

Enhance Exceed Food Usage by Android Application Platform based on Local Community

Hsiang-Leng, WANG
National Tsing Hua University, Taiwan

Abstract. According to Taiwan People’s Food Bank Association, it estimates that 2.75 million tons of food goes to waste in Taiwan annually, and in average, each person produce 96-kilogram leftover every year. Certainly, some of that could benefit the 350,000 people who experience hunger. From producers, wholesalers, packagers, shippers, vendors, restaurant owners to consumers, we make tons of invisible wastes through these processes. Therefore, we built an android application platform to solve this problem. Through this application, we can gather food from local markets, supermarkets and restaurants more easily. These vendors and residents can post what they want to donate to the community today on this platform, and see what kind of dishes they would like to cook and share. This app is absolutely a helpful platform for everyone from collecting exceed food to sharing dishes with our community, and furthermore, we can connect the relationship between our neighbors to build a friendly living environment. Our extreme goal is to optimize the usage of exceed food and make our life better.

Keywords. Leftover Food Treatment, Food Waste, Community Development, Sustainable Development

Introduction

Food waste is getting a lot of attention lately, and for good reason. No matter how you slice it, the statistics are downright alarming. In a way, it’s a testament to the incredible progress we’ve achieved as a species by producing an overabundance of food to ensure survival. And while we continue to make progress through technology to increase efficiencies in our food system, we’re moving in an unsustainable direction, with more and more food being produced while nearly a billion people still don’t have enough to eat. Consequently, we find that the most serious problem is an unbalance between supplies and demands in all around the world.

To resolve this problem, we should focus on sustainable development. However, the first step is always difficult, and what can we do to decrease food waste? According to the analysis of Bagherzadeh, M., M. Inamura and H. Jeong (2014), which addresses some details about multiple use of these exceed food. In the graphic of Food Use Hierarchy (Figure 1), researchers clarified six levels of food usage, including food, source waste reduction and prevention, food recovery, animal feed, industrial uses and disposal which is the worst way. To achieve our goal, we can emphasize on the food recovery process as our first step.

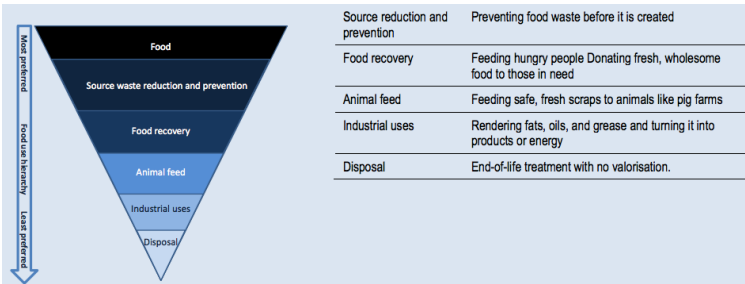


Figure 1. Food Use Hierarchy

1. Literature Review

1.1 Food Waste

With the climate change, improper utilization of soil, frequent natural disasters and the pollution caused by man-made have become more and more serious, which impacted the agricultural production in various places and seriously affected the operation of food in the supply chain. United Nations Population Fund (UNFPA) pointed out that by 2050, the world's population will surge to 9 billion. The large population will not only increase the load on crop production, but also aggravate the crisis between the number of hungry people and the unequal distribution of food. In addition, as much as one-third of the world's food is wasted and lost by consumers without food. These wastages cause huge economic losses and greenhouse gas emissions each year. Combining some situations which is mentioned above, such as serious food waste, insufficient food production and uneven food distribution have already become the national food security issue. Among those issue, “food waste” has become one of the pressing issues around the world and the United Nations has even considered the issue of food waste as one of the major threats to food security.

The problem of food waste is a global issue, but the extent and factors of waste differ from region to region. In low-income countries, food waste comes mostly from technical and transport constraints, whereas in middle-income and high-income countries, unnecessary food waste is often caused by consumers’ buying, discarding practices and retailers’ casual abandonment of food due to appearance. In addition, according to the literature, the waste caused by the two stages of distribution and consumption has the highest contribution to the carbon footprint in the entire food supply chain covering production, harvest storage, processing and packaging, transportation, market allocation and consumption stages. The phases cover the entire market system (including restaurants, supermarkets, stores and discount stores) and household consumption (including consumption by households and individuals). According to the literature, as many as 70% of the surplus food is processed by Taiwan's discount stores, stores and supermarkets for incineration and animal fodder, and the methods used for leftover food handling are not sufficiently diversified and discarded the purpose of this study is to evaluate the quantity of fruits and vegetables waste in Taiwan in two stages and the index establishment and strategic planning of the subsequent methods of reprocessing leftovers.

From the results of the situational analysis, we can see that the proportion of processing strategies that leftover food is processed in full and the overall economic efficiency is maximized is “leftover food restaurant”, followed by “food bank” and finally “leftover power generation”.

