





Norwegian University  
of Life Sciences

# REDUCING FOOD WASTE THROUGH DIRECT SURPLUS FOOD REDISTRIBUTION: THE NORWEGIAN CASE

MASTER THESIS

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**ABSTRACT:**

Food waste is a global problem with significant economic and environmental consequences. Food waste management approaches include production of biogas, animal feed and compost and surplus food redistribution. From a sustainability point of view, surplus food redistribution is the most favorable approach. Surplus food redistribution can be either direct (between suppliers of surplus food and charity food services) or indirect (Through Food banks). This paper is a case study on direct surplus food redistribution in ten cities in Norway. The study explores the logistics, embedded social relationships and volume of surplus food redistributed through charity food services. The results show that the logistics of direct redistribution in the cities included in this study are complex, efficient and formal. Direct surplus food redistribution in Norway is heavily dependent on the workforce of volunteers and personal relationships among the participating actors. Every day 3500 meals are made with ingredients from direct redistribution in the ten cities included in the study. In conclusion, the study suggest that current surplus food redistribution in the cities included in this study make a significant contribution to food waste reduction and surplus food redistribution should be considered as a strategy to reduce food waste.



## Table of Contents

1. INTRODUCTION .....	6
2. METHODS.....	9
3. RESULTS.....	11
3.1. LOGISTICS .....	11
3.2. SOCIAL ASPECTS.....	18
3.3. FOOD RECOVERY .....	20
4. DISCUSSION.....	21
5. CONCLUSION.....	25
6. REFERENCES .....	25
7. APPENDIXES .....	31



## 1. INTRODUCTION

There is a great paradox in the current global food system: While in the poorest nations, 805 million people do not have enough food to lead a healthy active life (FAO, 2014), in the richest nations one third of all food produced is thrown away (Gustavsson, 2011).

Food is lost or wasted along the whole value chain. In developing countries, 40% of the food waste occurs during post-harvest processes, while in developed countries 40% of the food waste occurs at retail and consumer level (Gustavsson, 2011).

Food waste has serious environmental impacts. Producing food that will not be eaten represents a waste of land, water and energy resources (Gustavsson, 2011). Food that is produced and then wasted, uses 173 billion cubic meters of water, 198 million hectares of arable land and 28 million tons of fertilizer a year. Producing, processing, distributing and commercializing food that is eventually wasted accounts, for 3.3 G tones of CO<sub>2</sub> (FAO, 2013). In addition, the disposal of food waste in landfills also produces methane and carbon dioxide as part of its natural decomposition process, contributing to 3% of global GHG emissions (Papargyropoulou, et al., 2014)

From an economic perspective, food waste reduces farmers' incomes (Lipinski, 2013). Farmers, who already lose a significant part of their produce to disease, pest or weather, are forced to leave their produce unharvested if the market prices are too low and do not cover labor costs. Other times farmers produce more crops than there is a demand for or their produce does not meet the quality or appearance criteria of buyers. A lot of this unharvested produce is left on the ground and plowed under, mitigating some of the loss by transforming the unharvested produce in nutrients that return to the soil. Nevertheless, doing that is losing the opportunity to use food for its original purpose of human consumption. (Gunders, 2012). In Sub-Saharan Africa food losses at the farmer's level account for US\$4 billion per year (Lipinski, 2013), while in India this figure rises to more than US\$10 billion (Segrè, 2014).

Distributors, processors and retailers also lose money when they are forced to discard food because of damages. Food damages because of improper storage or packaging. Food is also discarded for not meeting the quality or appearance criteria of buyers (Gunders, 2012). In total, it is estimated that food waste accounts for US\$240 billion on the agricultural level, US\$340 billion from harvest to sale and US\$170 billion at the consumption stage (Wrap, 2015)



Formal food waste management approaches include the production of biogas (anaerobic digestion), animal feed or compost. A more informal approach is rescuing surplus food before it becomes food waste. Reynolds et al. defines food rescue as *“the practice of safely diverting edible food that would otherwise go into waste disposal systems, and distributing it to those in need, the food insecure”* (Reynolds et al., 2015). In practice this means that food that is still edible but that producers, distributors and retailers are not able to sell for different reasons, is donated to organizations that use it in charity food services (Lipinski, 2013). This includes unharvested crops, foods with damaged packaging, food that does not meet specific esthetic standards and food that is not sold before its “best before” date. (Lipinski, 2013).

Several authors, such as Papargyropoulou et al (2014) or Stuart (Global Feedback Ltd, 2015), have explored and compared the different options of food waste management and agreed that when considering all environmental, economic, and social dimensions of sustainability, food rescue is the most favorable method to manage food waste once all efforts to avoid its generation have been exhausted.

There are two approaches to redistribute rescued food. The first approach is the redistribution through food banks. Food banks are organizations that receive surplus food from different suppliers, store it and distribute it among charity organizations, for its further distribution to people in need, through soup kitchens or shelters (Schneider, 2012). The second approach is through soup kitchens or shelters directly. These organizations receive the food directly from the supplier, without the intermediation of food banks, and offer food services such as prepared meals or bags of groceries (Rosenblum, et. Al., 2005). In this paper, the first approach (redistribution through food banks) will be referred to as “Indirect redistribution” and the second approach (redistribution through direct and locally organized agreements between the suppliers and charities) as “direct redistribution”. Figure 1 illustrates the two approaches.

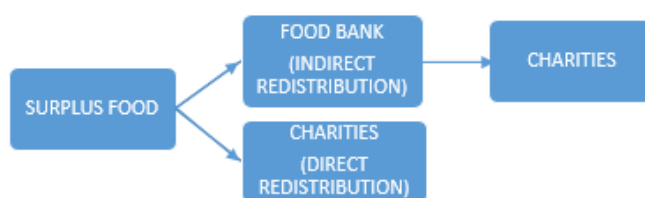


Figure 1: Direct surplus food redistribution in Norway. Surplus food redistribution approaches

Although several authors have studied indirect redistribution, there is little available research carried out on direct surplus food redistribution. Some studies on food recovery include one or two examples on direct

redistribution, such as Midgley (2013) or Reynolds (2015), but there are not previous studies that describe the logistics and impacts of direct surplus food redistribution.

In Norway, the only data available on direct redistribution is from a report on surplus food redistribution in the Nordic region, by The Nordic Council. The study explored direct redistribution in the three Norwegian cities, highlighting the potential of this approach as a strategy to reduce food waste and the need for further and more in-depth studies on the topic (Hanssen, et al., 2015).

While there is a lack of research evaluating direct redistribution, there are many studies that focus on indirect redistribution. In general, studies agree that surplus food redistribution is a valid and efficient approach to food waste reduction. Studies on indirect redistribution include research on logistics (Schneider, 2013; Tarasuk & Eakin, 2003; Tarasuk & Eakin, 2005), efficiency (Phillips, 2013), food flow (Alexander & Smaje, 2008) and surplus food redistribution through food banks as a waste management strategy (Reynolds, 2015). There are also studies on the social impacts of charity food services such as soup kitchens or shelters. This literature explores aspects such as the motivations of volunteers (Agostinho & Paco, 2012), structural problems of the charity organizations (Lorenz, 2012) and institutional aspects of surplus food redistribution through food banks (Curtis, 1997 & Riches, 2002). There are also many studies exploring the characteristics of charity food service users (Lindberg et al., 2015; Wicks, 2006; Godoy et al., 2014; Magura, et al., 2000).

