



New Taipei City, Taiwan

Quito City, Ecuador

Municipality of Medellin,

Colombia

Metropolis Surplus Food



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Preface

According to the statistics released by the Food and Agriculture Organization of the United Nations (FAO), one-third of all food produced globally, which amounts to 1.3 billion tons, is wasted annually, but only one-fourth of the wasted food is required to solve the problem of hunger in the world. With the rapid growth of global population and climate changes, food problems are becoming prevalent, warranting immediate attention. For this, reducing food wastage (i.e., food waste and food loss) is essential.

In cities, the continual development impedes food wastage reduction; consequently, the seriousness of this problem is increasing. FAO reported that the post-consumption food waste in the developed regions of North America, Oceania, Europe, and East Asia accounts for >30% of the total food production, whereas in Latin America, North Africa, and Central Asia, it accounts for <15% of the total food production. In developed countries, people may have easy access to relatively cheap food and therefore may not value the food. By contrast, in developing countries, the limitations in food preservation and transportation lead to a large amount of food potentially being lost at the place of production or during transportation. Therefore, in these countries, people at the bottom of the economic pyramid, who have difficulty in acquiring food, consider food valuable. Numerous cities have been emphasizing the importance of food wastage reduction, and the New Taipei City Surplus Food Network (NTCSFN) established by New Taipei City Government received attention from the World Association of Major Metropolises. New Taipei City Government exchanged opinions and experiences regarding food policy promotion with Quito, Ecuador and Medellin, Colombia through the Metro Surplus Food Program; the related experience and comparisons are collated in this report, which can serve as a reference for other cities to promote similar programs.

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I. Introduction

1.1 Background of the Metro Surplus Food Program

FAO reported that one-third of the food produced annually worldwide is lost or wasted, whereas 700 million people are live in hunger. Despite the advancement of agricultural and food technologies, the problem of hunger persists. By 2050, food production must increase to 106% of that in 2005 to meet the need of the growing global population.

Although problems concerning global population increase and food wastage are emerging, most people worldwide neglect the importance of food, leading to the persistence of food wastage. In European countries with high economic development and the United States, the standard of living is high and people have easy access to various foods; thus, the primary food-related problem here is post-consumption food waste. The pursuit of high quality of life, increase in health awareness, and change in consumption habits have resulted in the increase of the amount and types of food being wasted and lost.

In addition to developed countries, developing countries such as those in Latin America and Africa have serious food wastage problems. In these countries, because of the lack of local production planning, facilities and money for food preservation, processing, and transportation, locally produced food cannot be properly transported to areas far from the place of production. This leads to the food being lost in the place of production or during transportation. When the limited amount of food finally reaches consumers, its price is increased;’ this impedes the economically disadvantaged people from accessing normal, healthy food. Thus, people living in poverty can access only the cheap, low-quality processed food, and thus, in the long term, they easily develop health problems, which further deteriorate their living and working abilities and trap them in poverty.

1.2 Necessity of food-saving strategies

Food waste and food loss exist simultaneously, but the solutions to these problems have not been effectively integrated. Therefore, food management, at the front end, and food use, at the back end, must be first considered when countries formulate strategies for food wastage prevention.

Food-saving strategies seem to be used only to reduce food waste and solve environmental problems. However, if foods are considered “resources”, they can be collected and integrated using numerous methods applicable to various fields. Therefore, food-saving strategies would be conducive to environmental protection, economic development, and welfare.

Food disposal as waste incurs economic and environmental costs. By contrast, food collection and redistribution can reduce not only food suppliers’ food-processing costs but also food

expenditure of people who receive the food; it also facilitates environmental protection. Considering the serious threat of climate change and population explosion, cities must pay attention to resolving food problems and developing relevant food wastage–reduction strategies.

1.3 Partner cities in the Surplus Food Pilot Project

The Surplus Food Pilot Project involves three cities: New Taipei City, Quito, and Medellin. The food-saving strategies implemented by the three cities are discussed in the subsequent sections.

(1) New Taipei City

The NTCSFN collects vegetables, fruits, and meats with unfavorable appearance in the New Taipei City markets and sends them to the city’s schools with departments of food and beverage management for processing; the processed food is then distributed to social welfare services. To enhance citizens’ identification with and participation in the food-saving activities, the concept is promoted through education, various channels (e.g., restaurants and businesses), and relevant activities, thereby reducing food waste in the city.◦

(2) Quito

To solve the problems of poverty and malnutrition in the city, Quito started to promote the construction of an Agrifood Strategy, inspired by the Milan Urban Food Policy Pact (MUFPP), 2 years ago. This strategy addresses the reduction of food loss and waste as one of its 5 strategic axes, and some important steps have been taken: (1) In September 2017, FAO Ecuador began a discussion on “Sustainable Agrifood Systems and Reduction of Food loss and Waste” and the loss and waste of food has been included in the measurements of the National Institute of Statistics and Censuses INEC. (2) In 2018, FAO measured the food loss Ecuador though not yet presented. With the result of the national diagnosis of losses, a proposal will be presented to the National Assembly (Congress) for the elaboration of a specific law.

(3) Medellin

The School Feeding Program [Programa de Alimentación Escolar - PAE] is a state strategy that promotes the permanent access of children, adolescents, and young people to the official education system. It works by providing a food supplement during the school day to maintain attention levels, positively impact learning processes, reduce absenteeism, and promote healthy lifestyles.

Medellin has established a food and nutrition security team, which plans and implements food and nutrition security–related strategies. Medellin government also collaborates with private organizations as Archdiocesan Food Bank Foundation of Medellin (FUBAM) and the Antioquia Food Bank of SACIAR Foundation, both of which are members of the Food Bank Association of

Colombia (ABACO), to alleviate food wastage and thus remedy hunger and malnutrition among disadvantaged communities.

1.4 Conference list

1. First online meeting with partner cities on January 19, 2018
2. Surplus food workshop in Quito on October 1–3, 2018
3. 2019 Metropolis Surplus Food Pilot Project Workshop in New Taipei on August 27-28, 2019

II. Food Security and Surplus Food Program in New Taipei City, Quito, and Medellin

2.1 Environment and background of the three cities

(1) New Taipei City

New Taipei City is located in Northern Taiwan, adjacent to Taipei City. It comprises 29 administrative districts and covers urban and mountainous areas. Because a large proportion of its residents are from other cities, New Taipei City features high cultural diversity. By May 2019, the total population of New Taipei City exceeded 4 million, rendering it the most populated city in Taiwan. In particular, the number of low-income households was 37,194, accounting for 1% of the total population of the city. New Taipei City encompasses a vast area with diverse industry types, ranging from the primary sector (e.g., agriculture and livestock farming) to the tertiary sector (e.g., finance and business). Moreover, because of its convenient and well-developed intracity and intercity transportation system the city can conveniently obtain agricultural produce and other food products from other cities and counties at a relatively low transportation cost in the highly competitive logistic market.

To ensure the stability and safety of its citizens' life, New Taipei City has been developing welfare policies for various population groups, including older adults, underprivileged people, people with disabilities, and children. For the factors that cannot be covered by the government's welfare system, relevant social-welfare and other private organizations help the government in implementing various programs, such that resources are flexibly provided to people in need. Individual donations to facilitate program implementation are also accepted.

