTI), Adriana Oreamuno (IFD/CTI), Ana Rios Galvez (CSD/RND)
Taxonomy:	Research and Dissemination
Date of TC Abstract authorization:	XXXXXXXXXXX
Beneficiary (countries or entities which are the recipient of the technical assistance):	TBC
Executing Agency:	Inter-American Development Bank (IDB), through the Competitiveness and Innovation Division (IFD/CTI)
Donors providing funding:	XXXX
IDB Funding Requested:	US$385,000
Local counterpart funding, if any:	No
Disbursement period (which includes Execution period):	30 months
Required start date:	XXXXXXXXXX
Types of consultants:	Firms and individual consultants
Prepared by Unit:	IFD/CTI
Unit of Disbursement Responsibility:	IFD/CTI
TC Included in Country Strategy (y/n):	n/a
TC included in CPD (y/n):	n/a
UIS Sector Priority:	Yes

II. OBJECTIVES AND JUSTIFICATION OF THE TC

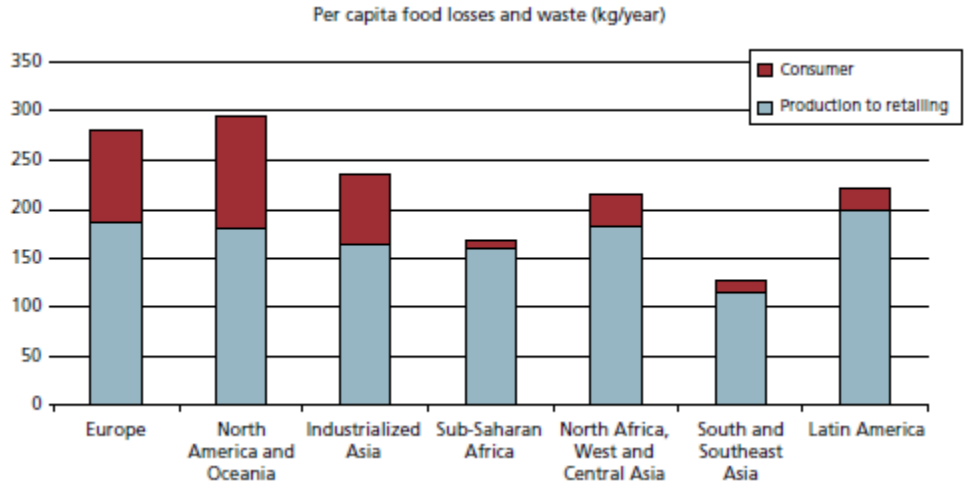
1. Food is lost or wasted throughout the whole food supply chain (FSC), from initial agricultural production down to final household consumption.[1] Usually, experts make a distinction between food loss, which refers to all that edible food mass that does not make it to the distribution and consumption stages. On the other hand, there is food waste, which occurs toward the back end of the chain, that is at the retail and consumer level. While food loss is far more prevalent in the developing world, associated mostly with a lack of adequate infrastructure, food waste mostly occurs in developed countries. In fact, there tends to be a high correlation between a nation's GDP and its per capita rate of food going bad after being processed.

2. In terms of amounts, a 2011 study conducted by the Food and Agriculture Organization of the United Nations (FAO) showed that, by weight, around a third of all food produced for human

[1] The FSC of vegetable and animal commodities can be divided into the following five segments: (1) agricultural production, (ii) post-harvest handling and storage, (iii) processing, (iv) distribution, and (v) consumption.

consumption is lost or wasted. For Latin America and the Caribbean, the average per person amounts to nearly 225 kg/year. As the figure below shows, out of this amount, more than 85 per cent is lost in the pre-consumption stages.