Although the studies on indirect redistribution describe aspects relevant to direct redistribution also, the two approaches have different logistical implications such as for example, routines or participating actors. Therefore, the objective of this study is to discuss the main aspects of direct redistribution in Norway in order to contribute to the understanding of this approach to food waste reduction. On this study, I aim to answer the following research questions:

*How do charities participating in direct redistribution in Norway access, manage and use surplus food in their charity food services?*

*What are the characteristics of the social relationships embedded in direct surplus food redistribution?*

*How much food is redistributed through charity food services in the ten Norwegian cities included in this study?*

## 2. METHODS



Figure 2: Direct surplus food redistribution in Norway. Norwegian cities and regions included in this study

This study explores the experiences of charities participating in direct redistribution in ten of the biggest cities of Norway: Bergen, Trondheim, Stavanger, Drammen, Fredrikstad, Kristiansand, Tromsø, Skien, Sandefjord and Moss. The cities of Sandnes and Porsgrunn were also included in the study for being small towns with close relationship to Stavanger and Skien respectively, although their results were merged with their corresponding main city.

Two organizations located in the city of Råde were also included. However, the results of one of these were merged with the results from the city of Fredrikstad,

and the results of the other were included with the results from the city of Moss, due to the proximity of the charities and these main cities. Although there is surplus food redistribution in the Norwegian Capital, Oslo was not included in this study as most of the organizations based there supply their meals from the city's official food bank.

The ten cities chosen represent the five geographical regions of Norway (Nord-Norge, Trøndelag, Vestlandet, Østlandet and Sørlandet).

In each city, a minimum of four organizations were contacted, with the exception of Stavanger, Moss and Trondheim where only three organizations using surplus food were identified. In average, five charities using surplus food for their activities were found in each of the cities visited. In total, this study includes 53 organizations that participate in local and direct surplus food redistribution in the ten cities mentioned before.

In order to explore direct redistribution in ten of the biggest cities in Norway, I adopted a case study approach, an empirical research method that allows investigating the situation in depth and within its real-life context, through reflecting on the why's and how's of the phenomena being studied (Yin, 2013).

In addition, I applied other research methods such as semi- structured interviews and participatory observation.

The every day operations of the soup kitchens or shelters included in this study were explored through semi-structured interviews with people in charge of or fully involved with the charity food services. The interviews took place between October and December 2015 and lasted between 15-45 minutes. The questions explored the logistics of picking up, classifying, storing and serving the food, challenges and opportunities, and are included in Appendix 7.1 of this study.

In most cases, the semi-structured interviews were complemented by participant observation. Data was collected from informal chats and observations while the interviewee received, organized, prepared or served the surplus food around the kitchen, storage or dining facilities. This also allowed me the interaction with other people participating in the food services, including other volunteers or users of the charity food services. Unfortunately, this was not possible in all cases, with some charities preferring to protect the privacy of the volunteers and/or those using the charity food services. In the case of charities not visited because of schedule or geographical limitations, phone and e-mail interviews took place instead.

In order to address the second question of this master thesis (*What are the characteristics of the social relationships embedded in direct surplus food redistribution?*), questions about the social aspects of this approach to food waste reduction were included in the interviews as well. These questions explored the relationships of volunteers with both suppliers and users of the charity food services. The questions also addressed the characteristics of the food services offered at the charities and the characteristics of the users of those services. Once again, participant observation complemented the data from the interviews and it took place while waiting before an interview or by joining a food service for a meal.

Data from the interviews was organized in three themes: logistics, social aspects and food recovery. Then, the data was entered into a chart that listed donors, facilities, services and other details for each charity.

In order to have an idea of how much food is redistributed through charities in the ten cities studied, data from the charities' official publications were used. The numbers were also discussed during the interviews. Due to the differences in the type of food services offered at the charities (Some of the services offer prepared meals and some others offer bags of groceries), all food was translated into "meals" figures. In the case of services that offered food

bags, the charities reported that each person receiving food bags received enough food for 3-4 meals for 2-4 people, Hence for this paper I have calculated that each person receiving bags of groceries represented a minimum of eight meals.

### 3. RESULTS

#### 3.1. LOGISTICS

There are many actors participating in direct redistribution in the Norwegian cities included in this study. On one side, are the producers, distributors and retailers that supply the surplus food, on the other side, are the charities, which are the ones receiving and using the surplus food in their various services.

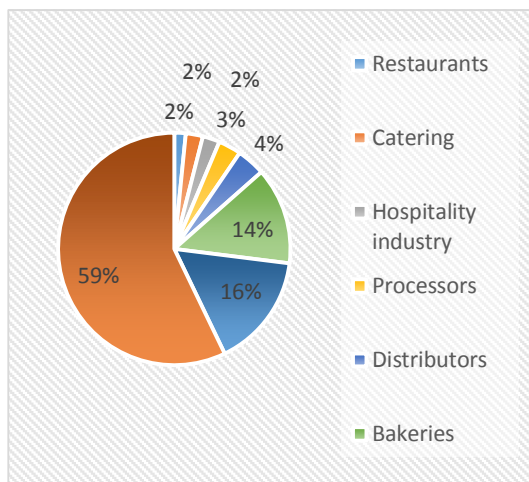


Figure 3: Direct redistribution in Norway. Suppliers of surplus food by type of supplier.

On the supplier side, as Figure 3 illustrates, supermarkets, producers and local bakeries are among the suppliers contributing with the most surplus food to the charities. Some distributors and food processing companies also donate surplus food. However, very few restaurants, hotels and catering companies are currently donating their surplus food to local charities. No farmers were reported as donors by any of the charity representatives interviewed for this study.

The two supermarkets that have the greatest involvement in direct surplus food redistribution are KIWI and REMA1000. Both supermarket chains have official agreements with the charity organizations The Church City mission and The Salvation army, which are the charities most active in direct redistribution across the country. The supermarket chains COOP, RIMI and MENY also donate their surplus food to charities in several of the cities included in this study, although not to the extent of REMA1000 or KIWI. The producers with the greatest activity within direct redistribution are FRIELE (coffee), TINE (dairy) and MILLS (spreads and processed foods). Bakeries are also important donors of surplus food. Many kilos of bread and pastries are donated to local charities at the end of the day across the country. The food processors and distributors participating in direct redistribution are ASKO (groceries) and BAMA (fruits and vegetables), and the two meat

processing companies NORTURA and GILDE. Surplus food donations from catering, hotels and restaurants are very sporadic and include food with very close expiration dates, so in general these donations are not that significant. Table 1 illustrates the most important suppliers participating in direct redistribution in Norway and on Appendix 7.2 a full list of suppliers by percentage of participation is illustrated.