1.2 Food Recovery

The term food “recovery” refers to the collection, or recovery, of wholesome food from farmers’ fields, retail stores, or foodservice establishments for distribution to the poor and hungry. Food recovery programs operate across the United States and target many different levels of the food marketing system. A few are large operations with offices in many States, but most are small local programs that depend largely on the efforts of volunteers from the surrounding community. A Citizen’s Guide to Food Recovery, recently published by USDA, classifies these efforts into four major types:

- Field gleaning—the collection of crops from farmers’ fields that have already been mechanically harvested or on fields where it is not economically profitable to harvest
- Perishable food rescue or salvage—the collection of perishable produce from wholesale and retail sources such as supermarkets;

- Food rescue—the collection of prepared foods from the foodservice industry, including restaurants, hotels, and caterers
- Nonperishable food collection—the collection of processed foods with longer shelf lives.

Once surplus food has been “recovered” or prevented from going to waste, volunteers pick up and deliver the food to groups that serve the needy, either directly through neighborhood charitable organizations, such as food pantries and soup kitchens, or indirectly through food banks. In addition to providing additional quantities of food to hungry people, food recovery efforts can also provide food banks with the ability to offer clients more variety and nutrients in their diets by adding fiber-rich fresh fruits and vegetables and grain products to the typical offerings of nonperishable canned and boxed goods. Food recovery also has benefits that extend beyond providing food to the needy. For example, the additional food supplied by recovery programs allows agencies that serve the disadvantaged to reallocate money to other needed services, money that they would have otherwise spent on food.

2. Method

2.1 Intermediate Platform

Recovery of safe and nutritious food for human consumption is to receive, with or without payment, food (processed, semi-processed or raw) which would otherwise be discarded or wasted from the agricultural, livestock, forestry and fisheries supply chains of the food system. Redistribution of safe and nutritious food for human consumption is to store or process and then distribute the received food pursuant to appropriate safety, quality and regulatory frameworks directly or through intermediaries, and with or without payment, to those having access to it for food intake. (FAO, 2015)

2.2 Community Development

Community collaboration is fundamental to developing and sustaining successful farm-to-food bank (F2FB) initiatives. Through individual consultations, regional workshops, and conference calls, Growing Connections seeks to facilitate the development of community relationships that increase the amount of fresh, nutritious food to clients and bolster the hunger relief system across the state.

- Individual Consultations: Communities and hunger relief agencies across Washington are highly diverse, with many different program realities. Through individual consultations, we seek to meet programs where they are and share targeted strategies and resources for achieving their F2FB goals given their particular situation. Use our Action Plan Worksheet and Consultation Guide to begin visioning and planning a fresh food program.
- Workshops: The purpose of our workshops is fundamentally to facilitate food banks, growers, and community members connection and strengthen or create Farm-to-Food Bank initiatives. A pilot series of workshops were held in several regions across the state of Washington. We created a space for food banks and interested community organizations to brainstorm F2FB initiatives and strategies, create action plans, and develop partnerships.
- Conference Calls: Monthly conference calls have been held for each of the regions where we held workshops. Each month, food banks and community members have conversations, share updates, and develop partnerships around Farm-to-Food Banking.¹

3. Case Study

3.1 InStock: Tackling Food Waste

Sustainable development is fundamentally about efficient management of resources. When it comes to food, the Netherlands wastes about a third of this important resource at different stages of production, processing, retailing and consumption. Among the most important players in tackling food waste are supermarkets and businesses. A combination of superficial and draconian regulations governing this sector means that a lot of edible food is wasted when vegetables are not perfect looking or when food approaches expiration dates. InStock is a clever initiative that addresses these food waste challenges in an innovative and entrepreneurial way. Four young people who were previously working for Albert Heijn (the country's largest supermarket chain) and its mother company Ahold, came up with the idea of opening a restaurant serving the food that would otherwise be discarded. Their proposal won the "Best Idea of Young Ahold", an internal company competition, and InStock was created as a pop-up restaurant. After a successful trial period, InStock now has a permanent home in Amsterdam Oost, along with a kiosk toko on Ferdinand Bolstraat and a food truck you can spot at festivals. On a daily basis, fruits, vegetables and bread are picked up from Albert Heijn stores using an electric minivan, making transport of the food as sustainable. A few other suppliers provide meat, fish, chocolate and beer that would otherwise be discarded. Then the chefs are tasked with creating delicious meals based on this "daily harvest", which they accomplish every time.

4. Conclusions

According to the food waste analytic data in Taiwan, it seems that though people have a lot of resources, they don't treasure what they own. However, we didn't think about that these residents perhaps would like to donate their food but there is no obvious way to access. Even for the existence of food bank organization, it is not easy to donate something valuable immediately. Consequently, building a smart phone application to connect this "communication gap" is a good solution. In addition to collecting exceed food, residents can make good use of these resources to cook dinner and eat together. It is not only improving the efficiency of the food collecting, people who live in the same area can keep in touch all the time. In this project, developing a completed system to connect each home is our first goal, and educating residents correct concepts of food usage is our main purpose. Finally, everyone knows how to purchase food without waste and make good use of it. Meanwhile, the food waste problem will be solved, and the entire world and environment will last long sustainability.

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¹ Northwest Harvest Organization – Community Development