(2) Quito

Quito, Ecuador is located in the northern area of the Andes at an elevation of 2,850 m and has a population of 2.96 million people, which accounts for 15% of the national population. The city has an unemployment rate of 9.4% and underemployment rate of 11.7%, which has positive correlation to the poverty rate. Among the 12.8% people living in poverty and 4.6% in extreme poverty (according to income level), there are still 30% of them who are unable to meet the basic

needs of daily living. Moreover, 30% of children under age 5 experience long-term malnutrition.

Quito meets the decent living standards based on different social indices, however, regional development in the city is extremely uneven. Quito has abundant agricultural produce; nevertheless, because of the lack of appropriate infrastructure for food storage, food quality analysis, and food preservation, a large amount of agricultural produce is lost after harvest. Regarding post-consumption food waste, among the 1,906 tons of solid waste produced daily, 57.7% is household organic waste.

Considering the food wastage and child malnutrition, Quito government has proposed a Food Strategy which includes food loss and waste as one of its axes of action. Most of the actions carried out later in Quito come from civil society, the academy and some initiatives in a few restaurants.

(3) Medellin

Medellin, is located in a valley in the northern area of the Andes at an elevation of 1,541 m and has a population of 2.5 million people, which accounts for 12% of the national population. The city of Medellín was affected by currency depreciation in 2015. The unemployment rate in the job market was as high as 13.5%. The multidimensional poverty index in the city was 12.7% in 2018, and 2.9%

of the population in the city did not reach the daily living expense standard of 1.6 US dollars. It is Colombia's first energy generator, the main banana and coffee grower and exporter, and one of the largest gold producers and the economic centers.

Medellin, a rail and transportation hub with an international airport, affords convenient outbound transportation. However, the agricultural produce harvested in the rural area of Medellin is easily lost during the delivery to the market. The city government surveyed the amount of crops and

City	New Taipei	Quito	Medellin
Area	2053 km ²	372.39 km ²	380.6 km ²
Population	4.01million	2.69 million	2.5 million
Population Density (per km ²)	1953.2/km ²	7223.6/km ²	6568.5/km ²
Poverty Rate	1%	13%	2.9%
Poverty Index	1. Daily living expense is under 16.3 US dollars. 2. Personal property is under 2500 dollars per year. 3. Household real estate is under 181 thousand dollars.	1. Daily living expense is under 1.6 US dollars. 2. Unable to meet the needs of education, residential demand and basic living needs.	1. Daily living expense is under 1.6 US dollars. 2. People at high risk in social and mental aspects and those with disability
Cross-department cooperation	Yes	Yes	Yes
Cooperation with private sector (Note 1)	Easy	More difficult	More difficult
Combination with public welfare	Yes	Yes	Yes
Note 1: New Taipei City has relatively easy access to cooperation with private sectors because of the encouragement to good deeds in the traditional culture. Quito and Medellin need legal regulations to ask for the cooperation.			

Comparison Chart of 3 Partner Cities

waste produced in the five agricultural regions—namely San Sebastian de Palmitas, SanCristobal, Altavista, San Antonio de Prado, and Santa Elena—and found that post-production food loss accounted for a large proportion of the total food lost in the entire production chain.

Regarding civil participation, FUBAM and the Antioquia Food Bank of SACIAR Foundation are committed to reducing food wastage in the production chain and providing food to older adults and children in community canteens.

2.2 Food security and food-saving in New Taipei City, Quito, and Medellin

In New Taipei City, agricultural production is not a primary function. However, because it has convenient transportation system and abundant business development, people can easily obtain diverse low-priced foods that meet their needs. In addition, it has many restaurants with variable price ranges—from affordable to expensive. With the change of modern lifestyles and the pursuit for convenience, the frequency of eating out has increased. However, because most of the food is highly affordable, people may order too much to satisfy their food cravings. This leads to leftovers, which the restaurants are required to discard. Moreover, only foods that appear good are sold in the market to attract consumers, whereas those with unfavorable appearance are discarded before they reach the market. This is because customers may not be willing to buy foods with unfavorable appearance, eventually leading to them being discarded. In 2018, the amount of food waste in New Taipei City was 26,028 tons. In addition, the statistics of the Department of Environmental Protection demonstrated that the amount of kitchen waste was 140,000 tons. However, only food waste from shops and businesses is reported, but that in normal garbage or that being disposed by private units remains unaccounted for. Therefore, the total amount of food waste may be higher than that recorded in governmental statistics.

In Quito, a large amount of food is lost in the place of production and during their delivery to the market because of limited transportation and preservation facilities, which increases the food price in the market. Household waste accounts for 60% of the total solid waste in the city, most of which is food waste resulting from unplanned purchase. However, 30% of the population in the city are still unable to acquire normal food stably. In remote areas, Venezuelan migrant families even need to ask for money on streets for food and other necessities because of starvation. In Medellin, food is also lost during transportation from the place of production to the market. However, the city government has constructed a collaboration network along the production chain to reduce exploitation, increase producers' income and decrease food loss. It has also established food banks, which directly collect food from the place of production to reduce food loss and provide the food to older adults and children in community canteens to alleviate hunger.

In New Taipei City, disadvantaged people do not experience serious hunger, but they only have

limited money to buy food. Although they can obtain food from social welfare organizations or governmental agencies, the food is mostly donated and comprises food products that can be stored for a long time, such as canned food, instant noodles, biscuits, and microwaveable food. These food products contain more artificial additives than other natural foods do. Therefore, although these foods can alleviate hunger, their long-term consumption may pose chronic threat to disadvantaged people's health. Therefore, an objective of the NTCSFN is to solve nutritional imbalance among the disadvantaged people.

In Quito, most of the foods provided to the disadvantaged people in the children centers and food banks are fresh foods. In Medellin, the food provided in the food banks to community canteens is mostly directly collected from the places of production. This strategy aids in alleviating hunger of the disadvantaged people, in providing nourishment to them, and in maintaining their health, which is considerably different from that in New Taipei City.

2.3 Strategies adopted by New Taipei City, Quito, and Medellin

2.3.1 Successful strategies

(1) New Taipei City

The NTCSFN is an interdepartmental network in the city government, where various departments are responsible for different aspects of surplus food promotion and initiatives. The NTCSFN mainly focuses on public welfare; therefore, the Social Welfare Department is the major one in charge of its operation, including the management of food matching, sorting, delivery, and coordination between departments. For example, qualified markets and food companies will be picked by the competent authority, followed by a discussion of the collaboration model with the Social Welfare Department. After the market is included in the network, volunteers are appointed to assist with sorting and allocation at a fixed time point and location; the food is then delivered by trucks or taken away by neighboring communities.



Volunteers sort out fruits and vegetables at the market every week.

To reduce food loss due to spoilage and damage, the Social Welfare Department commissioned the private sector for two refrigerated trucks to facilitate food transportation. Subsequently, because of the increase in the types of food, including meat and processed foods (e.g., hotpot ingredients), being

(2) Quito

Quito is the first city in the country that has worked with a multi-stakeholder platform to address various issues related to the food system, including food loss and waste.

This theme has been integrated into the Agri-Food Strategy of Quito as a specific axis of action to address the issue of food loss and waste that seeks to:

1. Raise public awareness of food loss and waste.
2. Establish technical and operational strategies for the management of waste and / or organic waste.
3. Foster research, innovation and technology transfer aimed at reducing food loss and waste.
4. Promote strategic alliances between the private and public sector for the measurement, reduction, rescue, recovery and redistribution of food.
5. Promote the circular economy through the management of organic waste with emphasis on the inclusion of vulnerable groups.
6. Support the national and local process for the creation of a Public Policy.