Table 1: Direct redistribution in Norway. Suppliers of surplus food by type of supplier

DISTRIBUTOR	PRODUCER	SUPERMARKET	RESTAURANT	PROCESSOR	CATERING
ASKO	RINGNES	MENY	DOLLY DIMPLE'S	NORTURA	ADAM'S MATKASSE
BAMA	MØLLER	BUNPRIS	STARBUCKS	GILDE	
	TORO	MAXI			
	STABBURET	JOKER			
	FRIELE	SPAR			
	TINE	EUROPRIS			
	MILLS	ICA			
		MENY			
		RIMI			
		COOP			
		REMA			
		KIWI			

As for those receiving and using the surplus food, there are several organizations and groups involved. In general, these organizations and groups are initiatives offering different kinds of support services to people struggling with substance abuse, psychological problems, crime, unemployment, poverty and similar. These organizations and groups include religious, political and independent organizations and different social programs, sometimes run by the local municipalities such as the case of Cafe 103 in Tromsø or the Social medicinal center in Sandefjord. Table 2 illustrates the most important charities participating in direct redistribution in Norway, organized by type of organization.

Table 2: Direct redistribution in Norway. Charities receiving surplus food by type of organization

RELIGIOUS ORGANIZATIONS	POLITICAL ORGANIZATIONS	INDEPENDENT ORGANIZATIONS	SOCIAL PROGRAMS AND OTHERS
Church city mission	AEF soup kitchen	Open house	Blue cross children station
Philadelphia church	The people's café		Church city mission job training
The Free church	Food fest against famine		Crux follow-up center
The salvation army			Virkelig street magazine
Vintreet congregation			Fountain House
The Blue cross			Robin Hood house
Church City mission			Sammen om nøden (SoN)
Diaconal center			Social medicinal center
Northern church			Social Cafe
Sion Pentecostal church			Café Britannia
			Café Magdalena
			Cafe 103
			Cafe x
			The Red Cross

The most active organizations in direct redistribution across the ten cities included in this study are The Church City mission and The Salvation Army. These organizations have formal agreements with different supermarket chains, which allows them to access surplus food on a regular basis. Other organizations that are very active in direct redistribution in the ten cities included in this study are The Blue Cross and Sammen om Nøden (SoN). Together, these four organizations represent 65% of all charities using surplus food in their food services in the cities included in this study.

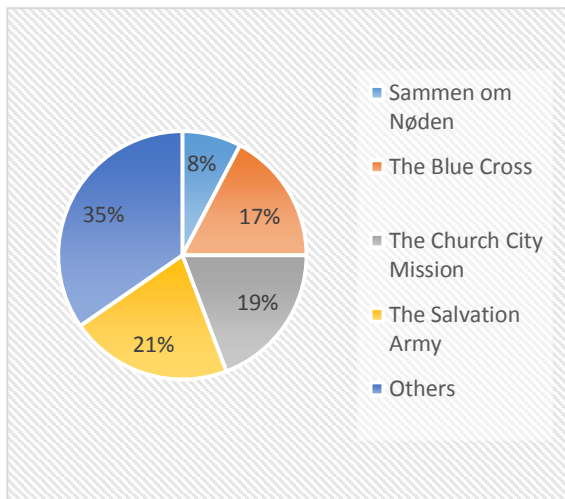


Figure 4: Direct redistribution in Norway. Organizations receiving surplus food from suppliers

Other charities receiving and using surplus food are The Vintreet congregation, The Sion congregation, The Red Cross, The Northern Church, The Philadelphia Church, The Robin Hood House, The Fountain House, etc. Although many of the charities involved in this system are religious organizations, their religious activities are separated from their food services in most cases.

There are also political groups such as “The People’s Kitchen” or “Food Feast against Famine”, which organize events where they serve a free meal prepared with surplus food donated from suppliers, in order to raise awareness about the problem of food waste. Both volunteers and those eating the food are usually very committed to the cause of food waste reduction and distribute/eat surplus food as a way to make a statement to the society.

In addition to these actors, there are two individuals contributing to the logistics of direct redistribution on a volunteer basis. They pick up, sometimes store and deliver surplus food to different charities, groups and individuals, acting as “middle men”, similar to the role of a food bank. The first person is located in Trondheim. His name is Bjørn Eklo and he started with this activity 20 years ago, although much more intensively in the last 10 years. He picks up food from supermarkets, producers and distributors, stores it and delivers it to several organizations or groups. He has a direct and close relationship with the different actors supplying and receiving the surplus food in Trondheim and emphasizes that these strong personal relationships are what allows him to distribute up to 550 tons of food a year. He does not receive any official financial support but BRING transport lets him use a big storage space

and their transport fleet for free. This allows him to send food as far as to Oslo when they are able to. The other individual who acts as a “middle man” in this system is located in Drammen. His name is Bjarne Halvorsen and he is the leader of the organization “Narkomisjonen”, an organization that provides support to drug addicts. He picks up surplus food from different stores and distributes it to different charities and drug users in the streets around Busekud, Vestfold, Telemark and Østfold.

A complete list of all the charities included in this study, organized by city, is found on the Appendix 7.3.

The actors participating in direct redistribution in the Norwegian cities included in this study interact in different ways. Most organizations have more than one donor of surplus food that they rely on. The exception to this is The Fountain House in Bergen, The Church City Mission’s soup kitchen in Drammen, The Crux follow-up center in Sandnes and The Church City Mission in Tromsø, who only have one source of surplus food supply. Most of the times charities have one or two regular suppliers and other occasional suppliers that they also collaborate with. Whatever the number of suppliers, charities seem to have very strong and close relationship with them. This allows, among other things, reliability, with both suppliers and those picking up the food knowing exactly when that happens. This is very important because it allows charities to offer regular food services and makes sure that suppliers do not end up saving surplus food for someone that will never come pick it up, disturbing their own internal routines.

In average, organizations pick up surplus food from suppliers two to three times a week although there are organizations that pick up surplus food only once a month (For example, The Church City Mission’s Work Training in Fredrikstad) and organizations that pick up surplus food as often as every day (For example The Church City Mission Soup Kitchen in Drammen). This depends on the type of food service offered at each organization and the type of storage that organizations have access to. The job of picking up the surplus food from suppliers is up to the volunteers of each organization and is done either individually or in teams. Only 9 out of the 53 organizations included in this study have their own car, in most cases volunteers use their own vehicles with only some of them receiving a refund for their expenses. In many cases the collection of the food is done by foot or by bicycle, such is the case of the Robin Hood House in Bergen or the People’s Kitchen in Tromsø.

In a few cases, the suppliers deliver the surplus food to the charities. That is the case of for example The Northern Church in Drammen, which receives food from the organization



Narkomisjonen, as well as The Salvation Army in Moss, which receives food from the Oslo Food Bank once a month (with the support of the transport provided by Fretex). Local bakeries deliver bread to, for example, the Red Cross in Sandefjord and The Diaconal Center in Skien. In Tromsø, REMA1000 delivers food to Virkelig street magazine almost every day.

The organization Sammen om nøden (SoN) owns its own storage in Grimstad and distributes the food among its 14 centers on its own transport fleet. Three of those centers are included in this study (Sandefjord, Kristiansand and Bergen).