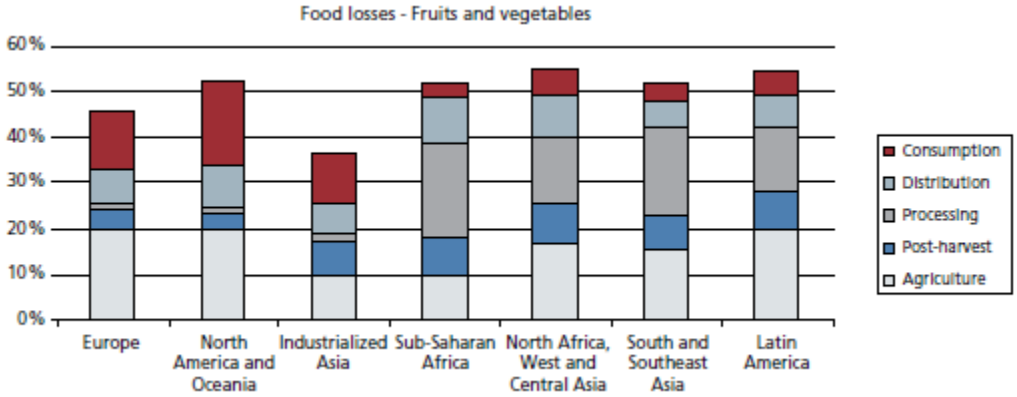
Figure 1: Per capita food losses and waste, at consumption and pre-consumptions stages



Source: FAO (2011) Global food losses and food waste – extent, causes and prevention

3. However, this picture varies greatly depending on the type of food. In the case of cereals, for instance, the study highlighted that most losses actually occur at the consumer level, while the percentage of fish and seafood that gets thrown away in individual households is much lower. More importantly though, as figure 2 below shows, the numbers highlight that the biggest driver behind the amount of food loss and waste are fruits and vegetables. While the percentage tends to be high in all regions, the situation in Latin America is globally the most acute, with nearly 50 percent of fruits and vegetables not even reaching the final consumer.

Figure 2: Part of the initial production lost or wasted, at different FSC stages, for fruits and vegetables



Source: FAO (2011) Global food losses and food waste – extent, causes and prevention

4. As referred to above, the causes of food losses and waste in developing countries are said to be mainly linked to financial and technical limitations. This applies to harvesting techniques, but also to storage and cooling facilities that are particularly relevant in the region's humid and warm climate and for easily perishable food types such as the mentioned fruits and vegetables.

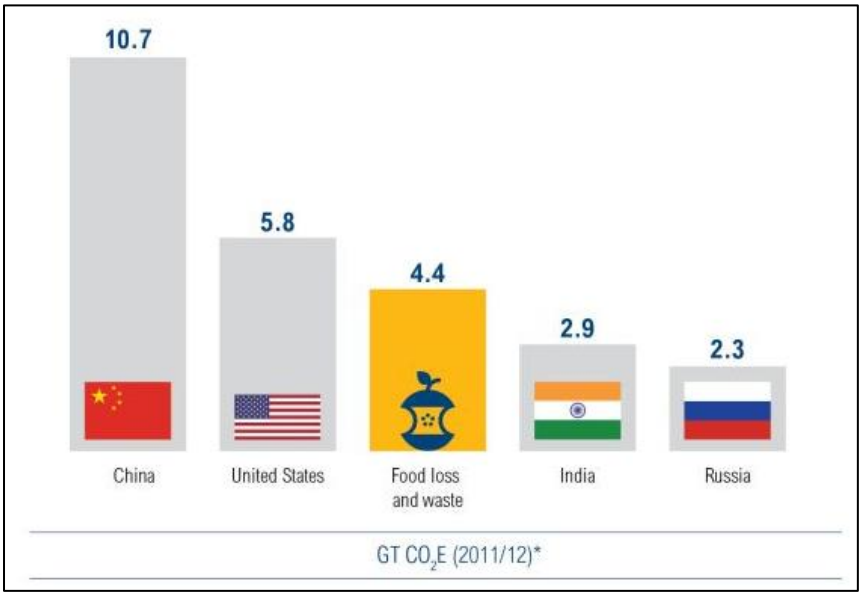
5. But food spoilage also relates to consumer behavior and a lack of coordination between different actors in the supply chain. Food can be wasted due to quality standards, which reject food items not perfect in shape or appearance, and inadequate farmer-buyer sales agreements can lead to direct losses of crops that will never even leave the farm. At the consumer level, insufficient purchase planning and expiring 'best-before-dates' also cause large amounts of waste.