Quito is one of the 3 cities selected by FAO and the Milan Urban Food Policy Pact MUFPP for the Pilot project of implementation of indicators, the city has selected 2 indicators related to losses and food waste:

42. Annual number of events and campaigns aimed at decreasing food loss and waste.

44. Total annual volume of surplus food recovered and redistributed for direct human consumption.

The school garden program supported by the urban agriculture project AGRUPAR of the Municipality of Quito encourages teachers and students to familiarize with the nature and obtain environmental education in ecological orchards. Since 2017 the national government has promoted the TINI project "Land of Children" that complements and strengthens AGRUPAR's intervention in schools)

This intervention in schools considers waste separation, composting, food production and consumption of healthy food. Furthermore, "Guagua Centros" were established in numerous areas, where provides exercise and



Guagua Centros

learning activities, for children aged 1–3 or 1–5 years in disadvantaged families to enhance their intelligent development and ability. These centers provide four meals a day based on the ingredient lists provided by professional dietitians to ensure the children to have balanced nutrition. In addition, one childcare worker is hired for every 10 children in each center. The childcare workers are trained in child care and cooking.

Based on the Pichincha agroecology regulations, the government promotes the use of organic compost, processing of food not meeting the standards of freshness for sale, and use of food scraps to feed animals. In addition, vocational training centers have been established to provide baking and cooking workshops to encourage community residents to start their own businesses.

The local regulations of the Municipality of Quito establish through its Ordinance 084 “Social Responsibility”, the practice of responsible consumption (understanding that the scope of this criterion includes the reduction of food losses and waste), for which there must be co-responsibility of citizens and a high participation of the business sector.

On the other hand the Master Plan for Integrated Waste Management by 2025, proposes: reduce waste generation by 5%, reuse, recycle or treat 25 and build a compost plant (Does not integrate quantification and rescue of food for redistribution specifically).

The Agri-food Charter of Quito, signed in 2017, was proposed by the multi-stakeholder platform Agri-Food Pact of Quito, in order to sensitize the city through 17 objectives that propose changes to the food system, two of which are directly related to Goal 12: Prevent and reduce food losses and wastes, through innovations along the chain, as well as less use, reuse and recycling of containers, by raising public awareness, promoting responsible consumption, separation in the source and classification of waste, rescue and redistribution of food still suitable for human consumption and the use of organic waste.



Guagua Centros Offers Meals for Kids

The Municipal Urban Agriculture Project AGRUPAR, with support of the IDÓNEA campaign (civil society), urban, peri urban and small rural farmers have been raised to donate leftover food from fairs where they sell their products for preparing meals to vulnerable groups. Farmers process surplus production to avoid losses and waste. Organic waste is composted to maintain the fertility of the crop soil

The Wholesale Market of Quito Do not donate the market directly but if the merchants that sell within it, 11.70 tons per month of fruits, vegetables and tubers are donated to support the management of 8 foundations (NGOs) related to the attention of vulnerable groups.



Staff in the Kitchen of Guagua Centros

(3) Medellin

The School Feeding Program-PAE is executed approximately in 479 educational establishments of the different neighborhoods and districts of the city, both official and contracted by the Ministry of Education. There are some educational establishments with more than one modality of attention providing a greater coverage in the attention of schoolchildren.

The school feeding program offers several types of food supplements, such as the morning food supplement, the afternoon meal supplement, the lunch type supplement especially provided in the rural areas, and the School Milk Glass supplement. These supplements are offered according to the portion mode prepared on site or industrialized portion.

The food supplement offered under all modalities is provided from Monday to Friday on school business days, which complements the food that the student must receive daily at home.

PAE proposed the gastronomic component to help to improve its service, allowing the assessment of the person responsible for preparing the menus in each educational establishment where it operates. This component provides training through educational strategies which include the Practical Gastronomic Accompaniment or APG in Spanish, measurement of leftovers, standardization of tools for the portion served, support for the review and completion of the Kardex, development of Practical Gastronomic Workshops, participation in Mobilizations and Educational Closures. Also, it includes the possibility for

those in charge of the preparation of food to apply knowledge and practices in favor of PAE.

This program has other actions as shown below:

The Educational and Complementary Actions Project. Its purpose is to strengthen capacities within the educational community that allow for a better implementation of the School Feeding Program and contribute to the adoption of healthy habits and lifestyles in children and adolescents and their families through the implementation of educational strategies in the coverage institutions of the city of Medellín.

Public Board of SAN-MPSAN¹. This scenario was created and convened exclusively to disseminate, socialize, generate a feedback, and validate the SAN offer provided by ESAN. It is a scenario conceived to make visible the actors (community and institution), who participate in the execution of ESAN programs and projects or its beneficiaries. Likewise, instances such as the School Feeding Committees-CAE, the SAN Committees and the citizen oversight, can socialize in this scenario the results of their management in relation to their participation or social control exercise. This space also summons the operating, intervening and supervisory instances of the different projects when the object of the call so requires.

SAN-MTSAN Technical Table. The Technical Board of SAN is conceived as the participation scenario that allows institutional actors with interference in SAN, join efforts, analyze and arrange joint actions, socialize experiences and achievements and incorporate, feedback and contextualize technical guidelines that enhance the development of actions in SAN.

School Feeding Committee -CAE- As referred to in Resolution 16432 of 2015, the School Feeding Committee, “is one of the spaces promoted by the Ministry of National Education to promote citizen participation, sense of belonging and social control during the planning and execution of the School Feeding Program –PAE-, which allows to optimize its operation and thus contribute to improving the attention of children and adolescents.”

To build up transparent relationships among consumers, businesses, and places of production involved in food transactions and related transportation, marketing, and consumption, the percentages of agricultural produce and waste in the major agricultural production areas in Medellín are first analyzed, followed by the percentages of food traded and wasted in the market. The methods of waste management in commercial areas are then examined (e.g., transport to the recycling centers, burned, or collected by garbage trucks).

¹ Food Security Unit - Municipal Plan for Food and Nutrition Security

After understanding the food waste status in Medellin, the FUBAM and Antioquia Food Bank of SACIAR Foundation directly collect food from the places of production to reduce the food wastage along the supply chain. The collected food resources are then allocated or processed and delivered to communities.

2.3.2 Other current programs

(1) New Taipei City

The NTCSFN collects and redistributes food to the public as well as implements various food waste–reduction programs through education and collaboration with private businesses.