With regards to the facilities at the charities, more than half of them (35) have access to storage space but unfortunately, this is in many cases limited. This is the case of for example The Robin Hood House in Bergen, The Church City mission Soup kitchen, in Drammen, The Fountain House in Bergen and Virkelig in Tromsø. The only charities that do not have access to storage space were found in Drammen, where neither Northern Church nor The Blue Cross have the capacity to store food for later use. This said, there was in each city studied at least one charity with large storage capacity. In addition, out of the 53 organizations included in this study, 43 had access to a freezer and 30 to a fridge. A table illustrating the resources available in each city is found on Appendix 7.7

Most charities are organized very well. Routines are clear and so are the roles of those working in the system. More than 550 people participate in the picking up, storing, packing, cooking and serving of the food in the 10 cities studied of which only 42 of them are employed by the organization and receive a salary. In only a few cases, the employees are exclusive to this activity, most of them have other main responsibilities around the organization. A table illustrating the total amount of people working in direct redistribution in the cities included in this study, by type of worker (volunteer/employee/trainee) is available on Appendix 7.6.

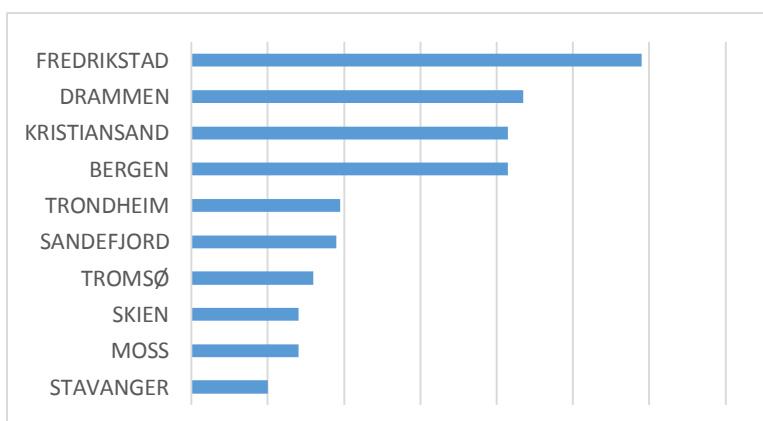


Figure 5: Direct redistribution in Norway. Number of volunteers working in direct redistribution in ten cities in Norway

There is an average of 11 volunteers working in picking up, storing, packing, cooking and serving surplus food in each of the charities included in this study. There are significant differences in the number of volunteers at each organization, though. Some have as little as

one volunteer, such as at the Social medicinal center in Sandefjord, while others have as many as 50, such as at The Blue Cross Soup kitchen in Fredrikstad. Figure 5 illustrates the total number of volunteers per city.

Sometimes students or trainees participate in direct redistribution too. Such is the case of autistic students from a school in Drammen, who pick up the food from suppliers and deliver it to The Salvation Army, or cooking students from Fredrikstad who prepare the meals at Café Britannia.

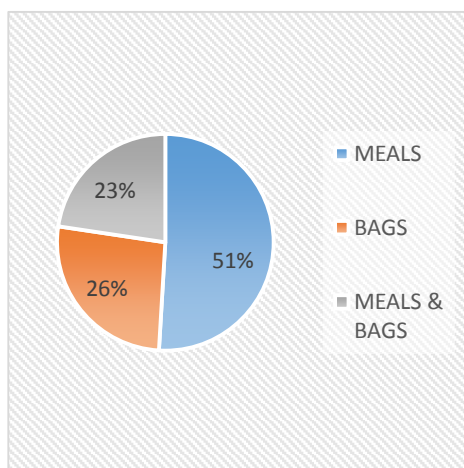


Figure 6: Direct redistribution in Norway. Food services sourced with surplus food

Surplus food obtained by the charities is used to prepare meals and/or to give out bags of groceries. Prepared meals are served at soup kitchens, shelters and other social services aimed at addicts, homeless, victims of domestic abuse or poverty, but also at Cafes run by charity organizations and opened to the general public. Preparing meals is the most popular way to use surplus food in the cities included in this study with 74% of the charities using surplus food to make either breakfast, lunch or dinner. An overview of the incidence of each service is illustrated on Figure 6.

The soup kitchens included in this study are mostly for drug and alcohol addicts, although homeless and immigrants are also welcomed. The shelters included in this study are spaces where people in need can live in, usually aimed at homeless, addicts or victims of domestic violence. Other social services using surplus food to make meals include The Church City Mission's work training program and the Crux follow-up center in Sandness.

There are also three Cafes using surplus food in their meals. These Cafes are Café Britannia in Fredrikstad, The Church City Mission's Café in Kristiansand and Café Magdalena in Bergen, all three are run by the organization The Church City Mission. These cafes offer low-cost meals and are open to the general public. Workers at the cafes are volunteers, students and apprentices. Those that work at the cafes eat for free.

Most of the ingredients used to prepare these meals come from the surplus food received from local suppliers, but sometimes kitchens have to buy additional food such as salt, butter, tea, cooking oil, etc. The amount of surplus food used for the food services varies among the different organizations and depends on surplus food supply. Many of the charities manage to

source their food services entirely from surplus food, but there are some that have to buy a good part of the food.

The other way to redistribute surplus food through charities is by giving out bags of groceries. Most organizations give out pre-packed bags, but some allow people to come in and take what they prefer. When giving pre-packed bags, volunteers receive the surplus food (usually from other volunteers) and organize it in categories such as Dairy, Meat, Full meal, Vegetables, Bread, Drinks, etc. Then, they prepare bags containing a good balance of all the food categories. They also make special bags without pork for Muslims. When people can choose what they prefer to have, they are usually welcomed (one at the time) into a space where they can either point at or pick up the food themselves. Many volunteers interviewed for this study reported that pre-packed bags was a quicker way to give out food, but personalized bags - a process that required more time - avoided people taking food with them that they would maybe not end up consuming.

Many charities (23%) offer both meals and bags of groceries. Sometimes, this takes place at the same time, such as at the Open House in Fredrikstad where those having a meal can also take food products from a table placed by the kitchen. Some other times, meals and bags are offered on different days, such is the case of the Son Center in Sandefjord that serves a free meal every day but offers bags of groceries just once a week.

Most cities included in this study host some sort of free food service every day, whether it is warm meal, a cafe or grocery bags, This is a result of the cooperation between the charities that schedule their services with each other in order to cover as many days of the week as possible together. The only exception to this occur in Moss and Trondheim, where free food is only available 3 to 4 times a week. In Moss, this is a recent situation since “Kontaktene” Cafe used to serve a free meal every day until it was closed down recently. In Trondheim, there is actually free food available every day, but the organization providing it (The Church City mission) buys all the food they serve. Nevertheless, they are in the process of establishing an agreement with KIWI to get their surplus food. Recently the establishment of a food bank in Trondheim was also discussed (Opland, 2015)

In general, the food is often of great quality. Most of the people eating at the food services would usually not be able to afford some of the expensive food served at the soup kitchens or shelters and is received as a “luxury”. Volunteers consulted for this study agreed that food was usually more than enough but that there was not always much variety. Sometimes they received

many units of the same product and struggled to allocate them among the users of the charity food services. Unfortunately, there is not a very large amount of fresh foods such as fruits and vegetables while there is a considerable volume of processed food.