6. This food loss and waste has serious impacts on personal and national economics. Globally, the FAO estimates that food worth about $940 billion is lost or wasted each year throughout the entire FSC. For sub-Saharan Africa, one of the world's poorest and most food-insecure regions, the World Bank estimates that just a 1 percent reduction in post-harvest losses could lead to economic gains of $40 million each year, out of which most of the benefits would go directly to the smallholder farmers growing the food.

7. But the global mismanagement of these types of consumables not only means a missed opportunity for the economy and food security, but also a waste of all the natural resources used for growing, processing, packaging, transporting and marketing the food. In fact, one issue that is often overlooked in the public discourse is that food loss and waste have a direct and very strong link to climate change.

8. According to figures recently released by the FAO, food loss and waste accounts for about 4.4 gigatonnes of greenhouse gas emissions per year (figure 3). To put this in perspective, if food loss and waste were its own country, it would be the world's third-largest emitter, surpassed only by China and the United States. When compared to other sectors, food loss and waste generates more than four times as much annual greenhouse gas emissions as aviation, and is comparable to emissions from road transport.

Figure 3: Greenhouse gas emissions linked to food loss and waste compared to the largest emitter countries



Source: World Resources Institute (http://www.wri.org)

9. The greenhouse gas emissions associated with food loss and waste come from a variety of sources such as: (i) on-farm agriculture emissions; (ii) the production of electricity and heat used to manufacture and process the food; (iii) the energy used to transport, store and cook food; (iv) the landfill emissions from decaying food; and (v) the emissions from land use change and deforestation associated with producing food that is ultimately lost or wasted.

10. While these facts are generally not news to experts and decision-makers, and information on amounts lost or wasted at each of the stages will often be available, there is very limited knowledge on what the concrete challenges are that cause for different commodities being spoiled at that time. Food lost at the beginning of the FSC may, for instance, be caused by a farmer's desperate need for money which leads to premature harvesting, but it can also be the consequence of a lack of adequate post-harvest storage facilities or poor coordination between the farmer and actors responsible for handling and transport. This information will most likely vary a lot from country to country and requires a much more in-depth analysis of processes at the micro level which is generally not available. However, without this information, it is virtually impossible to design national policy strategies that get to the core of the issues and tackle them efficiently. An immense opportunity lost for framing context-specific and effective mitigation measures.

11. Therefore, it is absolutely crucial to develop innovative consultation mechanisms to collect this first-hand information because what we do know is that the dividends of avoiding food loss and waste would have an enormous impact. Farming already uses almost 40 percent of the world's ice-free land, compared to just 2 percent for cities, and uses 70 percent of our fresh water. Not making a more efficient use of already existing resources would imply growing more food to feed the growing populations and increase greenhouse gas emissions even further. On the positive

side, pursuing food loss and waste reduction would help countries meet target 12.3 of the Sustainable Development Goals, the one calling for halving food waste by 2030.

12. In addition, even though the focus should lie on preventing food loss and waste, there is also a big opportunity when looking at this issue in terms of waste management. A report published by UNEP in 2011 shows that both in low- as well as middle-income countries the big majority of waste is organic and can therefore be redirected to non-food use such as compost, bioenergy, or animal food.[2] So even though this is the least preferred option, innovative solutions and partnerships among local communities, the public and the private sectors can lead to cost-effective methods to manage biodegradable waste.

13. Developing these innovative and sustainable solutions that are adapted to the various contexts calls for a concerted effort of all parties that are on some level involved in food production, handling, processing, distribution and consumption. And it is this type of generation of linkages and dialogue among multisectoral stakeholders that lies at the heart of the social innovation methodology promoted by the Innovation Lab (I-Lab).

14. The I-Lab is a platform that was created in 2008 by the Competitiveness and Innovation Division (CTI) of the Inter-American development Bank (IDB) and has since worked extensively on promoting innovative solutions with high social impact that were developed directly with and for individuals and institutions that find themselves affected by certain unattended problems.[3] The approach has been successfully applied to address a variety of issues such as access to clean water, renewable energy, disabilities and early childhood education and it relies on the development of tools that enable affected communities to communicate their challenges and needs. The process starts with a call for problems, using technology (crowdsourcing) and social research to reveal the needs of the beneficiaries, and then engaging universities, the private sector and other actors who have the knowledge and resources to generate new high-impact social innovations based on actual demand.