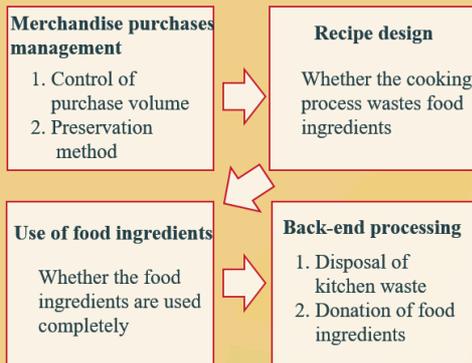
Because most children receiving compulsory education have school lunch daily, a huge amount of food is required for lunch by a total of 298 schools in New Taipei City. However, students' eating habits and preferences for certain dishes lead to a large amount of leftovers. Accordingly, the “Empty Plate Movement” has been launched; this program reduces food waste by providing students a fixed quantity of food and receiving feedback from school lunch suppliers regarding students' food preferences. The Education Department of New Taipei City Government has developed a dish scale corresponding to the nutrients necessary for school students of all ages. On the basis of this dish scale, the students are provided a fixed amount of food, and they are allowed to ask for more only when the amount is insufficient for them. This measure increases the proportion of students finishing all the dishes in their meal. In addition, lunch suppliers are asked to be responsive to the feedback regarding the dishes to reduce the food waste resulting from students' dish preference. The unconsumed food is packaged and refrigerated and later provided to students from disadvantaged families to bring back home as their dinner.

According to a national survey on eating out conducted in November 2018 in Taiwan, of the people aged 25–35 years, 94% ate out every week and 58% had at least one such meal daily. Considering the high percentage of citizens eating out, the Department of Health of New Taipei City Government has collaborated with banquet restaurants under its jurisdiction and implemented the “Leftover Packing-Up Project.” In this project, waiters provide suggestions regarding the quantity of food to prevent customers from ordering too much. After the meal, the waiters also encourage customers to pack up the leftovers. Moreover, the Department of Health cooperates with catering-related experts to design a surplus food recipe, thus teaching people how to make the leftovers into delicious meals. The Agricultural Department cooperates with small restaurants and encourages them to purchase unfavorable-appearing but organic vegetables and fruits grown by smallholder

farmers. This aids in stabilizing the sales channels among young organic farmers. In addition, some restaurants provide places for people to collect the vegetables and fruits with unfavorable appearance they have ordered; this strategy reduces farmers' costs involved in the traditional production–distribution model.

Guidance Evaluation of Green Cycle Stores

Integrate "surplus-food" and assess the operation process.



Guidance Evaluation of Green Circle Shops

New Taipei City Government holds the annual event *Christmasland*, which attracts a large amount of crowd. To enhance the visibility of the food-saving concept during *Christmasland*, the Department of Agriculture holds the event *Surplus Food Sharing*, where businesses related to surplus food sharing are invited to run booths. Relevant activities and short talks are also arranged to enable citizens to understand the concept and importance of food-saving.

(2) Quito

Nutritional imbalance is a major problem in Quito. Although the problems of hunger and malnutrition in children have been partially solved through Guagua Centros, adults aged 28–55 years commonly have overweight problems and obesity.

Therefore, in 2015, Quito government began establishing health-screening stations in populous locations within the city, wherein nutritionists provide a free nutritional status analysis and risk detention of chronic non-communicable diseases. The health report,

Through the accreditation of green circle shops and incorporation of food-saving into the accreditation indicators, the Department of Environmental Protection conducts inspection and provides relevant support for restaurant chains and hotel restaurants regarding their control and management of food ingredient purchasing, menu planning, and unused food ingredient disposal. The outcome has indicated that food waste reduces by at least 80 tons annually.



Surplus food initiative at the booth of the Christmasland

which is sent to the person via e-mail, includes not only their health checkup outcomes but also appropriate diet advice based on the person's health conditions and a reminder of receiving regular health checkup. Some health-screening stations are located in spacious places such as parks. Therefore, the health checkup events may be held simultaneously with other activities, such as organic markets and aerobics workshops, for the general public to participate. By September 2018, Quito has set up 26 health screening stations, with the service usage being 20,000 times per month, mostly by young people. The current municipal administration closed the program in May 2019.



Health Checkpoint in Park



Nutritionist Provides Public Consultation

(3) Medellin

To prevent massive planting of the same species of crop and maintain the city's food self-sufficiency and the balance of various foods supplied to the city, farmers in Medellin are required to register to the city government and confirm the type of crops they can grow according to an assessment of the regional needs. In Antioquia, supply-demand imbalance results in the reliance on food import, leading to increases in transportation cost, food wastage, and unstable quality and quantity and causing consumers to pay higher price to buy food.

Medellin government has attempted to solve the aforementioned problems by enhancing farmers' operation model and the collaboration between different stakeholders. Formal and informal participants in the agricultural production chain, including farmers and farmer organizations, collaborate with each other to acquire adequate techniques, knowledge, training, and total production plans, so that they have working capital in the production cycle and can develop brands for local products. This method can not only facilitate the integration between small- and medium-sized production associations and the confirmation of their needs but also increase the competitiveness in productivity and land and prompt knowledge exchange, thereby enhancing farmers' social and political role in the local

community. Therefore, farmers can acquire profits, waste can be reduced, and market price can be stabilized; this ensure that consumers can access affordable and safe food.

The project Alianza por el Buen Vivir [Alliance for a Good Living] represents the common interest between the Medellín Mayor's Office, the Office of the Governor of Antioquia, and the Metropolitan Area of the Aburrá Valley, because it improves the situation of the countryside and the quality of life of the countrymen from Antioquia and all the actors that make up the food distribution and supply chains.

The intervention is based on the development of associations and networks that improve the social fabric and optimize productivity and economies of scale. Also, it seeks to impact not only at the social level, but at the entire natural system from environmental sustainability. At the same time, these projects are developed in alliances or partnerships with private and social entities that allow greater response speed, knowledge transfer, continuity in the processes, and better risk management, and distribution.

This city-region articulation initiative arises from the need to minimize market failures in the fresh and manufactured food sector. These market failures include high intermediation costs, asymmetric information, monopolistic structures, and negative environmental impacts (externalities), among others. Taking into account that there has been an increase in food prices in recent years and they show increasing volatility. It is very important to consider the role of family farming as a food supplier, poverty alleviator, and refuge against economic and environmental impacts.

The intervention is developed through different activities that are grouped into four major components: production, commercialization and distribution, environment and ICT's. The first component includes the technical support and the improvement of technology and productive infrastructure; the second involves a process of training and technical assistance to traders, shopkeepers and consumers, implementation of logistics centers of distribution and/or municipal supply center, marketing and services operating in the neighborhood Campo Valdes in the city of Medellín. The third component is transversal to the production and commercialization of food and focuses on the implementation of environmentally sustainable actions, such as the management of losses and waste, in all links of the system. Finally, the technological component contemplates the development of a technological platform that allows articulating the supply and demand for food. A scheme that summarizes the intervention model of the project is attached below:



2.3.3 Cooperation with grassroots organizations

(1) New Taipei City

The New Taipei City Government–private sector collaboration can be divided into three stages: (1) matching, (2) sorting and transportation, and (3) utilization. In the first stage, Health Departments, Agriculture Department and the Market Division of Economic Development Department assist in the matching. Specifically, the Banqiao and Sanchong markets of the New Taipei City Fruit and Vegetable Marketing Co. Ltd. serve as fair-trade platforms of agricultural produce between farmers and wholesalers. A large amount of fruits and vegetables circulate in these markets during the workdays. After purchasing a large amount of fruits and vegetables, vendors may select produce with unfavorable appearance and provide them to the NTCSFN. Local private and public markets may also donate the unsold food ingredients, such as meat, vegetables, fruits, and seafood, at specific time points and locations. These ingredients are then delivered by food companies to community service sites in the food transport vehicles.