There does not seem to be much cooperation among the charities. Only a few of them reported calling other local charities if they received too much food, but this did not seem to happen very often. In a few cases, charities that belonged to the same organization, shared a common storage facility, which functioned as a food bank. This is the case of The Salvation Army in Skien and Porsgrunn, the soup kitchens run by SoN and the Blue Cross' Children station, Crisis Center, Shelter and Soup Kitchen in Fredrikstad. These arrangements delegate the task of going around to the different suppliers and storing the food to their umbrella organization, alleviating some of the work of the local charities.

There seems to be very little food waste at the charities using surplus food in their food services. *“Most of the food that comes in, comes out”* was reported by several people working at the charities. When charities receive food close to its expiration day, most of them are able to freeze it and use within a few months. This is a way to have “back up” food in case one day they do not receive enough surplus food for their food services, as well as to stretch the time as much as possible to use the food before it becomes food waste. This said, sometimes suppliers donate a large quantity of a same product, making it very hard, especially for charities using the surplus food in meal services, to use all of the food received.

### 3.2. SOCIAL ASPECTS

The relationship between the volunteers at the charities and the users of the food services is very important and illustrates that the food services at the organizations are much more than the providing of food. The food services are a means to an end. Food is an “excuse” to reach out to people who need help. Meals function as a space to gather and find support. Many of the volunteers working at these meals reported that having daily, weekly or bi-weekly food services allow them to informally follow up on people suffering of, for example, substance addiction, making sure they eat enough nutritional food and keep themselves relatively healthy. It is not strange to find one or two volunteers assigned to the dining room or waiting area to chat with the people using the food services.

This intention is seen through the very welcoming spaces where the food services take place. Volunteers emphasize the importance of offering a space where users can eat or pick up food with dignity and discretion. Most of the spaces include modern dining areas where a meal can be enjoyed, such as at The Salvation Army in Stavanger. Some others have comfortable living-room areas where people can enjoy a coffee and sometimes cake or pastries while waiting for their turn to pick up food, as at The Salvation Army in Drammen. These spaces function as a meeting places for social and emotional support. Often, volunteers help people with things unrelated to food acquisition, such as sharing work tips or helping them with administrative tasks when they do not speak Norwegian. Moreover, volunteers can refer people using the food services to other social support services offered by the organization, such as free showers, addiction rehabilitation programs or even tickets for a family film that the charity received as a donation from the local theatre.

While some of the volunteers are trained as social workers, many other relate to the users from their own experience, having been in difficult situations before themselves.

Although this study on direct redistribution in Norway did not include interviews with soup kitchen or shelter users, the researcher was often able to have informal conversations with users while waiting for her interviews with representatives of the organizations. During these informal chats, users emphasized the value of counting on a space where they felt respected and accepted and where they could, besides accessing food and other basic services, meet other people, talk about their problems and find emotional support.

The efforts to provide a welcoming and comfortable experience for those accessing the food services are also seen through the quality of the meals offered. The volunteers making the food are usually experienced in dealing with the uncertainty of surplus food supply and seem to work hard in making the best food as possible.

Unfortunately, in spite of the efforts to make the users of the food services feel welcomed, many of the interviewees emphasized the challenge of social stigmatization. Several people volunteering at the food services included in this study felt that many more could benefit from their food services if they did not feel so embarrassed to come get free food. During informal conversations about the topic, volunteers agreed that social cafes allowed more discretion but that those that did not have any money to access food were left with other food services such as soup kitchens, where they felt more exposed as recipients of social help. None of the interviewees were able to offer any solutions to alleviate this situation.

### 3.3. FOOD RECOVERY

In total, the organizations included in this study reported to offer more than 24672 meals sourced with surplus food every week. Figure 7 illustrates the total amount of meals made with surplus every week, in each of the cities included in this study.

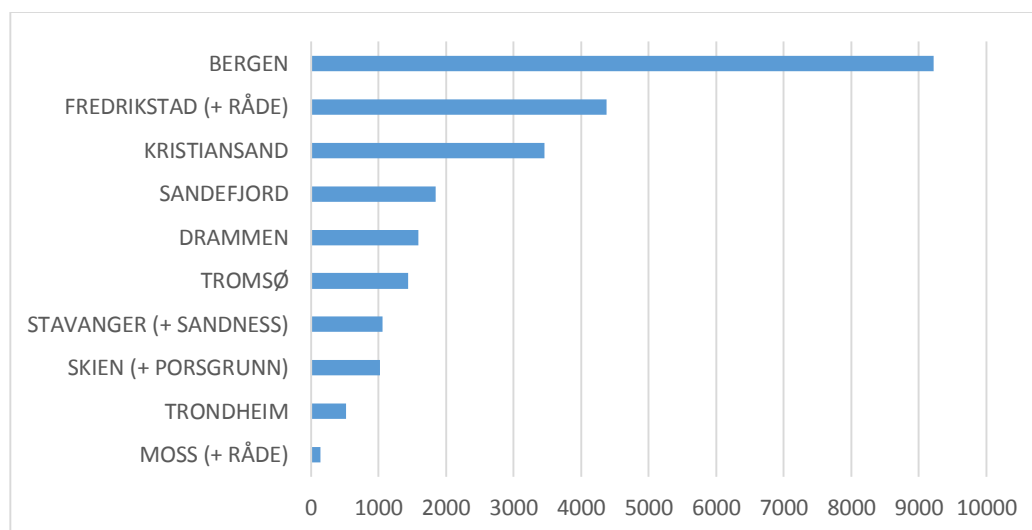


Figure 7: Direct redistribution. Meals served per week at the charity food services

Bergen, with eight charities using surplus food in their food services, is by far the most active city when it comes to surplus food redistribution. Fredrikstad and Kristiansand also redistribute a significant volume of surplus food through charity food services. Moss, on the other hand, is the city with the least amount of meals served every week with only 143 meals a week. Moss is also one of the cities where the least amount of charities participating in surplus food redistribution were identified.

There are interesting differences among the cities in regards to the way they use surplus food. Figure 8 illustrates that when comparing total amount of meals, Bergen takes the unarguable lead, leaving Fredrikstad clearly behind but when it comes to meals served, both cities present very similar values (Bergen 2020 and Fredrikstad 2274). Figures illustrating amount of food bags given by city, and amount of meals served by city are found on Appendix 7.3 and 7.4 respectively.