15. By applying the I-Lab's social innovation methodology, this TC will contribute to closing the knowledge gap around the causes of food loss and waste and support the implementation of innovative ideas on how to tackle them. Given the enormous amounts of greenhouse gas emissions associated with this phenomenon, innovative demand-driven solutions would not only be important for food security but also a crucial matter in the context climate change mitigation. The specific objectives of this TC are to (i) analyze the policy framework and market failures around the issue in a selected number of countries, (ii) develop platforms, both digital and analogue, to gather first-hand information on the causes of food loss and waste from those directly involved in the FSC, (iii) invite a broad range of multidisciplinary experts to develop innovative solutions to tackle the identified problems, and (iv) develop communication products

[2] According to FAO criteria, food that gets re-processed through these types of approaches would, however, still count towards the figures of food loss, since it was not put to the intended use which was human consumption.

[3] This condition of suffering from a specific social problem, currently unattended or insufficiently attended by both the public and the private sectors, is what the term "marginalized communities" alludes to. However, it has to be highlighted that this not only refers to communities in the traditional sense, referring to people sharing the same territory. It also includes people or institutions more in general that have a common denominator that goes beyond the area they live in, e.g. people with disabilities or single mothers in rural areas throughout the whole region.

and training events to disseminate the generated knowledge and build capacity in public agencies to subsequently replicate the methodology.

16. The activities will be implemented in the form of pilot projects in up to three different countries of the region, to be selected based on their expressed interest in and commitment with the topic, that could then be scaled up. There would also be a number of regional calls to ensure a broader reach and make use of the I-Lab's digital platform and the Bank's convening power. In addition, the knowledge generated through these pilot projects could be adapted to replicate this approach in other countries and other thematic areas, such as solid waste management and plastic recycling.

III. DESCRIPTION OF ACTIVITIES

1. **Component 1: Policy framework and market failure analysis.** Food waste is a global problem of staggering proportions, but the underlying reasons are very different from country to country. Therefore, this component will start with an in-depth analysis of the formal conditions given in those countries that have been selected for the pilot projects. In particular, it will finance an assessment of the existing policy framework with a view of identifying opportunities and challenges in the current management of supply chains, developing public private partnerships, enforcement mechanisms and quality standards. Based on this assessment, it also seeks to clarify which are the main market failures that prevent a more sustainable production, processing and consumption of food.

2. **Component 2: "Call for Problems" to identify challenges around food loss and waste among direct beneficiaries.** This component will apply the I-Lab social innovation methodology and launch interactive technology platforms and, if needed, more traditional field-based knowledge collection methodologies, to reach out to direct beneficiaries. These include, among others, farmers, logistics providers, restaurant managers and final consumer households and the objective is to gain a better understanding on what the main problems are that lead to food loss and waste at the various levels. International evidence[4] shows that the success of food waste reduction and recycling projects rests on the extent of involvement of the communities and the creation of multi-sectoral partnerships, which is exactly what this methodology intends to do and where digital platforms can be an important asset to give people a chance to voice their needs and connect the various worlds[5]. The ultimate goal is to identify those problems that can potentially be tackled through the application of innovative technologies. This call for problems

[4] There is, for example, a community-based project on waste management and composting in Bangladesh that, through the involvement of the private sector and the development of an innovative partnership and financing model managed to turn the organic waste into compost. This project is not only generating revenue and employment opportunities for people from the informal sector, but also reduced the landfilling budget of the city and contributes to more sustainable farming. The project was successfully registered as a Clean Development Mechanism (CDM) project under United Nations Framework Convention on Climate Change (UNFCCC).