In the second stage, food donated by market vendors is sorted by volunteers arranged by district offices and the Department of Social Welfare. The volunteers discard food that is completely unusable and allocate the remaining food according to the need of each site. The allocated food is then delivered to each site by the “surplus food vehicle.” The city government has commissioned Chinese Christian Relief Association to be in charge of the personnel and relevant management for the surplus food vehicles since 2017 because of the association’s abundant experience and professional division of work. This can not only save the government’s effort to explore in this area but also stabilize the program’s operation through the exchange of experience and thoughts during the collaboration

between the government and the associations.

In the final stage, food is delivered to community service sites that hold congregate meals. The government also cooperates with social welfare organizations and churches that organize congregate meals for older adults or those providing academic assistance to children, so that the food can be fully used. From August 2016 to July 2019, 356,531 kg of food was used for such social services and it benefited 421,060 people.

(2) Quito



Food Bank in Quito

Quito's food banks can recover approximately 5 tons of food per week on average; it mainly comprises vegetables (78%), followed by meat (11%), fruits (6%), and flour and dry grains (5%). Unlike the program implemented by New Taipei City, these food banks need to collect food stand by stand in markets and then appoints volunteers to sort the food, which is then delivered to 45 foundations(NGOs) providing services to older adults, students from low-income households, and disadvantaged families. The food is also delivered to care centers for children aged <5 years and provided to families who receive resources from the food banks weekly. Some donated food is processed and

made into fruit and vegetable purees, jams, or seasonings. The processed food products are sold to the service recipients of these food banks at a price only 10% of the market price.



Refrigeration Facilities for Food Preservation



Processing to extend food preservation

148 "Guagua Centros" were established by October 2018; this number is expected to

increase to 200 in 2019. Some centers have been established free of cost in properties provided by the private sector, based on a 1-year agreement signed by Quito government and the property owners; this agreement is renewed annually.

Children receive 4 meals a day, however, the rescued food could not match the nutrition-balanced needs of these children's meals. Therefore, the municipality still has to budget for the food provided in the centers.

The elderly care program promoted by the municipality of Quito could integrate cooking schools and receive food donations to support the preparation of community meals. Currently food is bought with funds from the beneficiaries themselves, who cook on special occasions.

In hotels, restaurants, and cafes in Quito, on average, 30% of the food is wasted during preparation; in these cases, food may be discarded because it is overcooked or does not meet the standards. To reduce this waste, some businesses are gradually changing their approach; for instance, they are creating innovative dishes by using the ugly produce to reduce waste. The food courts in large shopping malls typically have no regulations regarding the disposal of kitchen waste and leftovers. Therefore, some restaurants collect the vegetables and fruits discarded during the meal preparation and send them to environmental managers; the scraps are eventually fed to pigs. Some local residents use household organic waste as compost, and a few residents donate their surplus food to local foundations at the end of the day.

As for recycle, the municipality of Quito opened an integral space in a city park (orchard / greenhouse, composting area, classroom) "Quito to recycle program". Everything that is produced in the garden is donated to the Food Bank of Quito. This is an educational space for the community on good practices of waste separation and their use. Composting is done with the organic waste from the wholesale market in Quito (it has been achieved that there is a proper separation of waste).

(3) Medellin

The FUBAM and Antioquia Food Bank of SACIAR Foundation, both ABACO members, are dedicated to reducing food wastage along the industrial chain, increasing their social influence, and mitigating the environmental and economic influence. As nonprofit organizations (NPOs), the food banks recycle surplus food and distribute the food to those in need. However, rather than providing food directly to those in need, the food banks provide food to social service organizations. Through the ABACO, the food banks cooperate with public and private sectors and nongovernment organizations, enabling themselves to be active domestically and internationally and contributing to the resource

management regarding materials and technologies and the reduction of food loss. The food banks are devoted to food and nutrition security for disadvantaged groups in Colombia. Currently, the FUBAM and SACIAR Foundation have 18 food banks, which provide services to 303 local governments in Colombia.

Through the Agricultural Surplus Recycling Plan (REAGRO), the Antioquia Food Bank of SACIAR Foundation obtained 3,222 tons of food directly from the places of production in 2017 and provided 5,653 tons of food to 618 social service organizations and 13 community canteens for older adults and children.

The Nutriamor Foundation, founded by SACIAR and a private institution, conducted research and development on the surplus agricultural produce in the place of production and developed a nutritional supplement containing proteins, vitamins, and minerals with banana as the base. The supplement is now available at community canteens for older adults and children. In addition, the Nutriamor Foundation converts the surplus agricultural produce into various foods including puree, corn tortilla, soup, butter, and baked goods. The FUBAM collects the surplus food and donates the food to REAGRO, which distributes it to 140 organizations.

The volunteers in the food banks not only manage donors, resources, and beneficiaries but also apply their expertise such as food preservation and system management to improve the operation of the food banks through offering training and technical transfer to other volunteers.

III. Challenges and gains for New Taipei City, Quito, and Medellin during their implementation of food programs

3.1. Current social welfare systems

In New Taipei City, the existing social welfare system for protecting the basic living of disadvantaged groups focuses on disadvantaged people, older adults, people with disabilities, children and adolescents, and families in emergency circumstances. The most direct support for these disadvantaged groups is granting subsidies and relevant exemptions (e.g., exemptions from National Health Insurance premiums and public childcare fees).

Quito has adopted similar measures to sustain the basic livelihood in low-income households. The national government grants monthly subsidies for different groups in low-income households, including older adults, minors, and people with disabilities. In addition, the Joaquin Gallegos Lara Benefit is offered to people with physical or mental disabilities or psychosocial disabilities at low socioeconomic status, people with rare diseases, and HIV carriers aged <14 years.

None of these bonds condition the purchase of food. The World Food Program through its

bonus for migrants and refugees is the only monetary transfer that is conditioned on the purchase of food.

The high migration of Venezuelan population to Ecuador and its main cities (Quito) has generated a crisis in such a way that municipal shelters can accommodate this population for only one week and guarantee 3 daily meals.

Although multiple types of subsidies are available for various groups in need, the provided subsidies may not fully meet the actual needs of these people. In New Taipei City, to solve this problem, social workers visit the households who apply for the subsidies to provide assistance and resources according to their actual needs. However, possible problems include inappropriate use of granted subsidies and reliance of disadvantaged households on the monetary assistance provided by social welfare services; these problems can eventually cause welfare resource depletion, thus affecting the basic livelihood of these people.

In contrast to the aforementioned cities, Medellín has adopted a nonmonetary strategy. On the basis of the food and nutrition policy, Medellín government provides various care programs for citizens at different stages of their lives (e.g., pregnant women, young children, schoolchildren, older adults, and people with difficulty in obtaining food), thereby alleviating the food problems and malnutrition.

Therefore, governments must consider increasing the diversity of social welfare schemes based on the needs of disadvantaged people, solve the problem caused by the one-size-fits-all welfare model, and ensure that resources are used efficiently. The Surplus Food Pilot Project was therefore designed to increase the diversity of social welfare programs by targeting food problems.

3.2 Challenges of dealing with surplus food

3.2.1 Challenges regarding resource integration in program operation

a. Business considerations from the supply side

In New Taipei City, food-related businesses require to pay a fee to dispose organic waste, including produce with unfavorable appearance. If the organic waste can be reused through donation, the businesses can save the expenditure on waste disposal.