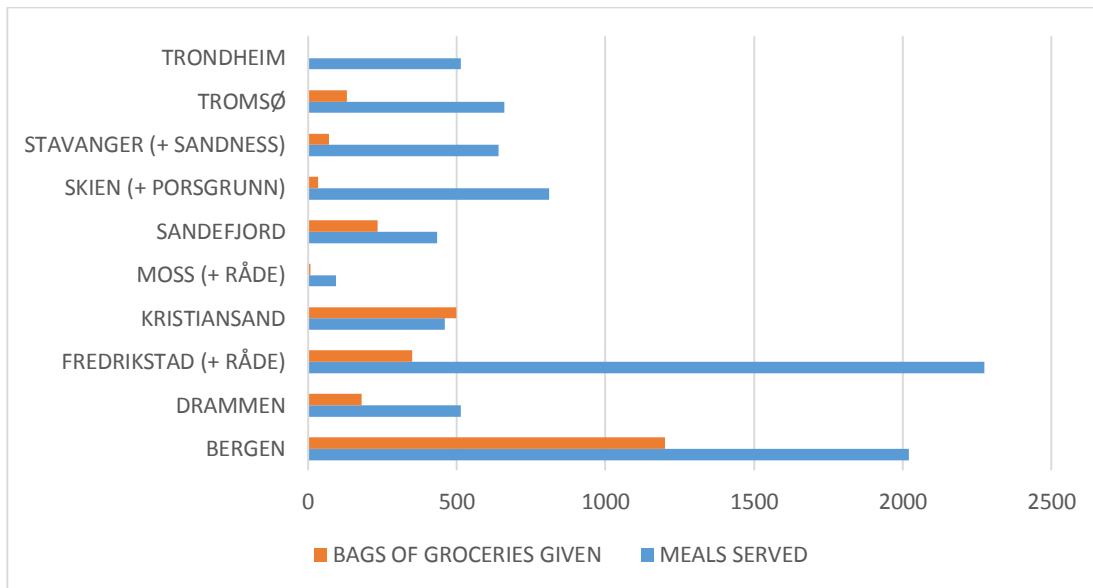


Figure 8: Direct redistribution in Norway. Food bags given per week at the charity food services

## 4. DISCUSSION

Direct redistribution in the cities included in this study is complex but well organized. The fact that the actors that partake in national agreements are more active than those that do not, suggests that formal agreements between national suppliers and national charities, are a strong element in the success of direct redistribution.

Direct redistribution requires a significant amount of work force. In Norway, the people working in direct redistribution are mostly volunteers from the charities using surplus food in their food services. Although this works well, the incorporation of other sources of work force could alleviate some of the hard work volunteers from the charities currently do. Some of the charities included in this study collaborate with local schools and delegate the work of picking up and taking the food to the charity to students. This results in a very good solution for both the charities and students. Volunteers at charities can focus on food preparation, serving and social support and student can gain a precious experience through social work. Studies on community service as part of student interventions have proven to foster values development, encourage responsible citizenship (Delve et al., 2006), encourage life changes (Ozorak, 2013) and stimulate reflection on society (Yates, 1995). In Colombia, University students also participate in surplus food redistribution, in this case by providing nutritional analysis and logistical planning to food banks (Schneider, 2012).

The results show that there is very little cooperation among the charities included in this study. While most of them seem to be doing well regardless of this, a greater degree of collaboration could bring many benefits. If several charities shared a common storage, for example, they would be able to accept more food from suppliers and reduce some of the workload, since it would be distributed among the charities shearing the storage. Cooperation between the charities could also potentially contribute to reduce food waste from the surplus food redistribution itself. As mentioned previously, on several occasions the charities are not able to use all of the surplus food received because it contains too many units of the same product. This is a problem also reported on studies on indirect redistribution (Alexander & Smaje, 2008). Sharing a storage with other charities could facilitate a more efficient distribution of the surplus food available. Last, most charities reported not having their own vehicle to pick up the food so another way to benefit from collaboration could be shearing a car or a van together. The results show that there is at least 20 volunteers actively involved with surplus food redistribution and one storage space, freezer and car in each of the cities consulted. This suggests that there are already enough resources and facilities to organize a cooperation among the charities. This could allow charities that are currently not able to access so much food, to be able to increase their participation in direct redistribution.

Although the quality of the food is very good, there was an evident lack of fruits and vegetables. This is certainly related to the fact that none of the charities reported receiving surplus food from farmers and very few received surplus food from distributors that carry fruits and vegetables. Another benefit of being able to accept more food through the cooperation of several charities is the potential to include more suppliers such as farmers and distributors of fruits and vegetables, who usually discard of larger volumes of surplus food than supermarkets.

The personal relationship of volunteers with suppliers is very important. It contributes to the efficiency of the routines and maintains agreements over time. Nevertheless, it is important that the relationship between the suppliers and the charities does not depend on personal relationships only. A considerate amount of surplus food redistribution depends on just one person in both Drammen and Trondheim. These two people work as intermediaries between the suppliers and charities, by distributing and storing the surplus food. More collaboration with for example, the volunteers of the charities, could alleviate some of the hard work they both currently do.



The relationship between volunteers and those using the food services is also crucial, with the food being just an excuse to facilitate that relationship. Tarasuk & Eakin had already referred to charity food services as essentially a symbolic gesture (Tarasuk & Eakin, 2003) and Wicks (2006) had already claim that social interaction was an important motivator of attendance to soup kitchens (Wicks, 2006). These studies from Australia and Canada, together with the results from this study on Norwegian direct redistribution, suggest that charity food services in richer countries deal with issues associated to relative poverty, such as emotional support, while poorer countries deal with issues related to absolute poverty such as hunger (Godoy et al., 2014). In the Norwegian charities included in this study, the main objective seems to be helping people struggling with addictions. Previous studies have shown that soup kitchens are indeed prime locations for outreach to people suffering from substance addiction (Magura et al., 2000) and Norwegian studies have also addressed the topic. Immigrants and substance abusers were found to be the largest groups in need of food support in Norway. In a study about nutrition and health of drug addicts in Oslo, it was reported that up to 30% of them suffered from malnutrition, with cases of moderate and severe underweight among women (Saeland et al., 2009). The same study showed that 40% of the addicts never prepared a hot meal and 6% of them had not eaten anything in the previous 24 hours (Saeland et al., 2009). In another study, done by the same team, a few year later, the researchers also found out that a 34 percent of the drug addicts consulted had limited access to food, mainly because of the lack of money (Sæland et al., 2011). Considering that, charities would not be able to offer food services without the access to free surplus food, and the relevance of the charity food services in regards to social support, the importance of direct redistribution is indisputably significant.

Although charity food services have many positive aspects, the issue of stigmatization is still a problem. Lorenz, on a study on German food banks, claimed that charity food services such as soup kitchens or food banks, actually contributed more to social exclusion rather than alleviating it (Lorenz, 2012). This was a recurrent topic in the conversations with volunteers, and a challenge they struggled with every day. Social cafes such a Café Britannia in Fredrikstad or Café Magdalena in Bergen, where users can access a meal for a low price or volunteer at the organization in exchange for a free meal, seem to allow more discretion and privacy and overcome the risk of contributing even more to social exclusion. Nevertheless, those that cannot access a social café still suffer from the stigmatization of using social services such as food banks or free food bags and further research on the potential of other strategies such as for example, social supermarkets, should be explored in the future.