[5] In this context, it is important to highlight that digital platforms do not only refer to the web 2.0. The concept also includes more traditional technologies such as mobile phones that, depending on the target group of the call, will be a much better instrument to ensure a broad reach and participation. Where necessary, these digital approaches will be complemented with activities such as focus groups and interviews, a dual strategy that has been successfully applied in previous I-Lab initiatives.

will generate the knowledge needed for the development of the third component – the call for solutions.

3. **Component 3: "Call for Solutions" to identify innovative, high-impact technological solutions.** This component will build on the same digital platforms to engage multidisciplinary stakeholders from the public and the private sector as well as academic institutions and civil society to propose solutions for the most voted problems, both in the area of waste prevention as well as recycling. This call will focus primarily on technological solutions out of which up to five most innovative and relevant proposals, prioritized through a panel of experts, will be financed in their pilot-phase. The panel will be composed of specialists on the topic from inside and outside the IDB as well as representatives of relevant government entities and private investors who will evaluate the pilot solutions' technical viability and scalability. In addition, there will be a feedback mechanism to ensure that beneficiaries who were consulted in the call for problems also participate in the development of the solutions. The initial seed funding for these technological solutions will be contributed by this TC.

4. **Component 4: Dissemination of results, partnerships and capacity building.** Since very little is known about the coordination failures that occur throughout the FSC, it is crucial to develop a solid communication strategy to disseminate the knowledge generated by this initiative. Therefore, this component will develop a number of communication products, from publications to audiovisual materials, and organize dissemination events to ensure that the lessons learned reach decision makers and also raise the awareness of society around the importance of reducing food loss and waste in the context of combatting climate change. This component will also finance consulting activities oriented at identifying and engaging potential collaborators in the process, as well as to leverage additional funds from private enterprises, NGOs, and public institutions to finance the pilot projects and scale up the social innovations. Furthermore, it will support training events (e.g. workshops, seminars, webinars) to consolidate local capacity to independently replicate the process.

IV. INDICATIVE BUDGET

Activity/ Component	Description	IDB Funding
Component 1	**Policy framework and market failure analysis**	35,000
Component 2	**"Call for Problems" to identify challenges around food loss and waste among direct beneficiaries**	70,000
Component 3	**"Call for Solutions" to identify innovative, high-impact technological solutions**	220,000
Component 4	**Dissemination of results, partnerships and capacity building**	60,000
Total		385,000

V. EXECUTING AGENCY

1. The executing agency of this technical cooperation will be the Inter-American Development Bank through the Competitiveness and Innovation Division (IFD/CTI) with cross-support from other sectoral divisions in the Bank. This is consistent with the TC's specific objective, and aims at completing the tasks at hand in a cost-efficient manner and ensuring the quality of the outputs. This arrangements also builds on the Bank's ability to execute multi-country technical cooperations and contribute with time and knowledge of the project team. Initial conversations have been started with colleagues in the Climate Change and Sustainable Development Sector (CSD) and the Multilateral Investment Fund working on similar topics to ensure coordination and explore synergies and areas for collaboration. Furthermore, as this initiative is conceived as a pilot, it will serve as a learning exercise for future projects on the topic throughout the whole IDB. The knowledge generated by this experience will also be disseminated in other LAC countries, therefore benefitting a broader range of stakeholders beyond the national limits.

VI. MAJOR ISSUES

1. Given the complexity of issues in the FSC management and the challenging nature of bringing together stakeholders with a broad variety of perspectives and vested interests, creating the right incentives for key players to participate in the dialogue is a challenge. It is therefore important to involve those institutions that are already actively working on tackling some of the issues, such as NGOs, farmers' associations and local governments, to build on their knowledge and networks. In order to not get lost in the details, it is also important to start out with some aspect of the FSC disconnect that is particularly striking in the respective national or local context, a topic that would be identified by the market failure analysis, or to focus on a particular commodity, such as cereals or meat that are particularly "carbon intensive".

VII. EXCEPTIONS TO BANK POLICY

1. There are not exceptions to Bank policies in order to execute this TC.

VIII. ENVIRONMENTAL AND SOCIAL STRATEGY

1. Given the nature of the program, there are no associated environmental or social risks. Based on the Environment and Safeguards Compliance Policy (OP-703) this operation is classified as "C."