Despite such mutual benefit, food-related businesses and the NTCSFN have two closely related concerns: business reputation and food storage. In general, according to the food safety-related regulations, spoiled food cannot be given away or sold. Therefore, currently, when food-related businesses donate produce with unfavorable appearance, provided they have not spoiled. However, food storage during the transportation process and at the communities that receive these foods has been a major concern. If the foods spoil and harm the consumers, this may still damage donor businesses' reputation and brand image, even when the businesses may

not be actually responsible. In Quito, if the donated food harms the consumers, the donors or food banks bear the responsibility for the incident. Therefore, considering the responsibility they have to bear and the logistics costs incurred from the donation, food-related businesses prefer paying a fee to eliminate their organic waste over making donations.

In New Taipei City, Quito, and Medellin, if businesses donate food, they do not have to pay the value-added tax on the donated food, and such donations are exempt from taxation. However, according to Article 28 of the Tax Regime Law of Ecuador, before businesses make donations, they have to write off the goods and report the related information to the taxation authorities through a notary public. In other words, no taxation laws encourage direct donation, and the donation-making procedures are complicated. The delivery cost after the donation is also a factor influencing businesses' willingness to make a donation.

b. Different expectations from the demand side

Medellin and New Taipei City have adopted similar methods regarding sorted food provision to community service sites. However, in New Taipei City, different sites have dissimilar expectations regarding the quality of the donated food. Therefore, some service sites may frequently express their dissatisfaction with the food or even withdraw from the NTCSFN. In fact, when promoting the NTCSFN, the government explained to the communities willing to participate in the program that the provided foods may be partially damaged or may have to be sorted before use. However, the volunteers and congregate meal participants in different communities have different levels of acceptance for the quality of the donated food. For instance, for a box of vegetables with 40% usability, some sites may accept it considering that it contains at least 40% of edible vegetables, whereas other sites may regard the proportion of the inedible vegetables as too high, requiring excessive volunteer effort and subsequent waste disposal, and thus withdraw from the NTCSFN.

Compared with people living in New Taipei City, the disadvantaged people in Quito and Medellin have more difficulties acquiring food.

In Medellin, the received produce is usually processed before redistribution. Therefore, people who receive the produce will not complain so much about the appearance of the food ingredients.

c. Limitations of relevant regulations

The businesses on the supply side of the NTCSFN are mainly those that provide fresh ingredients. However, the amount of food discarded by supermarkets and convenience stores in Taiwan is also considerably large. According to the statistics of the Environmental Protection Administration, >500 tons of food waste is produced every month by supermarkets and hypermarkets, and the food discarded by convenience stores annually equals to a market value

of NT\$7 billion on average. Although most of the discarded food would not immediately spoil and remains edible after the expiration date, the current food safety regulation stipulates that the expired food cannot be neither donated nor resold. Therefore, the inability to reuse such food further increases food waste.

Colombia is the first country in Latin America to formulate public policy preventing food wastage in accordance with the law. The policy prohibits the elimination of food that cannot be sold as products but is still fit for human consumption, and it also encourages food donation to NPOs (e.g., food banks) to help disadvantaged people. However, Medellin still faces the same problem with New Taipei City and Quito, that is, there are no regulations enforced to impose obligations on companies to reduce food wastage and provide incentives for the companies to participate in food wastage reduction. In Quito and Medellin, there is considerable difficulty to cooperate with private sectors due to the lack of regulations while private sectors in New Taipei City make the donations out of their own will. Although large-scale companies can save taxes through donations, most people are accustomed making purchases at small shops or vendors, which cannot make food donation owing to their limited human resources and operating costs. In addition, they are not provided any incentives related to making the donations (e.g., tax mitigation). In addition, the donors are legally liable for the food safety incidents caused by the food they donate. Thus, based on the economic considerations, small businesses can do little about food waste reduction.

3.2.2 Cultural value conflicts in the implementation aspect

a. Traditional value

People generally hold a negative impression regarding surplus food and food produce with unfavorable appearance. Households prefer to not purchase food ingredients with unfavorable appearance unless they have economic difficulties or other considerations. Food appearance seems to symbolize the consumer's status. In New Taipei City, some community service sites participating in the NTCSFN care a lot and are sometimes picky about the quality of the donated food. If the food delivered to the communities is spoiled, it may cause dissatisfaction in the community members.

b. Contemporary health concept

With the economic development, food accessibility and affordability have increased, and people have begun to have their own insistence regarding the food provided. In addition, they are being exposed to healthy diet concepts, such as avoiding eating leftovers and reheating cooked food because the reheating process may produce materials harmful to the body. People's curiosity about the taste of various foods and the increase of their spending power also

cause them to become unwilling to take leftovers back home. These factors can lead to continuous food waste.

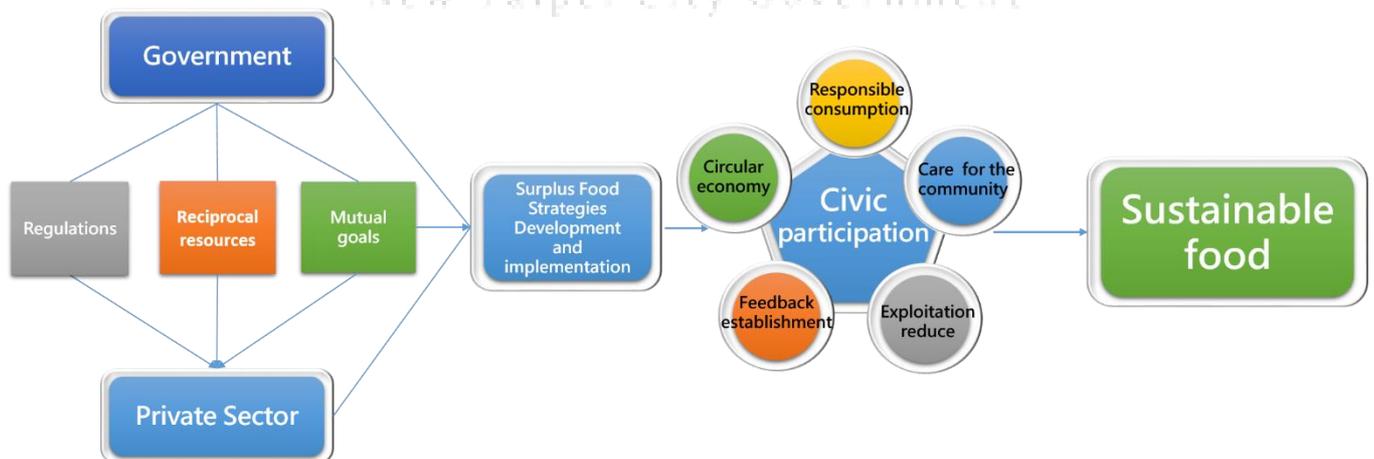
c. Difficulty of changing citizens’ notion

Taiwan was an agrarian society, and the notion of food-saving has been passed down for many generations. However, this has not led to reduction in household food waste. The reason for this situation is that households tend to purchase too much food out of impulse or the worry of insufficiency. Moreover, homemakers have difficulty in estimating the food portion they need to prepare because some family members may eat outside unexpectedly. This can lower their intention to cook at home, and the purchased food may therefore expire and be discarded at last.