As described in the introduction part, several studies have already shown that indirect redistribution is a valid and efficient approach to reduce food waste. With more than 1 million meals made with surplus food every year, this study shows that direct redistribution, is also a valid and efficient approach to reduce food waste. To my knowledge, this is the first study that includes all charities using surplus food across ten cities in Norway. The only previous data on volume of surplus food being redistributed in Norway is from the report on “*Food redistribution in the Nordic region*” by The Nordic Council (Hansen et al., 2015) and only included three cities, without including all of the charities using surplus food in each of them. Nevertheless, the figures of both studies are very similar. While the report from The Nordic Council reports that between 70000 and 10000 meals are redistributed through direct redistribution Fredrikstad, Kristiansand and Trondheim every week, my study on Direct Surplus Food Redistribution in 10 cities of Norway indicate that those same three cities serve approximately 8000 meals every week. It is important to remember that these figures were obtained from official data at the charities consulted and that for more accurate figures, studies quantifying the surplus food being redistributed by weight, are needed. Nevertheless, the figures give a good idea of the volume of surplus food being redistributed in Norway.

The potential of expansion of direct surplus food redistribution depends on the availability of surplus food. While mapping the situation of surplus food redistribution in the cities to be included in this study, several organizations offering food services, but currently buying the food instead of sourcing it from surplus food donations were identified. This suggests that there is a potential to use even more surplus food in charity food services as long as more surplus food is available from suppliers. In order to set limits to the scope of this study, the suppliers of surplus food in the cities included in this study were not explored, so it is not known how much more surplus food is available for redistribution exactly . Further studies should explore the regional flows of the food supply in order to identify potential donors that could participate in surplus food redistribution.

This study focused on logistic and social implications of direct redistribution only. Besides quantitative studies to obtain more exact data of volume of surplus food being redistributed and potential surplus food available, studies addressing economic and institutional aspects should also be done in the future.

## 5. CONCLUSION

The objective of this study has been to discuss the main aspects of direct redistribution in Norway by exploring the logistics, embedded social relationships and volume of surplus food rescued from becoming food waste.

The logistics of direct redistribution in the cities included in this study are complex, efficient and supported by national agreements between suppliers and charity organizations. This facilitates the distribution of 3500 meals made with surplus ingredients, every day.

Direct redistribution is heavily dependent on volunteers and their personal relationships with the suppliers. Although these aspects contribute to social and community development, by incorporating students to the work force and cooperation among the different charities, it should be possible to alleviate some of the workload of the current logistics. Cooperation between charities and local and/or Governments could also potentially incorporate more donors of surplus food and contribute to a more balance distribution of surplus food among the charities.

The results from this study suggest that current surplus food redistribution in the cities included in this study make a significant contribution to food waste reduction and that surplus food redistribution should be considered as a strategy to reduce food waste.

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## 7. APPENDIXES

### 7.1 DIRECT REDISTRIBUTION IN NORWAY. INTERVIEW QUESTION

Which stores do you pick up food from?

How many people are involved in the picking up of the food?

What kind of transport do you use to pick up the food? (Private/organization's/etc)

Do you have a storage/freezer?

How many people are involved in the sorting and giving out/serving of the food?

How do you use this food? (Serving meals/ Giving out grocery bags)

Do you buy any food to complement what you receive for free from the stores?

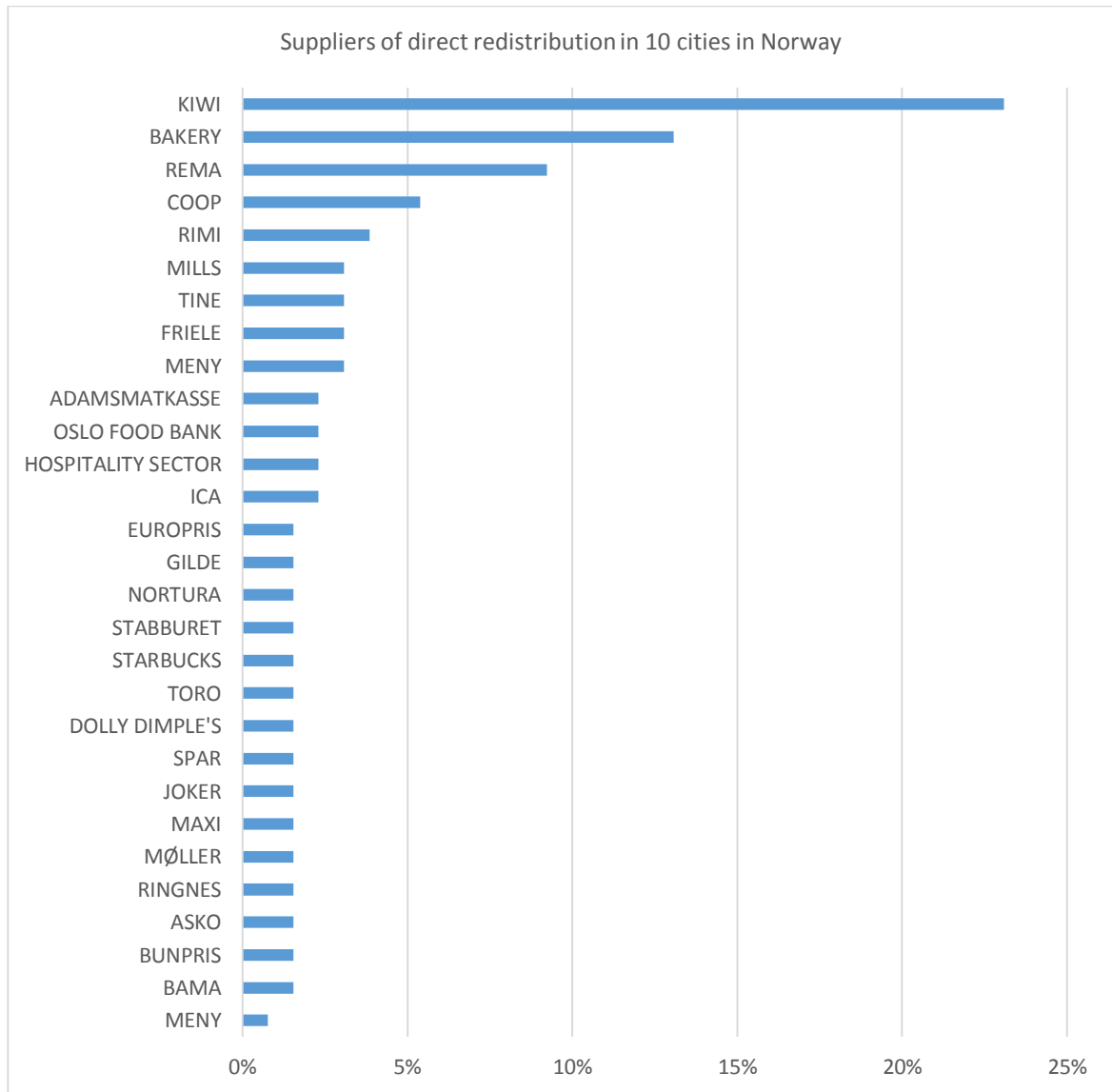
What kind of people come pick up free grocery bags/ eat a free meal?

How many people come pick up free grocery bags/ eat a free meal?

Do you collaborate with any other organizations in regards to the picking up/storing/etc?

If you could think of any improvements of the current system, what would that be?