Considering the convenience, labor and time cost, discarding food is taken for granted in both households and businesses. Food problems have received substantial attention in recent years, and New Taipei City, Quito, and Medellin have endeavored to reduce food wastage through campaigns and collaboration with private sectors. However, the fixed lifestyle and lack of adequate legislation still lead to difficulty in changing the inherent notions of the citizens.

IV. Future plans and strategies

New Taipei City, Quito City and Medellin City have developed rather diverse surplus food strategies, and each city has its respective development priorities. After this period of experience exchange, we understood the challenges of the three cities in terms of public-private integration and the goals each city hopes to achieve. Therefore, we came up with the following flow charts from the three cities' surplus food programs, and try to initiate “direction in the future and improvement to me made”, “methods for promoting civic participation” and some extended methods through comparison and inspection. Hopefully, better future plans and strategies can be proposed.



Flow Chart of Surplus Food Plan

4.1 Direction in the future and improvement to be made

(1) Responsible consumption

During the 3-day workshop in Quito, we understood the importance of responsible consumption for solving food waste at the back end of the food production line. Quito has been a model city after the Habitat III Conference in 2016; the city has adopted responsible consumption as a critical strategy for food waste reduction. In New Taipei City, although the concept of responsible consumption has not been promoted as a specific policy, it has been included in the various NTCSFN strategies. For instance, for the accreditation of green circle shops, restaurant evaluations—from ingredient purchase to surplus ingredient management—are based on the concept of responsible consumption.

Regarding the change in the citizens' notion, a major reason for household food waste in New Taipei City and Quito is unplanned purchase. Accordingly, the government can promote the idea of “ordering an adequate quantity of food” in the “Leftover Packing-Up Project” to other types of restaurants and food-selling points through advertisements or workshops, encouraging the businesses to help consumers plan their purchase. Furthermore, to achieve planned purchase and reduce post-consumption household food wastage, the government can create a consumption-indicator handbook to suggest the quantity of purchases corresponding to the number of members in a household and contains useful information such as appropriate food storage methods.

(2) Reducing food loss and exploitation-Necessity of food processing

In terms of food processing and preservation, both Quito and Medellin collaborate with food banks to collect food at various stages of the production chain and then extend the expiration date of the food through food processing, thereby increasing the variety of food. In particular, Medellin government has collaborated with the SACIAR Foundation, which develops nutritional supplements by using the surplus food and this enhances the efficiency of alleviating malnutrition among disadvantaged people. However, this approach is uncommon in New Taipei City, where the processing of agricultural produce is strictly regulated by the law. Moreover, in New Taipei City, NPO function and size remain inadequate to conduct food processing compared with those in Quito and Medellin. Hence, in New Taipei City, this model warrants considerable development.

Considering the limitations of regulations and the existing facilities, New Taipei City Government will evaluate the collaboration with food processing plants. The food processing plants can use the existing facilities and professional technologies to process the excessive amount of fruits and vegetables harvested in season and extend their expiration dates. Therefore, the food can be distributed and used more effectively. Regarding the implementation

of the existing programs, it is recommended that the government should cooperate with NPOs that possess a central kitchen. Then, in addition to directly using the food for congregate meals, the food can be made into boxed meals or frozen foods to be provided to older people who live alone or to disadvantaged households in rural areas. This can help the government in effectively distributing surplus food to the public. In Quito, the incomes of urban farmers have been raised by selling products made from surplus produce. In the future, farmers in the same community can share the factory space and adopt a cooperative economy model to improve local income and quality of life.

(3) Developing a platform for the food network

Through the circulation of information on the Internet, consumers do not have to obtain food from the dealers. Instead, the establishment of a dedicated platform enables the production end and the consumer to communicate instantly. Medellín's "Alliance for the good living" will, in the future, build a cloud platform and educate farmers, operators and consumers to use the system to directly select the products to be sold and purchased while avoiding layers of exploitation and food loss during transportation. After the farmers' income has increased, they will have more capital for the seedlings, land and equipment of farming, and reduce their loans and debts.

(4) Enhancing the delivery of welfare services

Improving disadvantaged people's life and nutrition through food collection and utilization is the common goal of food-saving strategies adopted by the three cities. The effective utilization of surplus food can reduce environmental cost and welfare expenditure, eliminate hunger and malnutrition, and reduce the future social costs induced by poverty, disease, and health care. The focuses of the food-saving strategies are to achieve the supply-demand balance and enhance the resource delivery network's coverage and completeness.

The cities should examine the provision of welfare and food resources to disadvantaged groups and connect the financial and material resources with possible food-related programs in communities. The cities should also examine the resources that different communities are lacking and establish a network mechanism for resource dispatch and allocation.

(5) Implementation of circular economy

In addition to the promotion of the concept of food recycling economy, the implementation of schools, communities and families is also a key factor in the promotion of circular economy in the surplus food program.

In the process of promoting the surplus food program, it is still inevitable that there will be some loss or food waste. How to maximize the value of the inedible food is the core concept of the circular economy. In the past, the business waste of New Taipei City will be processed into feed,

fertilizer or be buried and incinerated by specific units. However, now there are schools in cooperation with the Environmental Protection Agency to set up kitchen waste machines. With it, kitchen waste in the school can be fermented into fertilizer and used in the vegetable gardens in the school. In Quito there is no separation of garbage for the collection and neither a management of organic waste. However, a good practice that can be mentioned is that of the Urban Agriculture project of Quito, which encourages the use of organic waste for compost production, humus and other organic fertilizers for the maintenance of soil fertility.



Kitchen Waste Machines at School



Compost to Be Used in Community Garden

4.2 Methods for promoting civic participation- Putting food-saving into practice

(1) The power of education

New Taipei City, Quito, and Medellin all have their distinctive food-saving strategies and all consider education the most crucial factor that facilitates strategy implementation. Currently, in New Taipei City, the value of food-saving is being promoted among the public through various activities and conveyed to schoolchildren through the “Empty Plate Movement.” In Quito, Guagua Centros provide food for disadvantaged children aged <5 years and provide food and agriculture education in the centers’ vegetable gardens to strengthen children’s understanding of food. In addition, more awareness is achieved for the separation and use of organic waste through urban agriculture and its wide range of action in the city, highlighting the intervention in schools and children as actors of change. Medellin promotes urban and suburban orchards, implements food and nutrition education, and increases civic participation under the food and nutrition security policy.

To eliminate food waste that has existed for a long time, food-saving education should be provided not only in schools but also through various forms of education, such as occupational training and lectures or courses for households and businesses. Food education is consequently expected to subtly and gradually change people’s habits and thus reduce food waste.

(2) Initiatives to relevant regulations

The regulations can be divided into legal ones and non-statutory ones. The legal part refers to the central government or local government clearly regulates the industry and related operators, including benefits or exemptions, in order to reduce food waste or promote other surplus food programs. At present, there are no relevant laws and regulations in the three cities in terms of requiring the operators to cooperate with the promotion of surplus food programs, and this makes the public-private cooperation more difficult in Quito and Medellin. With the help of initiatives or the making of local self-governance regulations, surplus food programs can be executed more effectively.

In the non-statutory part, the business-related government departments can incorporate the relevant factors of the surplus food programs into the indicators of business application, assessment and counseling, so that the industry can assist with the surplus food program promotion while passing the evaluation. The Green Circle store evaluation in New Taipei City adopted this model. The city of Quito also has a preliminary restaurant evaluation, which is expected to incorporate the elements of surplus food programs.

(3) Reciprocal public-private partnership

The regulative mode of cooperation previously mentioned is more coercive while the model of resource reciprocity is to arouse civil units' willingness to cooperate by the influence and resources of the public sector.

All government departments have business dealings with different units in matters like qualification review, the use of public land, or even procurement contracts, marketing, promotion, etc. Although the government departments are not profit organizations, but they have mastered a considerable amount of resources and consumption power such as small-scale purchases according to their own needs or the price control of the lease on facility space. If these existing cooperation could comply with surplus food strategies as a conditional condition, then it is more possible for the industry to devote in the consideration of certain interests. As for the operation model, it should be tailored to the local version with existing resources and actual conditions.

(4) Emphasizing food problems in corporate social responsibility

The food-saving strategies adopted in all three cities are related to businesses. However, legislation requiring the businesses to participate in food-saving actions to reduce food waste is lacking. The collaboration between New Taipei City Government and businesses is based on the traditional concept of following a virtuous path. Therefore, businesses are willing to donate money or material resources. By contrast, donations are not prevalent in Quito; therefore, some food-saving policies are difficult to implement there. Colombia signed No. 71 Municipal Agreement in 2009, which specifies strategies for enhancing food bank operations and provides various

incentives, such as tax exemption or tax refund, to people who make donations. In addition, Colombia is the first Latin American country to enacting legislation to prevent food waste. Thus, Medellin faces less obstacles when encouraging businesses to donate food to food banks.

With the increasing adoption of corporate social responsibility in recent years, businesses have begun exploring channels for social participation. Therefore, the local government can first understand businesses' resources and expectations and then develop a collaboration model that satisfies both parties. Even though the businesses may not directly donate food, they may have higher intention to participate in relevant events or projects. The Guagua Centros in Quito rely on the funds provided by the government to hire staff, purchase food, and conduct administrative work. If the centers can cooperate with farms and food-related companies, the amount of surplus produce in the places of production as well as their expenditure on food can be reduced.

4.3 Extended methods

(1) Integration and promotion of indigenous culture and food and agricultural education

Among New Taipei City's population of 4 million, more than 50,000 indigenous people are living in the city and its mountainous area. New Taipei City Government established culture and health stations for these people aged >55 years; these stations serve as the daycare sites for older indigenous adults and provide health promotion and caring services as well as cultural courses to arouse the indigenous people's cultural memory and identification.

In 2018, the NTCSFN began cooperating with the culture and health stations in Shulin and Wulai Districts and operating the surplus food sharing kitchens. In addition to using surplus food, schoolteachers and schoolchildren, who serve as volunteer cooks, can learn about indigenous people's diet culture and understand the cultural difference between the indigenous and Han people. This can be an optimal channel for nonindigenous children to understand the culture in Taiwan.

Quito is a cross-cultural city, comprising, mestizo population, indigenous people and Afro-Ecuadorian people. The municipal policies cover children, young people, and women and consider the city's ethnic and cultural diversity. Quito encompasses 33 rural parishes, where the populations are mainly indigenous people and their descendants. These parishes convene meetings focusing on art and culture (i.e., dance, music, and drama) annually, increasing the value of their cultural heritage and traditions (traditional songs sung during wheat planting and traditional methods for food preparation and preservation, etc.) by presenting the historical events.

Implementation strategies: New Taipei City Government thinks that the food and agriculture education based on indigenous culture is a possible direction for future implementation of NTCSFN. In contemporary Taiwan, many indigenous people have left their tribes, settled in cities,

and assimilated into the Han people's society for generations; the urban indigenous people have thus forgotten their mother tongues and traditional cultures. To remedy this, the culture and health stations and schools collaborate with each other; specifically, the culture and health stations collect the information regarding indigenous people's diet, culture, and history and provide the information to schools to help schoolchildren understand the indigenous culture. Moreover, the culture and health stations hold food education activities or courses from time to time, inviting indigenous older adults to teach urban indigenous children their traditional culture through traditional meals such that their culture can be passed to the next generation.

(2) Influence of social enterprise and relevant business models

Influenced by the global food problem, many entrepreneurs have incorporated surplus food usage into the design of their new businesses. For example, many restaurants in New Taipei City and Taipei City use organic vegetables and fruits with unfavorable appearance as ingredients of their meals or food products. For reducing food waste, an increasing number of restaurants in other counties or cities are purchasing surplus food ingredients in the market and making them into various dishes to be sold at a price decided by consumers.

From the perspective that surplus food is an abundant resource, the aforementioned model is feasible and has been increasingly implemented in Asia, Europe, and the Americas. However, the governments' support for these entrepreneurs (surplus food education during vocational training, menu design matched with surplus ingredients, and so on) should be increased so that their operating obstacles can be reduced. This strategy can enable entrepreneurs to not only operate the concept of food-saving systematically but also connect directly to farmers at the place of production, thus reducing the costs, but increasing the profits, of both parties.

V. Conclusion

Based on the comparison of the experience among New Taipei City, Quito, and Medellin, the core and supplementary elements that should be constructed for the implementation of the Surplus Food Pilot Project are as follows:

1. Core elements

The first core element is a **working organization with decision-making and execution abilities**. The execution methods and goals of different departments can be clarified after planning and division of the accountabilities and responsibilities. Work meetings should also be convened regularly to set goals and modify the inadequate parts involved in program implementation and thus optimize the program. The second element is **storage equipment and transportation network**. Quito and Medellin are cities located in valleys, where the terrain considerably influences the transportation. Food storage during long-distance transportation is also a key factor influencing food loss. Thus, constructing a complete transportation

network is indispensable regardless whether the food-saving program is implemented by the public or private sector. The final core element is **processing method**. The transportation network, in the middle, aims to reduce food loss, whereas the processing, in the back end, aims to reduce food waste. In particular, food is provided to community canteens or service sites for congregate meals or is processed into jams, juices, or nutritional supplements. With more diverse processing channels, more surplus food can be used effectively.

2. Supplementary elements

Local legislation support and incentive design are the two supplementary elements. When implementing food-saving strategies, all the three cities often faced difficulties because of the limitations posed by food safety regulations or the lack of relevant regulations to support the strategies. Some European countries have formulated relevant regulations to ensure the sound implementation of strategies. However, in New Taipei City, Quito, and Medellin, the regulations cannot be amended in the short term. In such situations, the incentives should be enhanced to boost the participation of the private sector and the general public. When expected advantages outweigh the disadvantages, changes can occur eventually.

In addition, each partner city has its own advantage in the surplus food program. New Taipei City has a relatively close cooperation and execution between the government departments, so the program can be more easily and quickly promoted on its own or in combination with the private sector. However, in terms of assessment of the big data and quantitative status about current situations, the cities of Quito and Medellin have a more intensive and systematic assessment of needs in cooperation with UN and global networks related to food. If other cities could have both of the advantages while implementing surplus food programs, the local food waste should be improved more effectively, and surplus food could be redistributed to neighboring cities in need.

Through the exchange and comparison of the surplus food programs, all three cities gained precious insights from each other. Food problems exist in all cities, so the concept of food-saving is something everyone should pay attention to no matter how well the economic development of a city is. Only when every city is willing to take actions to promote food-saving can the problems of hunger, food waste, and unequal resource distribution can be eliminated gradually.