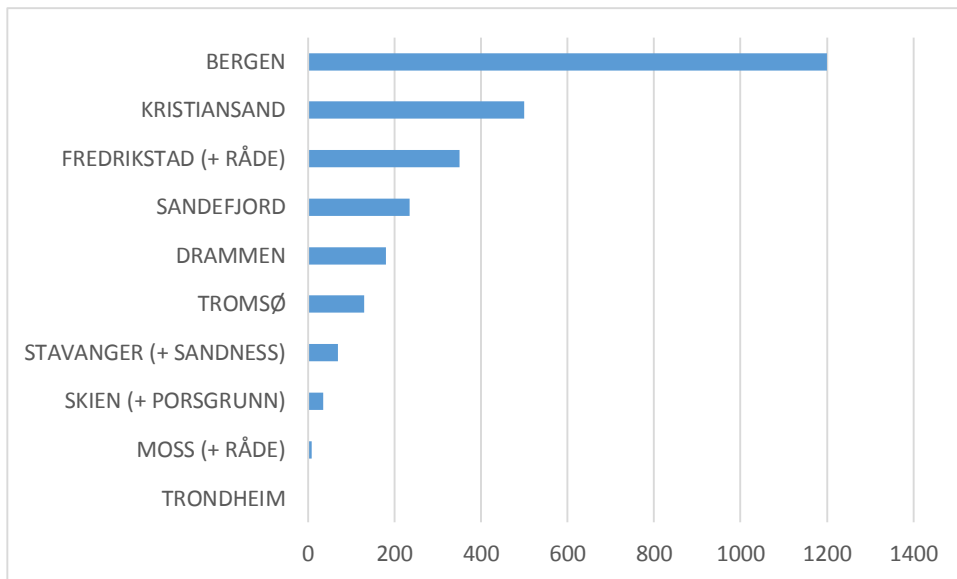
7.2. DIRECT REDISTRIBUTION IN NORWAY. SUPPLIERS OF SURPLUS FOOD PER PERCENTAGE OF PARTICIPATION



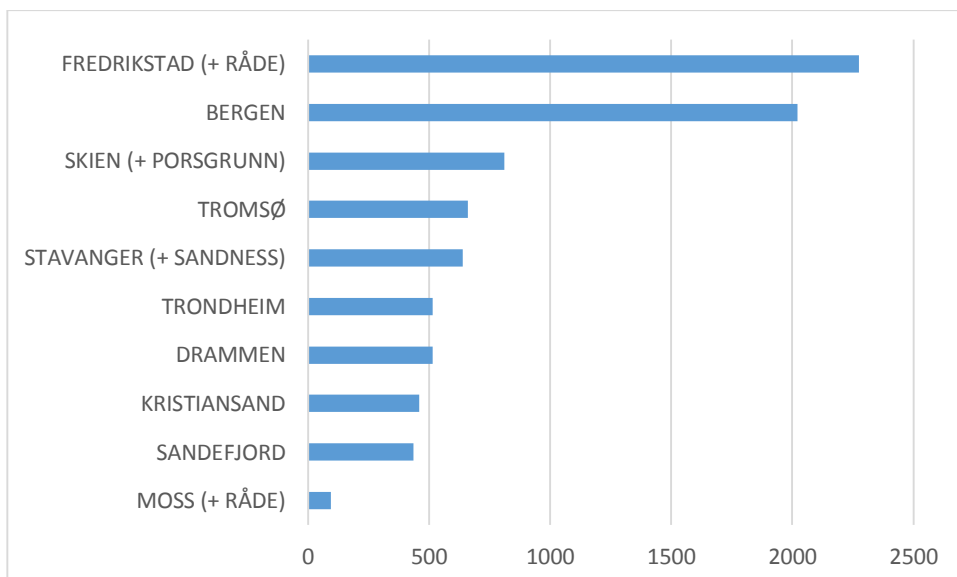
### 7.3 DIRECT REDISTRIBUTION IN NORWAY. CHARITIES RECEIVING SURPLUS FOOD PER CITY

CITY	CHARITY
<b>BERGEN</b>	The Blue Cross
	The Church City Mission's church
	The Church City Mission's Cafe Magdalena
	The Church City Missions shelter
	The Robin Hood House
	The Salvation Army shelter
	"SoN" Center
	The Fontana House
<b>DRAMMEN</b>	The Northen Church
	The Salvation Army
	The Church City Mission's Activitiy café
	The Church City Mission's shelter
	The Blue Cross
<b>FREDRIKSTAD</b>	The Church City Mission's Café Britannia
	The Church City mission's work training
	The Blue Cross shelter
	The Blue Cross Shelter (in Råde)
	The Blue Cross children's station
	The Blue Cross' Crisis Center
	The Blue Cross Shelter (Sarpsborg)
	The Blue Cross Shelter (Ilaveien)
	The Salvation Army (Torp)
	The open House
<b>KRISTIANSAND</b>	"SoN" Center
	The Salvation Army
	The Church City Mission's café
	The Free Church
	The Philadelphia Church
<b>MOSS</b>	AEF Shelter
	The Salvation Army
	Sion congregation (Råde)
<b>SANDEFJORD</b>	The Blue Cross
	Vintreet Congregation
	The Salvation Army
	SoN Center
	Social medicinal center
	The Red Cross
<b>SKIEN</b>	The Salvation Army
	Diaconal Center
	SoN Center (Porsgrunn)
	The Salvation Army Porsgrunn
<b>STAVANGER</b>	The Salvation Army
	Crux follow-up center (Sandnes)
	The Church City Mission
<b>TROMSØ</b>	The Church City Mission
	Cafe 103
	Virkelig Street Magazine
	The Salvation Army
	Cafe X
	The people's café
<b>TRONDHEIM</b>	Social café
	The Salvation Army
	The People's Café

#### 7.4. DIRECT REDISTRIBUTION IN NORWAY. FOOD BAGS GIVEN PER WEEK BY CITY



#### 7.5. DIRECT REDISTRIBUTION IN NORWAY. MEALS SERVED PER WEEK AT SOUP KITCHENS, SHELTERS AND OTHERS BY CITY



7.6. DIRECT REDISTRIBUTION IN NORWAY. PEOPLE WORKING IN DIRECT REDISTRIBUTION BY TYPE OF WORKER

CITY	EMPLOYEES	TRAINEES	VOLUNTEERS	TOTAL
BERGEN	23	5	83	111
DRAMMEN	2		87	89
FREDRIKSTAD	6	7	118	131
KRISTIANSAND			83	83
MOSS	1		28	29
SANDEFJORD			38	38
SKIEN	2		28	30
STAVANGER			20	20
TROMSØ	8		32	40
TRONDHEIM			39	39
TOTAL	42	12	556	610

7.7. DIRECT REDISTRIBUTION IN NORWAY. RESOURCES AVAILABLE BY TYPE OF RESOURCE

	FRIDGE	FREEZER	CAR	STORAGE
BERGEN	5	8	2	4
DRAMMEN	1	3	2	3
FREDRIKSTAD	8	10	1	10
KRISTIANSAND	4	5	0	4
MOSS	3	3	1	2
SANDEFJORD	1	5	0	5
SKIEN	3	4	0	2
STAVANGER	2	3	1	
TRØMSO	1	4	1	2
TRONDHEIM	2	2	1	2



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